The Influence of an Innovative Hospice Design and Care Model on Wellbeing

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Declaration

This thesis is the result of the author's original research. It has been composed by the author and has not been previously submitted for examination which has led to the award of a degree.

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Abstract

The impact of healthcare design on wellbeing can be overlooked due to the prioritisation of clinical efficiencies and medical advancement. Although important, palliative care emphasises adopting a multifactorial person-centred approach, placing the person, rather than the illness, at the centre of care. An opportunity for this research study to explore the importance of humanising architecture arose with the relocation of The Prince & Princess of Wales Hospice to a new purpose-built facility. A mixed-methods case study methodology determined the relationship between the design of the environment and its impact on people's wellbeing. This was achieved by developing a novel Hospice POE Toolkit focused on person-centred outcomes. This toolkit was informed by a theoretical framework based on literature drawn from wellbeing and healthcare evidence-based design. This study aimed to determine the wellbeing benefits experienced by patients, family, friends, staff, and volunteers at the hospice. People participated across multiple research methods, including semi-structured interviews, focus groups, and surveys. Additional research methods included quantitative environmental monitoring, measuring indoor air quality, noise levels and walking distances.

The study findings reach beyond the confinements of its immediate architectural discipline to psychology, science, and healthcare. A common thread throughout the findings and discussions - and arguably incorporated into the very foundation of the study– was an emphasis on the importance of people; their connection, engagement, value and resilience. The outcomes of this study have implications for both policy and design, particularly as preventative and non-clinical approaches are becoming more prevalent within healthcare.

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Abbreviations

AEDET	Achieving Excellence Design Evaluation Toolkit
AHP	Allied Healthcare Professional
AI	Appreciative Inquiry
ARB	Architects Registration Board
ART	Attention restoration theory
ASPECT	A Staff and Patient Environment Calibration Tool
BIM	Building Information Modelling
BPE	Building performance evaluation
BPRU	Building Performance Research Unit
BREEAM	British Research Establishment Environment Assessment Methodology
BRMG	Building research monitoring group
BSJ	Building Services Journal
BUS	Building Use Studies
CBE	Center for the Built Environment
CEO	Chief Executive Officer
CI	Chief investigator
CO	Carbon monoxide
CO2	Carbon dioxide
DALYS	Disability-adjusted life years
DEC	Departmental ethics committee
DMP	Data management plan
DQI	Design quality indicator
DSR	Domestic service room
EARMTM	Energy Assessment and Reporting Method's
EBD	Evidence-based design
EDRA	Environmental Design Research Association
EDRA	Environmental Design Research Association
EoL	End of life
EPSRC	Engineering and Physical Sciences Research Council
EVOLVE	Evaluation of Older People's Living Environments
GT	Grounded theory
HBE	Healing built environment
HCA	Healthcare Assistant
HCAHPS	Hospital Consumer Assessment of Healthcare Providers and Systems
HEAP	Hospice Environmental Assessment Protocol
HIS	Healthcare Improvement Scotland
HSE	Health and Safety Executive
IAPS	International Association People-Environment Studies

IAQ	Indoor air quality
IEQ	Indoor environmental quality
IEQ	Indoor Environmental Quality
IPOS	Integrated palliative care outcome scale
IPS	Indoor positioning systems
IPU	Inpatient unit
IRAS	Integrated research application system
LEED	Leadership in Energy and Environmental Design
MMR	Mixed methods research
MND	Motor neuron disease
NHS	National health services
OACC	Outcome Assessment and Complexity Collaborative
OAM	Office assessment method
PAC	Pre-application consultation
PEAP	Professional Environmental Assessment Protocol
PHEQIs	Perceived Hospital Environment Quality Indicators
PIS	Participant information sheet
POE	Post-occupancy evaluation
POS	Palliative care outcome scale
POW	Plan of Work
PPWH	The Prince & Princess of Wales Hospice
PRISMA	Preferred Reporting Items for Systematic reviews and Meta-Analyses
PROBE	Post-Occupancy Review of Buildings and their Engineering
PROBE	Post-Occupancy Review of Buildings and their Engineering
PROMS	Patient-reported outcome measures
PVG	Protecting vulnerable group's scheme
PVQ	Pre-visit questionnaire
QoL	Quality of life
RCT	Randomised controlled trial
RH	Relative humidity
RIBA	Royal Institute of British Architects
RKES	Research & Knowledge Exchange Services
SCEAM	Sheffield Care Environment Assessment Matrix
SLM	Sound level meter
SSA	Space syntax analysis
UEC	University Ethics Committee
UKRI	UK Research and Innovation
UoS	University of Strathclyde
VOCs	Volatile organic compounds
WHO	World Health Organisation

Contents

Chapter 1
Introduction

This chapter introduces the origins and focus of the study, providing a brief background and placing the motivation for the work into context. After that, the rationale is briefly discussed with an outline of aims, objectives, and research questions, followed by accentuating the significance of the research and its contribution to new knowledge within the realm of evidence-based design. Finally, a structural outline, given on a per-chapter basis, concludes and provides a concise overview of the rest of the thesis.

1.1 Origins of the Study

The Prince & Princess of Wales Hospice (PPWH) has provided care and support to the people of Glasgow (Scotland) and surrounding areas with life-limiting conditions and their families since the 1980s. Since becoming a registered charity in 1984, these services have responded to the community's needs and grown organically over the last four decades. The journey began with a volunteer-led telephone support line in 1985, followed by the establishment of day services in 1986 and the expansion into outpatient and community services in 1987. This growth trajectory ultimately led to creation of a fourteen-bed inpatient unit in 2002. The hospice now supports over 1200 patients and families annually (The Prince & Princess of Wales Hospice, 2019). Carlton Place was the first home for the services; two Georgian townhouses overlooking the river Clyde were gifted to the charity by Glasgow City Council in the late 1980s (The Prince & Princess of Wales Hospice). Over the years, the building had been adapted multiple times and grown to include two adjoining

townhouses. The services run within the building are the inpatient unit (IPU), day services, outpatient clinic and family support services. These services have dedicated areas within the building, supported by specialist staff and volunteers.

Along with these services, there are many non-patient-facing roles integral to the running and maintenance of the hospice. A more thorough description of services run within the building is explored in Chapter 8. As an organisation, they are entirely focused on providing person-centred care. This was evidenced by the consistently excellent assessments from Healthcare Improvement Scotland (HIS[1]).

Discussions with patients and families highlighted issues at Carlton Place, including a lack of privacy and challenges around accessibility and adaptability to suit specific needs, which research has shown to impact wellbeing. In response to this discussion, the organisation realised that they wanted to implement a drastic change, with PPWH Chief Executive Officer (CEO) and former Palliative Care Nurse Rhona Baillie stating, “the environment no longer supports our ambitions” (Baillie as cited in Priest, 2016). In 2010, the decision was taken to implement a challenging project: to design and construct a £21m purpose-built facility that would support high-quality care, cater to the community's growing needs, and have the flexibility for future adaptation. In 2012, the architects, working closely with the PPWH, undertook an extensive consultation process to develop the main aspirations for the project. Their new home in Bellahouston Park officially opened in late 2018; Baillie stated, “the design challenges healthcare traditions. It puts patients first and manages risk afterwards” (Priest, 2016). In a further article, Baillie identifies that “surroundings play a vital role in improving a patient's symptoms because, if you have anxiety, this can often heighten a patient's physical pain… If we can help to control that anxiety and make the patient feel more relaxed, in an environment, they are very comfortable in, then that can help their overall physical state” (Baillie as cited in Building Better

[1] Established in 2011, HIS deals with undertaking inspections of independent healthcare services within Scotland. Being responsible for the registration and regulation of these services; corroborated in the recent 2017 report where they scored “excellent” in 80% of criteria and “very good” for the remaining 20% (Healthcare Improvement Scotland, 2017)

Healthcare, 2016).

The relocation of the PPWH from its existing premises to a “new build” location provided the origins of this study. The organisation and architects were keen to document and share lessons learned from the new facility, particularly the impact of the Sengetun person-centred care model. Thus, this thesis came about, generously funded through UKRI, jointly by the PPWH and the Engineering and Physical Sciences Research Council (EPSRC).

1.2 Focus of Study: A Person-Centred Philosophy

With a brief introduction to the study's origin, the study's focus now comes into question. A mixed-methods case study methodology was developed to leverage the architectural design intentions against the operational outcomes, aiming to deliver new insights into and knowledge of evidence-based design (EBD). EBD emphasises the important influence environments have on people and their wellbeing. A desktop review of the project’s design and consultation documents showed that the final design and the process from “procurement” to “in use” was inherently person-centred. The project’s aspirations and achievements are deeply rooted within the PPWH person-centred organisational culture. Therefore, it seemed logical to adopt a similar approach for this research.

The theoretical framework of Chapters 2 and 3 was developed through a literature review of EBD healthcare and the influence environments can have on wellbeing. The conceptual framework of Chapter 4 was built on this initial research and expanded the scope into building evaluation studies, which directly informed the data collection process. The case study methodology provided the flexibility to allow the study to be driven through continuous co-creation with the PPWH on the direction and expected outcomes, as explored in Chapter 5. The overall aim was to determine the features of the PPWH environment that impacted wellbeing and therefore established a holistic person-centred environment for patients, family, friends, staff, and volunteers. This focused on the learnings from the person-centred Sengetun care

model, which will be introduced and explored in the following chapter.

1.3 Research Aims and Objectives

This study was initially conceived to produce a post-occupancy evaluation (POE) of the Sengetun care model and design process analysis. The project's remit was honed to focus on the person-centred aspects of POE after several site visits, discussions with staff and a literature review, these aspects being identified as weaknesses within existing POE methods. The research aims and objectives presented below were developed to explore this focus.

1.3.1 Research Aims

- The primary aim was to investigate the performance of the PPWH in achieving a person-centred environment, with person-centred aspects being defined by their impact on the wellbeing of patients, family, friends, staff, and volunteers.
- The secondary, but complementary aim, was to develop a new methodology to evaluate the environment in relation to occupant wellbeing.

1.3.2 Research Objectives

The objectives are divided into three distinct sections, the first exploring project management and development and the last two address the research aims.

Objectives For Project Management And Development

- Desktop review of project information to determine key aspirations for the project and identify potential focus areas.
- Informal observations and discussions with staff and volunteers concerning space use and interactions people have with these spaces and each other.
- Establishment of a Building research monitoring group (BRMG) to discuss and progress the aims of the study between the PPWH staff and the researcher.

Objectives For Determining Project "Person-Centred" Performance

- Review literature on hospices, healing environments, wellbeing, and EBD to identify gaps in guidance, knowledge or procedures.
- Evaluate the new facility utilising the building evaluation framework by conducting interviews, questionnaires, focus groups, and environmental monitoring.
- Analyse the data to identify key themes and present these as a contribution to the existing literature.
- Produce internal reports for the PPWH and disseminate findings to a wider audience.

Objectives For Developing the Building Evaluation Framework

- Review building evaluation methodologies and literature to describe measures currently used.
- Conduct a scooping review to identify relevant methodologies and extract their salient and discriminating practices and principles to allow for a comparative analysis.
- Establish a holistic methodology using quantitative and qualitative research methods to review building performance and assess how people use and perceive the environment.

1.4 Research Questions

The primary research questions are:

1. How do the design aspects of the Sengetun care model contribute to the establishment of a person-centred environment within the hospice inpatient unit?
2. What other environmental aspects of the hospice contribute towards facilitating a person-centred environment?

However, in order to evaluate person-centred features another research question

was formulated to aid in supporting the development of a systematic evaluation framework:

3. What methodologies are applicable to the measurement of the person-centred outcomes of a hospice environment focusing on wellbeing, and how can these be critiqued for their effectiveness?

1.5 Significance of the Study: A Person-Centred Future within Healthcare

The methodology was developed through close collaboration with the hospice organisation, with the primary goal of capturing and exploring the experience of patients, families, friends, staff, and volunteers. Patient-centred facilities are often challenging to measure and evaluate (Jensø and Haugen, 2005); therefore, this study employs a transdisciplinary approach to draw on research methods from multiple disciplines. Environmental monitoring methods add a quantitative layer of evidence to comprehensively evaluate the new facility. Although often site-specific, findings from this case study are discussed with generalisable aspects that can contribute to the person-centred EBD knowledge base and inform the design of future facilities.

Our physical environment impacts quality of life by influencing psychological and physical attributes (Cohen and Leis, 2019). A large body of evidence supports its impact on health and wellbeing (Ulrich *et al.*, 2004; Ulrich *et al.*, 2008). Extensive research by Ulrich *et al.* (2008) and Ulrich *et al.* (2004) explored environmental psychology and established links between the environment and human health and behaviour. In the words of Hoskins (2008: 8), “Our health and wellbeing is influenced by the environment we occupy, by physical factors such as air quality, noise, daylight and climate but also by psychological factors such as a perception of safety or of being valued … key to this is the way in which we experience a healthcare building – its initial impression, ease of access and the way it interacts with external spaces and nature”. A literature review by Salonen *et al.* (2013) documents various elements of the physical environment that affect health and wellbeing within healthcare facilities. Alvar Aalto's Paimio Sanatorium, Finland

(1928-1933), explored in Chapter 2, typifies that designing for human functioning, instead of medical advancements, allows the architecture to transcend advancements in medical technology and create a design viable in the long term; as the human is the one constant in architecture.

In architecture, empirical evidence can be generated from building evaluation studies; however, due to the long-standing divide between the sciences and other humanities subjects in architectural education, there is often a lack of focus on academic research skills. This can result in those in the profession being unable to evaluate to academic standards. Research findings are often only shared among a small group, with concern for the negative consequences of wider publication (RIBA *et al.*, 2017; Sharpe, 2018a; Stichler, 2016). Often, these studies focus on qualitative methods and can be multi-factorial owing to the nature of real-world projects. This is another barrier to inclusion in academic publishing because it is challenging to replicate or has a non-transparent research process. Many currently published studies focus on one aspect of wellbeing or patient outcome (Zhang, Tzortzopoulos and Kagioglou, 2018). This study, therefore, fuses scientific rigour with the building evaluation methodologies utilised currently to provide lessons learned that can apply both to academia and the field of architecture, thus allowing findings to be shared with the wider profession.

Three key aspects define quality in health care within the National Health Services (NHS): patient safety, clinical effectiveness and patient experience, a high-quality service combining all three (NHS England, 2014). The Five Years Forwards Report acknowledges that these standards are not always achieved, with “health inequalities deep-rooted” (NHS England, 2014: 3). One of the three critical areas of improvement identified for cancer outcomes within the report was “better treatment and care for all those diagnosed with cancer”, which should be applied across all age groups (NHS England, 2014: 37). Evidence shows a strong correlation between patient experience and quality of care in services, supported by specialised clinicians, facilities and equipment, and equality in care access and delivery. The report encourages the sharing and transparency of performance outcomes and the consolidation of cancer

treatments within specialist centres to ensure patients have access to a network of interconnected support services covering treatment, mental health, and social care. The report suggests developing new integrated care models to reduce the divide between often disparate healthcare services (NHS England, 2014). Zanon (2015), director of the NHS European Office, suggests that a new Swedish care model could be one answer, briefly outlined in the document. One benefit of implementing this Swedish healthcare model was a cultural shift from a provider-centred approach to a patient-centred one. This approach showed tremendous potential, with a 20% overall reduction in hospital admissions, hospital stays, and a reduction of more than 30 days waiting time for referrals (Zanon, 2015). However, given that most of these outcomes focus on hospital targets rather than human experience, developing innovative care models that will provide the best patient experience and value for money was required, looking both at the UK and internationally for best practice. However, innovation does not just happen; it is a process that must be rooted in measurable outcomes and encouraged and nurtured to succeed—often requiring a shift in culture and mindset. If rigorously evaluated and evidenced, new models could provide a precedent for future NHS healthcare facilities.

This study presented the unique opportunity to capture the experience of transitioning from a centralised unit with mostly multi-bedded accommodation towards a decentralised single-bedded one. The opportunity to focus on human experience and outcomes was evident in the PPWH. A notable inclusion, the Scandinavian Sengetun care model (meaning bed courtyard), was at the centre of this building evaluation study and highlights the benefits of integrating new models of care within the UK. It is a design and organisational model adapted for use within the inpatient unit, the first in the UK (The Prince & Princess of Wales Hospice, 2019). However, as this model was part of a holistic strategy for the entire facility to achieve a person-centred focus, it highlighted the need to document the facility in its entirety. This thesis produces empirical evidence to inform the medical planning of future hospital space with EBD. All design team members, medical and health planners, clinicians, trust management, and policymakers can use the findings to understand and inspire the future of person-centred healthcare environments.

1.6 Structure of Thesis

As this introduction concludes, it has set the scene for the proceeding chapters. This thesis has a narrative structure with relevant literature reviewed within each related chapter, mirroring the iterative approach taken throughout the research journey. Table 1-1 presents a schematic representation of the thesis objectives indicating how the chapters interrelate and provides an overview of the development of the study. The rest of this thesis is constructed of three interconnected sections that are organised as follows:

Table 1-1 Research map

Thesis Objectives	Methods	Outcomes
Establish research questions, aims and objectives	Informal discussions with PPWH staff Informal discussion and observation Desktop review Literature review Supervisor discussions	Chapter 1: study focus and desktop review related to the organisation. Chapter 2: literature related to hospices, palliative care, Sengetun care model, planetree philosophy and an introduction to EBD. Chapter 3: literature related to Ulrich (1991) Theory of Supportive Design and environmental factors influencing wellbeing. Chapter 4: literature related to building evaluation studies and tools, in addition to a scoping review. Chapter 2-4: developing a conceptual framework for research design.
Determine philosophical underpinnings	Literature review Informal discussion and observation	Chapter 6: involvement of the organisation. Chapter 5: research journey that established philosophical underpinnings. Chapter 8: observations and insight from the organisation.
Formulate methodology	Literature review	Chapter 4: literature used to determine methodology for the building evaluation. Chapter 5: philosophical underpinnings which influence the chosen methodology.
Conduct research	Interviews	Chapter 4: influenced research methods used.

	Surveys Focus groups Environmental monitoring Photographic documentation Informal discussions and observation Desktop review	Chapter 6: data collection considerations. Chapter 7: research methods for data collection.
Analyse research findings	Thematic analysis SPSS NVivo Google forms Specialised monitoring equipment programs Excel	Chapter 7: methods of analysis for each of the research methods.
Present research findings	Thesis chapters Organisation reports	All Chapters: thesis findings. Chapter 9: key themes identified from thematic analysis, triangulated through quantitative data.
Develop discussions and conclude	Critical analysis.	Chapter 10: reiterates the research questions and provides a critical analysis of findings in relation to existing literature. Chapter 11: analyses the research design and concludes with implications for practice and future research.

1.6.1 Section One

This first section contains a four-chapter discourse outlining the background, theoretical and contextual framework and the methodology underlying the overall thesis structure.

Chapter 2 (review of modern hospice movement and PPWH): Setting the foundations of the study, this chapter introduces the palliative care environment and philosophy behind the hospice movement. It explores the concept and significance of the healing environment, the adoption of the PPWH IPU Sengetun care model and its roots within the Planetree philosophy.

Chapter 3 (theoretical framework: evidence-based design): As a continuation of the previous chapter, it explores the existing literature. The concept of evidence-based design is introduced and, exploring the literature on the influence of the environment on wellbeing, structured around the work of Ulrich (1991) and his Theory of Supportive Design.

Chapter 4 (conceptual framework): This chapter is informed by a scoping literature review related to POEs in healthcare facilities. It explores the significance of building evaluation within the context of both academia and architectural practice. It culminates in the development of a Hospice POE Toolkit which summarises the conceptual framework, based on evidence presented in this and the proceeding chapters, to enable a holistic evaluation of the person-centred aspect of the PPWH.

Chapter 5 (methodology): This chapter discusses the interdisciplinary collaboration across architecture and healthcare research fields; as such, the methodology's theoretical underpinnings had to accommodate this. It explains the significance of the mixed methods case study methodology and details the researchers' philosophical positioning and underpinnings within the constructivist paradigm.

1.6.2 Section Two

This section bridges the gap between sections one and three, narrowing the focus of the study into the more detailed technical aspects used to gather the findings, ethical concerns, and complications of studies with vulnerable populations.

Chapter 6 (research design): This chapter introduces Creswell (2018) data collection circle and includes ethical considerations, sampling and recruitment, data collection and data analysis.

Chapter 7 (research methods): This chapter details research methods influenced by the POE Framework developed in the conceptual framework. Employing the mixed-methods case study approach by utilising quantitative and qualitative research methods to evaluate the PPWH environment holistically. The chapter concludes with how the data sets were analysed and the reliability and validity of the techniques.

1.6.3 Section Three

The last section presents key research findings in two illustrated chapters, detailing the PPWH building, key themes, and analysis of existing POE methodologies that informed the one used in this study. Finally, two chapters draw the thesis to a close, answering the research questions, exploring the research design, and concluding with implications for future research.

Chapter 8 (introduction to PPWH): Presenting the building by department and through floor plans and detailing the sample population.

Chapter 9 (findings): Presenting the three key themes of PPWH wellbeing; Fostering resilience, creating thoughtful focus, and engagement with holistic sensory experience. The findings focus on the qualitative data, with the related quantitative findings supporting it. This chapter concludes with the analysis of existing POE methodologies identified with a scoping review in Chapters 4 and how this translated into the final POE methodology used in this study.

Chapter 10 (discussion): Answering the research questions and providing a critical analysis of the findings in relation to the theoretical framework. In addition, performing a critical analysis of the research design.

Chapter 11 (conclusion): the concluding chapter documents limitations, presents the contribution to new knowledge, and discusses implications for practice and future research.

1.7 Conclusion

This introductory chapter provided an overview of the entire thesis. It presented the PPWH transition to its purpose-built facility as the origin and focus of this study and how this framed the research aims, objectives and questions. It highlighted the study's significance and its contribution to new research. The introduction concluded by presenting the main three sections used to structure the thesis and its associated chapters. It included all the key elements that influenced the development of the thesis, including, most importantly, the organisation itself and its role in shaping the

research. The following chapter explores the modern hospice movement, and EBD. Additionally, introducing the innovative hospice care model.

Chapter 2
Literature Review: Hospice, Healing, and Person-Centred Care

This chapter explores the evolution of the modern hospice movement. Then explores the role of innovative architecture in palliative care facilities, introducing the Maggie's Centres before exploring innovation in the PPWH by an introduction of the Sengetun care model to the UK and detailing its underlying roots in the Planetree philosophy. To further support the underlying research of this study it introduces the concept of healing environments, and evidence-based design (EBD); concluding with a discussion on the definition of wellbeing.

2.1 Strategy and Method of Searching the Literature

The literature review for this thesis was an iterative process, taking place throughout the research journey, forming a narrative review to inform the research questions, objectives, and theoretical and conceptual frameworks. Unlike a systematic review that can produce transparent and replicable results (Cook *et al.*, 1997), the narrative review offered a more flexible approach deeply rooted in the topic, a requirement for this thesis due to the close collaboration with the organisation under study. Databases were used for searching peer-reviewed literature, including Web of Science, Scopus, and Science Direct. Policies, reports, and other research studies were found through

grey literature searching, including Google Scholar and topic specific organisations such as the Department of Health, The World Health Organisation (WHO), Kings Fund, Public Health Scotland, Health Facilities Scotland, Hospice UK, The Center for Health Design, and HIS. This was supported through correspondence with researchers in the relevant fields, particularly from the PPWH research group. This combination of sources underpins the entire thesis and supports the academic rigour required to validate the strength of the research.

2.2 Palliative Care

2.2.1 Modern Hospice Movement

The provision of terminal care had no strategic or operational guidance with the 1948 establishment of the British NHS, not even being acknowledged as a clinical concern. At the time, the small number of UK hospices had little medical involvement and were not highly praised for their care standards, thus having minimal influence on wider healthcare policy or practice at that time (Clark, 1999a). The care was typically delivered by nuns or untrained nurses driven by "unselfish loyalty and overwork" (Clark, 1999a: 239). However, from the mid-20th century, a small dedicated group interested in terminal care facilities and associated charities, from researchers to clinicians, planting the seeds for new discourse around treating death and dying (Clark, 1999a). A handful of publications and reports arose, which identified a need for a shift in the care and treatment of the terminally ill (Clark, 1999a; Glaser and Strauss, 1965). This work led to the creation of the modern hospice movement, spearheaded by Dame Cicely Saunders: a nurse, a social worker, a physician, and the originator of the hospice model (Clark, 1999b; Storey, 1996; Verderber and Refuerzo, 2006). In its modern-day archetype, palliative care began to manifest itself during the 1960s and 1970s, with palliative medicine being recognised as a speciality in the UK only in 1987; Clark (2015: 7) stated it can "still be regarded as an emerging field of health and social care intervention, which continues to seek ways to integrate with wider systems and policy frameworks".

"Hospice" is a French word stemming from the Latin word "hospitum", which, from

different sources, translates to “hospitality”, “host”, or “guesthouse” (Moorhouse, 2006; Verderber and Refuerzo, 2006), encapsulating aspirations of this movement, as advocated by Saunders, “[y]ou matter because you are you, and you matter to the end of your life. We will do all we can not only to help you die peacefully, but also to live until you die.” (Clark, 2016: 351). Saunders coined the term “total pain”, encapsulating the physical, psychological, social, and spiritual issues faced by the terminally ill, which combine to produce tremendous distress. This became one of the cornerstones within the emergent field of terminal care, focusing on the importance of symptom management and an interdisciplinary team approach to meeting the needs of patients and families. The field rapidly gained international attention in 1967 after the opening of St. Christopher's Hospice, the first “modern” hospice (Clark, 1999b; Granda-Cameron and Houldin, 2012; Storey, 1996). The hospice movement acknowledges that while “it is important that we attend to the patient's physical symptoms and pain control, it is crucial that the healthcare system expand the care beyond treating these symptoms and more closely address psychological, social, and religiosity/spirituality themes in end-of-life care for both patients and families” (Meier *et al.*, 2016: 269).

2.2.2 An Education: Palliative Care Treatment, What It is and What It is Not

Providing care for those with terminal or life-limiting conditions within their local communities, “hospice care aims to affirm life and death” (Hospice UK, 2018: 2). Multidisciplinary teams of staff and volunteers provide expert support, emphasising individualised clinical, physical, emotional, social, and spiritual needs. This support extends to carers, families, and friends pre- and post-bereavement (Hospice UK, 2018). Hospice services play an essential role in providing highly specialised care. They also play an integral role in EoL care and should be a critical voice in future planning and development of government policies (Hospice UK, 2018). In 2016-2017 hospices in Scotland provided care and support to over 20,000 people (Hospice UK, 2020). In 2016, almost 56,700 people died in Scotland (National Registers of Scotland Vital Events: Deaths, 2017 as cited inHospice UK, 2018), an estimated 75% of these deaths requiring palliative care (Murtagh *et al.*, 2014), equating to 42,800

people each year (Hospice UK, 2018). However, it was estimated that 1 in 4 people who could benefit from palliative care do not receive it (Health and Sport Committee, 2015 as cited inHospice UK, 2018); meaning there are potentially 10,600 people in Scotland missing out on this care (Hospice UK, 2018). The Scottish Government (2015b) and Scottish Government (2015a) had set a goal that by 2021, access will be provided for everyone requiring palliative care. Hospice UK (2018) suggests that, for the Scottish government to achieve their visions, it must invest and work in collaboration with hospice services. Currently, around 60% of funding for hospice services was contributed directly by local communities.

Palliative care and end-of-life (EoL) care, both offered within hospice services, have a principal focus on maintaining quality of life (QoL) (Krau, 2016). However, these terms are often used interchangeably, leading to confusion and misconceptions about services (Marie Curie, 2018). Although similar concepts, they have different meanings (Krau, 2016). Palliative care involves ongoing treatment for people with terminal illnesses, including symptom management, addressing social, spiritual, and psychological needs, and supporting family and friends. A life-limiting illness can include cancer, Motor Neuron Disease (MND) and dementia, among others. The WHO (2018: 5) define palliative care as:

> "the prevention and relief of suffering of adult and paediatric patients and their families facing the problems associated with life-threatening illness. These problems include physical, psychological, social and spiritual suffering of patients and psychological, social and spiritual suffering of family members".

In comparison, EoL care is an aspect of palliative care provided to those nearing death and focuses on allowing people to "die with dignity" (Krau, 2016: ix). In EoL care, most people would prefer to die at home (Nilsson *et al.*, 2017). However, 2014-2018 figures show that 42.5% of people with cancer die in hospitals, with 19.6% in hospices and 7.5% in other institutions, leaving only 30% to achieve the majority's preference, dying at home (Public Health Scotland, 2020). However, this preference may change in response to a requirement for increasing care needs, provision, and support (Public Health Scotland, 2020); in either case, it seems pertinent that people

feel as comfortable and “at home” as possible within a healthcare setting.

Although synonymously related to EoL care, the hospice should not be seen solely as a place where one might come to die. There is so much more to the hospice than the general preconceptions held. For example, palliative care ensures that those with terminal conditions and their families retain the best quality of life (Scottish Government, 2019). A PPWH day patient succinctly encapsulates the ethos of the hospice, “Everybody says the hospice is the last stop before the terminus, but it taught me how to live, not how to die” (Building Better Healthcare, 2016).

2.2.3 Resilience within Palliative Care

Staff working within palliative care are faced daily with life-threatening conditions. Palliative care often requires more time and attention than traditional curative treatment, leading to more stress, higher levels of helplessness, and feelings of personal failure. However, palliative care staff do not report higher levels of psychological distress than other specialities (Whippen and Canellos, 1991). Surprisingly, however, they often report lower levels of burnout. From the beginning of the modern hospice movement, the potential stress of working with those with a terminal illness was recognised. As such, team development and staff support are considered integral to the effective delivery of palliative care and importance is placed on establishing organisational and personal coping strategies. Studies have shown that higher stress levels for palliative care staff can be caused by work environments lacking social support, no involvement in decision-making or unmanageable workloads (Vachon, 1995).

2.3 The Architecture of Palliative Care

Moorhouse (2006) is an architectural designer who undertook intensive research into hospices, research which informed comprehensive best practice design guides for a modern hospice. One of his main interests was the wellbeing of patients, families, and staff, establishing a practical, holistic environment that ensures that the best care was offered. To design a building that provides true hospice care, he stated that it needs to offer “hospitality to those who enter, a building which can allow the staff to

take care of seriously ill people in an efficient manner, yet appear non-institutional and comforting to those entering as patients or as their caregivers" (Moorhouse, 2006: pix). His views draw parallels with the aims of this thesis, determining environmental elements that positively contribute to people's wellbeing. Verderber and Refuerzo (2006) "Innovations in Hospice Architecture" exemplifies good architecture and hospice design features, with references to real-life case studies. Mirroring the ethos of palliative care, Verderber and Refuerzo (2006: 4) state, "palliative architecture is compassionate. Its aim is to relieve unnecessary pain, stress, and discomfort".

2.3.1 Maggie's Cancer Centres: Architectural Innovation

Arguably, the most well-known cancer care centres worldwide are the UK Maggie's Centres. These are small-scale buildings which place equal importance on healthcare and architecture; not just aesthetically pleasing but contributing towards the wellbeing of cancer patients. The architectural brief is somewhat unique, not heavy on technical details but on the process of collaborative vision building: attributed to not having a defined typology beyond supporting people through life limiting diagnoses. In order to analyse the brief, it is important to provide an understanding of the origins and philosophy that inspired its organic growth from the original 1998 two-page brief (Frisone, 2021). The origins began from the lived experience of Maggie Jencks (1995) throughout her cancer journey, written while in remission from treatment as part of a clinical trial in Edinburgh's Western General Hospital. She reflects on the constant sense of overwhelm and the absence of support to deal with the mental load of the illness, in contrast with the exceptional medical treatment. She found great benefit in learning about her illness and developing a series of holistic treatments that worked for her (Jencks, 1995). In the forward, Blakenham (2007: 2) writes, "She came to believe that this quite deliberate move from passive victim to active participant was the single most important step she took in dealing with her illness. She was living, even if she was dying". The beneficial effects are rooted in the psychological impact of "Acting immediately, taking control in a situation beyond her control, and obtaining something rewarding for herself" (Frisone, 2021: 123)

Maggie's vision for future cancer caring centres was born from her experiences, aiming to establish a welcoming environment near a hospital that supports those to take an active role in their treatment and provides a space of respite from the often-intensive medical treatments. In her writing, Maggie stipulated that there should be three main components: support to provide useable and clear information, support with finding suitable relaxation therapies and providing individual and psychological group support (Blakenham, 2007). To ensure the ability to stimulate and evoke people's senses, beauty and art are to be prioritised "to surprise and open a 'window' to the world" (Frisone, 2021: 132).

In 1995, Architect Richard Murphy and Maggie formed the initial blueprint for the concept and further developed it into a building. Although dying shortly before the first centre was built, her husband followed through with her intentions. This culminated in the first Maggie's Centre opening in the grounds of the Western General Hospital. A person-centred approach to the provision of information, psychosocial support, nutrition advice, and relaxation and exercise techniques. Murphy's open plan spatial layout with kitchen at the heart of the building, visible from the entrance, an open staircase and mezzanine, elimination of corridors and an immersive nature experience became a cornerstone of Maggie's (Blakenham, 2007). This nature experience is such a staple of Maggie's that in 2015, the architectural brief was renamed "Maggie's Architectural and Landscape Brief" (Frisone, 2021). Of the building Blakenham (2007: 27)writes, "[It] is full of zest and life and colour. Light floods in from a ridge roof-light. The interior space is flexible, with dividing sliding doors. From the large entrance space it is possible to understand what is going on in all the other areas of the building. There are no intimidating closed doors with specific labels on them". Effectively capturing the ethos of Maggie's brief and setting a precedent for future centres.

The Maggie's Centre brief is relatively short, adopting a narrative approach comprising seven sections, only one detailing any spatial requirements. A summary and analysis of each section of the current brief can be found in Table 2-1. It is sparse in technical detail and focuses heavily on atmosphere and people's

experiences of the space (Maggie's, 2015; Van der Linden, Annemans and Heylighen, 2016), particularly addressing and catering for the broad spectrum of emotional states for those who access the building from families, friends, carers and those living with cancer. Although lacking in detailed technical constraints, the brief is demanding, with Blakenham (2007) stating they want more than functional spaces; they want the building to embody a 'spirit': one where quality makes you feel valued, a place where you feel at home, a place that inspires curiosity and imagination, which makes you feel alive and makes you want to explore, a place that encourages a sense of confidence and resourcefulness, facilitating finding new perspectives in which to view your current situation, and importantly, reduce anxiety.

Ultimately, the intention was to make a positive difference in the experiences of those living with cancer, their family, carers and friends. Where a typical architecture brief might focus on space size and function, Maggie's focus on space, atmosphere, and experience. Where a brief might focus on practical considerations of layout, adjacencies, and restricted areas, Maggie's focus on creative integration of spaces and encouraging curiosity to explore. A unique aspect of Maggie is not requiring a specific function beyond that of supporting those living with cancer, which allows this freedom, and to achieve these goals, they specifically seek architects with "the imagination, the confidence, the ability and the understanding to respond to such a brief." (Blakenham, 2007: 38). The brief allows for creative interpretation of how this will manifest into functional spaces, with architects being able to develop their subjective responses.

Table 2-1 Summary and Analysis of Maggie's Centre Brief

Maggie's Brief Section	**Summary of requirements**
The work of the building, the landscape and the environment	This section of the brief considers the atmosphere of the building, the landscape, the interior, and the art. It highlights the importance of these elements facilitating and providing a different dimension to the support at Maggie's. The brief's aims about "the feelings we need the design of these places to convey" (Maggie's, 2015: 3) are evident throughout. The elements should establish a welcoming, friendly, inviting and stress-reducing environment. It should "shine out like a beacon of

	hope" and be bold, beautiful, self-confident and joyous. It should encourage curiosity, imagination and empowerment. While also feeling like a place of safety and shelter for rest, with a clear layout and purpose. Importantly, it should have connections and create bonds with the local community. All of this should be achieved without being intimidating or patronising, and the challenges that will be faced should be openly acknowledged. There is a strong focus on creating a seamless connection and integrating nature and building. The landscape being seen as a gentle threshold between the hospital and Maggie's that can "help you shed a little of the stress of the hospital atmosphere"p3. They should be designed to appeal to all senses, weather conditions, and seasons and be a place for socialisation and solitude. What should be achieved is "imagination and thoughtfulness which looks beyond the normal boundaries of function." (Maggie's, 2015: 5)
Relationship between Maggie's and the hospital it is supporting	Maggie's are built within the grounds of a larger hospital that provide cancer treatment. The brief highlights the difference in function and scale of the two buildings: one is a medical specialist, and one is a person-centred specialist. "Maggie's scale is deliberately a domestic one, the antithesis of the hospital's" (Maggie's, 2015: 5)
Maggie's and its local community	Ties with the local community are encouraged; the local area should feel like it is their space. This is vitally important in terms of service delivery as they are self-funded.
How the building and garden will be used	The building can be used by anyone involved in someone's cancer journey and various scenarios. The centre should acknowledge and design to account for this.
Spatial Requirements	This area is the only section of the brief that goes into any technical details regarding the type, number, and accommodation of spaces. Although still limited in this regard, with the importance placed on relationships between the spaces, transitions, nature connections, atmospheres and feelings, they should invoke a non-institutional and informal feel but have sufficient equipment and storage for functional aspects without overshadowing the importance of the person, their well-being needs and emotional requirements from the space. These physical areas are: • Entrance • Entrance/welcome area • Office • Computer desk • Notice board • Library • Sitting rooms: three to suit various activities • Consultation rooms

	• Toilets • Retreat • Views out • Views in • Parking As with the other sections, we can see a focus on creating emotionally supportive spaces using terminology such as: • A space to pause • Be encouraging • Feel private and not overlooked • Friendly and cosy • Connection with nature • Visible but not overbearing • Be comfortable • Observable
Budget	The building should be economical in both its construction and ongoing maintenance. The brief is purposefully generic to allow a creative approach to achieve this. They reiterate the key considerations of the building to "to build a beautiful, small, humane building, which raises your spirits when you walk into it" (Maggie's, 2015: 10)
Client Team	A small client team is involved in commissioning, handover, and beyond. A good working relationship and open communication channels should be maintained.

Maggie's has been the focus of various research articles, most of which have been conducted by economists, sociologists, or environmental psychologists, with only a few by architects (Frisone, 2021). Searching for "Maggie's Centre" (March 2024) in Scopus uncovered 30 articles, the earliest dating to 2004. This coincides with the first purpose-built facility in Scotland, Maggie's Dundee, designed by Gehry Partners and opened in 2003, which generated significant media attention around "the psychological impact that high quality architecture had on people with cancer" (Frisone, 2021: 120). The first external manifestation on the building face of Maggie's architectural brief was its exterior replicating abstract home-like aesthetics, an aim that had always been prominent for the interiors. A literal interpretation of the aim for Maggie's to be domestic in scale, the antithesis of the hospital as "The concern is for you as a person; the focus is on you, not the disease" (Maggie's, 2015: 5).

A thesis by Frisone (2021) provides a comprehensive investigation of the Maggie's Centres, understanding the relationship between the brief and positive user experiences, detailing its therapeutic environmental elements, and evaluating it as a model for other healthcare and community facilities. Research by Van der Linden, Annemans and Heylighen (2016) contributes specifically to the architectural interpretation of Maggie's Centre brief and interpretation of a healing environment by interviewing five Maggie's designers. The research identified several key themes for creating Maggie's healing environment, including nature, spatial experience, domesticity, and privacy. The entrance design was significant in ensuring it responded to visitors' varying emotional needs. A more uniquely Maggie's execution of a healing environment was the creation of domesticity to support relaxation, bolstered by the philosophy of "Kitchenism" proposed by Jencks and Heathcote (2010): in short, the absence of a reception desk, in favour of a centrally located kitchen. Although designing such spaces can be challenging due to the subjective nature of how people respond to environments, close collaboration with the client team mitigates this. The research additionally highlights the importance of this collaboration with Maggie's Trust. Their involvement in the design process and creation of the building's specific design themes was crucial to ensuring the views and voices of the people using the building were evidenced, which mitigates the risk of overlooking those who will use the building. Ultimately, it is a critical factor in the success of a healing environment (Van der Linden, Annemans and Heylighen, 2016).

Diverging momentarily from Maggie's, it is noteworthy that Van der Linden, Annemans and Heylighen (2016) seemingly disregard the role of scientific research in the creation of healing environments. They stated that the designers they interviewed did not rely on scientific research, which they describe as "difficult to access and integrate into the design process," but instead drew upon their "intuitive knowledge and personal experience" (Van der Linden, Annemans and Heylighen, 2016: 512, 530): They further comment that these designers operate "in the absence of scientific knowledge" (Van der Linden, Annemans and Heylighen, 2016: 513). This criticism appears to target positivist research specifically rather than empirical evidence as a whole, as the authors do acknowledge the contributions of

phenomenologists. Nevertheless, it underscores a persistent disconnect between architecture and academia, something explored in Chapters 4 and 5. Their statement that "Architects hold a rather intuitive knowledge about architecture's healing potential, which is not specifically stated in an elaborated theory or grounded in scientific research" (Van der Linden, Annemans and Heylighen, 2016: 513), and that Maggie's is "a case where a healing environment is realised without a scientific basis but inspired by user experience" (Van der Linden, Annemans and Heylighen, 2016: 531), oversimplifies the expertise required to develop such knowledge. The creation of innovative environments that meet client expectations require both an awareness of precedents and the ability to critically appraise them. This article, if anything, highlights the need for greater integration of academic research within architectural practice, making it more accessible and applicable. Ulrich (1991) advocates for the use of scientific research not as a replacement for designers' intuition and creativity, but as a complement to it. Similarity, Pert *et al.* (2013a; 2013b) emphasises the importance of precedents and research in the development of strong concepts and innovative designs, as evidenced within the PPWH design. Their design process for the PPWH, informed by a detailed analysis of the Sengetun, the creation of a seasonal garden ensuring year-round foliage, and the exploration of opportunities to connect the building with nature, demonstrates that grounding design in research does not constrain creativity but rather enhances it. Their approach was further supported by visits to hospices across the UK, including several Maggie's Centres in Dundee, Glasgow Western, Edinburgh, Kirkcaldy, and Gartnavel.

2.3.2 Prince & Princess of Wales Hospice: Architectural Innovative

One of the unique aspects of the PPWH was the incorporation of the Scandinavian Sengetun care model within the inpatient unit, which will be explored in Chapter 8. The Sengetun is a person-centred decentralised care model that accommodates partially autonomous units within separate buildings, these units being smaller than traditional centralised designs. The Sengetun model was pioneered within St Olav's hospital, a 210,000m^2 project in Trondheim, Norway. The hospital had a unique concept of being physically located throughout several small buildings with different treatment focuses connected through bridged streets, with gardens and landscaping in

between. All the clinical centres are based on the same physical principles, that of the "the generic centre", establishing standardised criteria (Hansen and Jensø, 2009). The architectural competition launched for St. Olav's aligned with the solid Norwegian belief that a well-designed clinical environment reduces recovery times (Jamieson, 2008), supported by EBD (Ulrich *et al.*, 2008). The design team's decision to maintain patient involvement throughout the project positively influenced the design and development process (Emmitt, Prins and Otter, 2009; Hansen and Jensø, 2009). One primary outcome of these consultations was the complete incorporation of single bedrooms in small group clusters within the wider department (Jamieson, 2008; Rechel *et al.*, 2009); these developed patient-focused designs named the "Sengetun", a Norwegian term that translates to "the bed cluster" (Jensø and Haugen, 2005). The aim is to bring staff together around the patient instead of the traditional model of having patients transported between various departments during their treatment. The incorporation of this model into the PPWH will be explored in Chapter 8. Jensø and Haugen (2005) suggests that the quality of hospital facilities can be determined by the buildings' ability to change and adapt to suit future organisational, operational, and technical changes, in addition to keeping up with rapid advancements in treatment and technology. The design is grounded in the Planetree philosophy, which emphasises the personalisation and humanisation of treatment (Jensø and Haugen, 2005), as explored in the following section.

2.3.3 Planetree Philosophy

The design of St. Olav's was based on the Planetree philosophy (Hansen and Jensø, 2009; Jensø and Haugen, 2005), aiming to reclaim "the holistic, patient-centred focus that medicine had lost" (Hansen and Jensø, 2009: 189). The Planetree model was developed in the late 1970s (Andrade and Devlin, 2015) and was born from the experiences its founder, Angelica Theriot, had in hospital while seriously ill. She recounts, "alienation, fear, hopelessness, loneliness, and dehumanisation were the emotions that overwhelmed me during my hospital stay and led me to feel that I would never get out alive" (Thieriot, 2009: xxiii). She mentioned that the only joy she found while in hospital was an orchid she had been sent, "Which became the centre of my attention… I stared at it as if to save my life" (Thieriot, 2009: xxiv).

Planetree envisioned healthcare facilities as “a place where individuals were truly healed, not just a clinical setting for medical intervention”, placing importance on all those involved in the healing process and encouraging caring “for the body, mind, and spirit” (Montague and Sharrow, 2009: 172). This was achieved by developing “a treatment model that personalises, humanises, and demystifies the entire healthcare experience, encouraging design that would support these goals” (Hansen and Jensø, 2009: 189). It focuses on opportunities for patients to become equals in their treatment through education and engaging sensory experiences (Andrade and Devlin, 2015). Consideration of the five senses is an integral aspect of the Planetree philosophy; a journey of the senses, experienced from arrival to departure, “what one sees, hears, smells, touches, and tastes there is vital to the experience of being in a holistic, patient-centred environment” (Montague and Sharrow, 2009: 163). Other integral considerations are “privacy, control, access to nature, the nurturing and communal elements of social interactions, and a sacred and honest approach to an environment that must be both high-tech and high-touch” (Montague and Sharrow, 2009: 172-173). It is expected that any organisation adopting the Planetree patient-centred model of care facilitates ten components, which are;

- human interaction;
- informing and empowering diverse populations (access to information);
- involving patients, families and volunteers (healing partnerships);
- nurturing and healing aspects of food (nutrition);
- spirituality (culturally diverse);
- incorporation of complementary and alternative practices;
- incorporation of art;
- establishing a healing environment; and
- establishing healthy communities (outreach).

(Frampton and Charmel, 2009; Malkin, 2008; Stone, 2008)

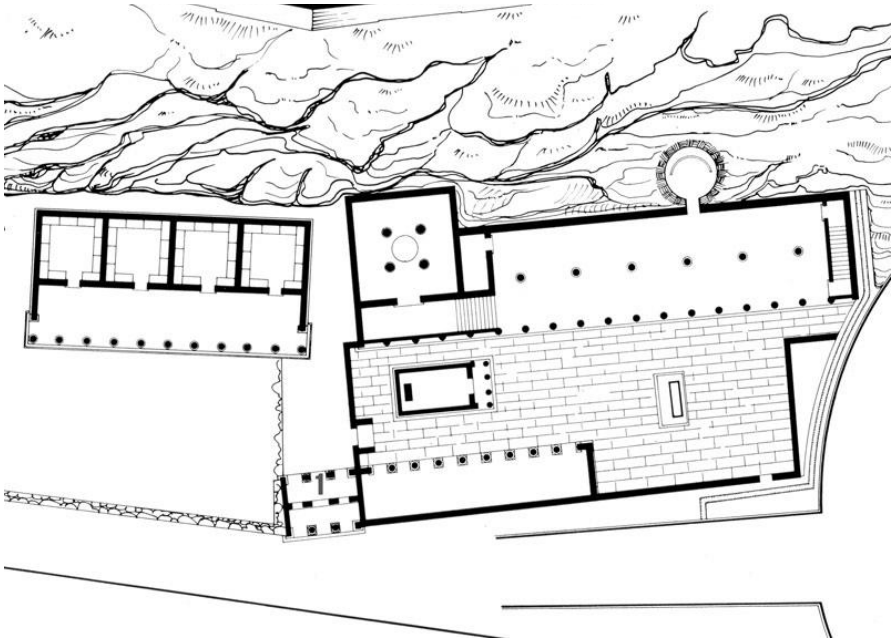
2.4 The Healing Environment

The roots of the Planetree philosophy are not novel. After being discharged from

hospital, Thieriot researched historical hospital development. Her goal was to understand how we ended up with the efficient but dehumanising environment of modern healthcare and to find ways to reverse this trend. The philosophy of the healing environment can be traced back over 2000 years to the Aesculapian hospitals of Ancient Greece. Historically, they were located on sacred sites and utilised aesthetics, movement, music, theatre, poetry, and patient empowerment within the healing process. Thieriot (2009: pxxiv) contemplated, "the crucial elements, I imagine, was hope and the positive support of the Aesculapian priest, whose vocation it was to heal". The patient was an essential consideration of ward precedents in the Asklepieion of Athens. It provided "places for inpatient nursing, which included bed rest, treatments, medication, baths, diet, and exercise" (Thompson and Goldin, 1975: 3). Figure 2-1 shows floor plans of a space where patients came together to rest and dream. Dreams featured guidance from the god Asklepios, dreams which were translated into the treatment performed. The rooms were 24 feet deep and 108 and 96 feet long, fully enclosed on three sides and open to the south as a Greek stoa (portico), orientated towards the sun. Although the medical theory behind this model was questionable, some of the "patients" even being stand-ins for those too ill to undertake the pilgrimage, it was evident that it influenced the future of healthcare ward design (Thompson and Goldin, 1975).

The definition of a healing environment goes beyond a safe building to one that embraces and supports patients, visitors, and staff. Healing environments encapsulate a place to heal the mind, body, and soul; a place interwoven with respect and dignity; a place defined through life, death, illness, and healing, supported by architecture (Dellinger, 2010). It reveals the importance of physical and psychological environmental factors impacting people. The physical setting and organisational culture can contribute to producing a thriving healing environment (Ampt, Harris and Maxwell, 2008), the creation of which can allow patients autonomy to "mobilise inner resources from the body, mind, and spirit that help them to respond and adapt to their own illness" (Stichler, 2001: 3). Healthcare environments should encapsulate the healing environment and facilitate a "therapeutic, curative, and restorative physical setting to meet the patients' and families' emotional and physical care needs

Figure 2-1 Floor plan of the Asklepieion of Athens (Thompson & Goldin, 1975, p3).



while still supporting professional practice" (Stichler, 2001: 2).

Many components which contribute towards establishing a healing environment include;

- Air quality
- Thermal comfort
- Noise control
- Privacy
- Light
- Views of nature
- Access to nature
- Positive distraction
- Visual stimulation
- Access to social support
- Choice (sense of control) and options
- Elimination of environmental stressors, including noise, glare, and poor air quality

- Sense of serenity

(Dellinger, 2010; Malkin, 2008)

2.5 A Person-Centred Philosophy

Western societies have become increasingly more individualised over recent centuries, as evident in society, lifestyles, politics, opinions and our healthcare systems. A person-centred approach "offers a remedy to the continuing crisis in healthcare – a crisis in which clinicians and patients struggle to co-produce personalised and compassionate healthcare for patients rather than based on restricted scientific knowledge" (McCormack *et al.*, 2017: pxiii). As such, healthcare shifted from a doctor- or disease-centredness towards a more patient-centred approach with individualised treatment plans and empowering patients with self-management and responsibility for their health (McCormack *et al.*, 2017). Patient-centred care involves evaluations that relate to what the patient finds most convenient and comfortable (Malkin, 2008) involving collaboration between patient and care teams "where [patients] are communicated with, educated and empowered to make their own decisions regarding their personal health care" (Kanter and Horowitz, 2009: 216). The aim is to "deliver care responsive to people's individual abilities, preferences, lifestyles and goals" (Collins, 2014: 1). Organisational culture plays a crucial role in establishing a person-centred environment, requiring a sustained commitment to "practice development, service improvement and ways of working that embrace continuous feedback, reflection and engagement methods that enable all voices to be heard" (McCormack *et al.*, 2017: 6). This culture can be evidenced within a palliative care setting, one long-established within the PPWH, and explored in Chapter 8.

The architect Alvar Aalto (1998) argues that humanising architecture requires consideration of function from a human perspective, advocating that hospital architecture must respond to human requirements: "the duty of architecture is to eliminate all disturbing elements" (Aalto, 1998: 78). In the early 21st century, when standard hospital design focused on accommodating medical protocols and equipment, his design for the sanatorium in Paimio, Finland (designed in 1929)

focused on “the patients, their needs and wellbeing” (Ehrström *et al.*, 2005: 31); consideration given to the physical and psychological factors involved in the healing process (Grabow and Spreckelmeyer, 2015). Firstly, the primary user had been considered, with Aalto's explanation that “the ordinary room is a room for a vertical person; a patient room is a room for a horizontal human being, and colors, lighting, heating, and so on must be designed with that in mind” (Aalto, 1998: 78). For example, as the ceiling might be “the only view of the reclining patient for weeks and weeks”, consideration was given to a darker colour and ceiling lights placed out with a patient's angle of vision (Aalto, 1998: 78). The bed area remains essential today, acknowledged by Thompson and Goldin (1975: 3) stating, “the chief occupants of a nursing area- those for whom it was designed— are horizontal most of the time. Because the patients are bedridden, the central and most important part of a nursing ward is the bed area”.

The sanatorium was designed to treat tuberculosis, which was considered an incurable disease at the time. The primary treatment for symptom reduction was isolation and exposure to fresh air and sunlight. The treatment was based on medical guidance of the late 1920s, “isolating the patient from the urban environment of smoke and pollution and effecting a cure by allowing him to sit in the sun absorbing solar rays and breathing in fresh air” (Pearson, 1978: 84-85). These treatments were accessible directly from the balcony in each patient's bedroom and additionally from the top terraces, thus providing fresh air and sunlight, with the natural pine forest setting contributing to the healing aspects of nature (Grabow and Spreckelmeyer, 2015; Quantrill, 1989)**.** These balconies remain in use today, over 90 years later. One of the biggest testaments to the patient-centred design was that it has endured against functional and technological changes, maintaining its original typology of functional, clinical, and architectural separation through its functional evolution from a sanatorium to a general regional hospital, then to its current use as a university hospital. Jensø and Haugen (2005) suggest that an important aspect contributing to the quality of hospital facilities can be determined by the buildings’ ability to change and adapt to suit future organisational, operational and technical changes and keep up with rapid advancements in treatment and technology, Aalto’s’ design highlights the

importance of moving away from hospitals built around technologies and medical advancements, towards sustainable patient-orientated hospitals, since what is intrinsic to human need and wellbeing will always be the one constant in the rapidly evolving medical model.

2.6 Evidence-Based Design

The term EBD was first defined by Hamilton (2003) as "the deliberate attempt to base design decisions on the best available research evidence" (Hamilton, 2003: 19) utilising "credible research to achieve the best possible outcomes" (The Center for Health Design, 2019). EBD is a natural parallel to evidence-based medicine, encompassing evidence-based practice (Hamilton, 2003). It is becoming more important within the field of architecture (Kato *et al.*, 2008) and can ensure that "design [is not] only visually striking, but [is] design that works for people" (Brandt, Chong and Martin, 2010: 221). Similar to how evidence-based medicine does not provide an exact replication for future unique studies, EBD alone cannot lead to project-specific design solutions. However, it can identify tried and tested innovations and strategies that can lead to a successful project (Zimring and Bosch, 2008).

Florence Nightingale's (1860; 1863) empirical observations, dating back to the late 19th century, documented within "Notes On Nursing" and later "Notes On Hospitals", illustrate the importance of human considerations within a healthcare environment to aid healing processes. One insight offers grounds on which, over a century later, the EBD movement would employ: "in promoting recovery, the being able to see out of a window, instead of looking against a dead wall; the bright colours of flowers; the being able to read in bed by the light of a window close to the bedhead. It is generally said that the effect is upon the mind. Perhaps so, but it is no less so upon the body on that account" (Nightingale, 1863: 19). There is now a substantial body of evidence to support that "Our health and wellbeing is influenced by the environment we occupy, by physical factors such as air quality, noise, daylight and climate but also by psychological factors such as a perception of safety or of being valued … key to this is the way in which we experience a healthcare

building – its initial impression, ease of access and the way it interacts with external spaces and nature" (Hoskins, 2008: 8). Highlighting the importance of perception and personal experience in the environment. Only recently, however, have attempts been made to record this by scientific means, with Ulrich *et al.* (2004); Ulrich *et al.* (2008) reviewing over 600 studies to establish a literature base for healthcare EBD. Many of their findings relate to patient safety and healing, families' stress levels, staff stress and efficiency, and overall healthcare quality and cost improvement. The most significant findings show that access to daylight, views of nature, increased privacy, and noise reduction add to a healthier and more effective hospital environment (Ulrich *et al.*, 2008).

Ulrich (1991) states that architecture can facilitate healing and, to this end, should establish a supportive and stress-reducing environment. Understanding stress is a fundamental factor in determining how healthcare environments affect users. Designing a stress-reducing environment can provide better social support, give occupants a sense of control, and enhance mood and wellbeing (Ulrich, 1991). The main goals of evidence-based healthcare design is to establish an environment that is "therapeutic, supportive of family involvement, efficient for staff performance, and restorative for workers under stress" (Hamilton, 2003: 19).

2.7 A Wellbeing Philosophy

Wellbeing is an umbrella term that combines many factors influencing our lives, such as happiness, positive emotion, engagement, meaning and purpose, life satisfaction, relationships, social support, and accomplishment (Seligman *et al.*, 2011). Various disciplines frequently use the terms "quality of life" (QoL) and "wellbeing" synonymously, leading to confusion about the exact definitions (Dodge *et al.*, 2012). QoL is related to various aspects of personal satisfaction with life, from the physical to the social and psychological (Upton and Upton, 2015); defined by the WHO as "an individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns (WHO, 1997: 1). On the other hand, "the concept of wellbeing is undeniably complex" (Dodge *et al.*, 2012: 229). The Oxford

English dictionary defines wellbeing as: “the state of being comfortable, healthy, or happy”. The vagueness of the definition indicates the difficulty in establishing a firm consensus on its definition; and even how it is spelt[2] (Dodge *et al.*, 2012). Upton and Upton (2015: 106) defined the terms within healthcare settings as QoL relating to “deficits of daily living”; and wellbeing relating to “the presence of positive emotions and hope for the future”.

There has been an increasing interest in QoL research within the last few decades, often referred to as health-related quality of life (HRQoL) within healthcare settings and becoming an essential component of Patient-Reported Outcome Measures (PROMS). However, Upton and Upton (2015) suggest clinicians and researchers should move beyond a sole focus on QoL and instead attempt to explore wellbeing assessments. The term wellbeing features in the WHO definition of health as “a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity” (WHO, 1948: 1). Over 30 years later, Aaron Antonovsky, a professor of sociology, critiqued this definition of health, stating it “is impossibly abstract, philosophically utopian and misleading, and static” (Antonovsky, 1979: 55). Its broadness makes it challenging to measure, lacks acknowledgement of contributions to life’s struggles, and biases towards health being within the domain and control of “medical imperialism” (Antonovsky, 1979: 53), i.e., it being out with the control of the individual. He references Duno’s definition of health as his

[2] Throughout this thesis, the un-hyphenated version of wellbeing will be utilised (unless directly quoting other works). This, in part, was influenced by hospice staff mentioning (and to the project architect at the inception) that those using the building should be referred to as “people' and not the standard architectural term “users'. However, it did allow a new perspective to be considered within this study, checking if the terminology itself aligned with the concept of wellbeing rather than being purely academic. This is why there are documented deviations away from the traditional architectural or even medical language when recounting people's views or describing the building use. In short, wellbeing seemed to fit more conceptually with its meaning, rather than the seemingly more distant or cold feeling (to the researcher and hospice staff) hyphenated version of wellbeing.

preference, being “a modus vivendi enabling imperfect men to achieve a rewarding and not too painful existence while they cope with an imperfect world” (Duno, 1968, p67 as cited in Antonovsky, 1979: 53), suggesting we should depart from the traditional medical model of treating illness or disease towards a holistic approach that addresses the broader factors contributing to wellbeing. “one of Antonovsky's deviations from pathogenesis was to reject the dichotomisation into categories of sick or well” (Vinje, Langeland and Bull, 2017: 36). To align with his vision, he coined the term “salutogenesis—of the origins (genesis) of health (saluto)” (Antonovsky, 1979: preface vii) with “the state of heterostatic disequilibrium as the heart of the salutogenic orientation”, rather than that of homeostasis (Antonovsky, 1987: 130). This knowledge that a medical approach is not always the curative approach was empirically documented over a century before by Nightingale (1860): “It is often thought that medicine is the curative process. It is no such thing; medicine is the surgery of functions, as surgery proper is that of limbs and organs. Neither can do anything but remove obstructions; neither can cure; nature alone cures. Surgery removes the bullet out of the limb, which is an obstruction to cure, but nature heals the wound. So, it is with medicine; the function of an organ becomes obstructed; medicine, so far as we know, assists nature to remove the obstruction but does nothing more. And what nursing has to do in either case is to put the patient in the best condition for nature to act upon him”.

Taking on the challenge by Upton and Upton (2015), this thesis focuses not on QoL but on wellbeing. Therefore, defining and choosing the relevant aspects of wellbeing involving terminal illness was essential. Historically, there are two approaches to defining wellbeing; hedonic and eudaimonic[3]. Hedonic was first defined in the 18th and 19th centuries, encapsulating happiness, the absence of negative effects and the presence of a positive effect. Eudaimonic wellbeing has its roots in Ancient Greece, encapsulating positive psychological functioning, self-realisation, development, and individual growth. The former is associated with the Benthamite tradition of

3 often anglicised to eudemonic

contentment by English philosopher Jeremy Bentham. The latter is associated with the Aristotelian tradition of having purpose and meaning in life by philosopher Aristotle (Kesebir and Diener, 2009; Oishi, Diener and Lucas, 2009; Sirgy, 2012). This research focuses on aspects of eudaimonic wellbeing, focusing on people's judgements about their meaning and a sense of purpose in life, with chronic illness shown to impact this negatively (Steptoe, Deaton and Stone, 2015). Having meaning, purpose, and appreciating everyday life are significant to enhancing wellbeing and QoL (Cohen and Leis, 2019; Drageset, Haugan and Tranvag, 2017). EoL patients show that having a sense of self and independence supports their dignity (Enes, 2003). Independence allows people to feel in control of their situations and lessens feeling a burden on others, which is detrimental to many people's wellbeing (Leichtentritt and Rettig, 2000). Having an accessible environment helps support independence, which can be measured objectively against building standards, but perception and subjective opinions on these elements within a healthcare environment are also important. These environments must usually achieve higher standards of accessibility to be adaptable to more complex needs. Therefore, having an environment that supports independence, a sense of belonging, and purpose could prove highly beneficial for positively affecting eudemonic wellbeing.

2.8 Conclusion

Dr Anne Gilmore, the founder of the PPWH, once said of a hospice that “the aim at all times is to enhance the quality of life… the building itself is part of the therapy” (The Evening Times (1987) as cited in Glasgow Evening Times, 2012). A sentiment ingrained in the establishment of the modern hospice movement in the mid-20th century. This chapter established the context for this study by providing a brief history of the hospice movement, the origins of the Sengetun care model, literature on healing environments and the definitions of wellbeing. The following chapter will examine existing theories on establishing supportive environments that enhance wellbeing.

Chapter 3
Literature Review: Supportive Design

This chapter expands on the evidence-based design (EBD) literature introduced in the previous chapter, focusing on empirical findings and theory. First, it introduces Ulrich (1991) Theory of Supportive Design. Then, it explores empirical evidence related to this theory, including an in-depth discussion on the three main components of "supportive" design: perceived control, social support and positive distraction. This literature is supported by expert opinions - particularly those related to aspects of the Planetree philosophy. Finally, it focuses on areas pertinent to the case under study and the field of palliative care, as uncovered through a desktop review of project documents and the literature review of the previous chapter.

3.1 Theory of Supportive Design

Ulrich (1991) argues that architecture can facilitate healing and, to this end, should establish a supportive, stress-reducing environment. Understanding stress is a fundamental factor in determining how healthcare environments affect users: a stress-reducing environment provides increased social support, gives occupants a sense of control, and enhances mood and wellbeing. He asserts that modern healthcare design creates "facilities that are functionally effective but psychologically "hard". These "hard facilities" and other aspects of poor design, work "against the well-being of patients" and fail to adequately address patients, visitors, or staff psychological needs, creating a stressful environment. He proposes

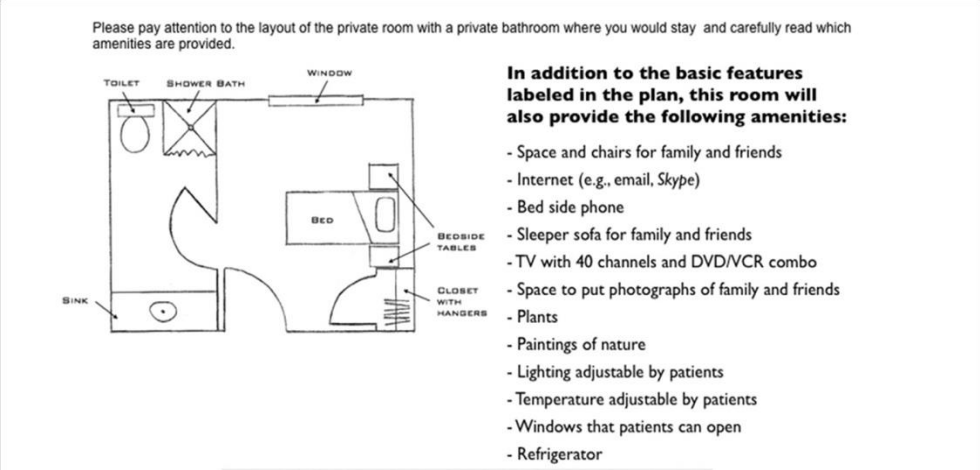
that supportive surroundings can address these issues and be “complementary to the healing effects of drugs and other medical technology” (Ulrich, 1991: 97). Thus, he proposed the Theory of Supportive Design to inform design that supports human functioning; centred around the concept that stress is “a major obstacle to healing” (p. 98) and that healthcare facilities should employ “environmental characteristics that support or facilitate coping and restoration with respect to the stress that accompanies illness and hospitalization” (Ulrich, 1991: 53). The mitigation of this “stress” is supported by three theoretical components, (1) sense of control, (2) social support, and (3) positive distraction. As with many studies involving wellbeing, Ulrich acknowledges that the theory does not encompass all factors influencing wellness. However, these three components have frequented empirical investigations.

3.1.1 The Empirical Evidence

The Theory of Supportive Design focuses on utilising scientific research to inform, rather than replace, “the intuition, sensitivity. and creativity of designers” (Ulrich, 1991: 107). It goes beyond simple data collection and feedback to obtain information about the design's psychological, behavioural, and health effects. The use of rigorous research methods can increase the credibility of innovative healthcare design within the medical community and provide concrete evidence for healthcare decision-makers to make informed choices. This collaborative effort between designers and the medical community can result in the creation of healthcare facilities that prioritise psychological support and wellness. Many researchers have used the Theory of Supportive Design as the basis for their studies. This section contains studies focusing on all three components of the theory.

The Theory of Supportive Design was the basis of an experimental study by Andrade and Devlin (2015), who additionally links this theory to the Planetree model. In the study, 217 students are shown the same standard single hospital bedroom with an ensuite floor plan, each containing eight different descriptions of room elements (see Figure 3-1): three containing lists relating to control, social support, or positive distraction, four containing various combinations of these elements and one control

Figure 3-1 Single inpatient bedroom containing list of perceived control conditions (Andrade, 2015, p4)



containing no elements. The study was designed to test the theory's applicability overall rather than identifying the influence of specific design features. The study employs a pre-existing scale for measuring perceived stress, positive distraction, and level of control over the physical environment, with a novel scale for measuring perceived social support (Andrade and Devlin, 2015). The findings show that positive distraction and social support reduced stress but did not increase feelings of control. As declared by the authors, it was essential to note that participants are students with an average age of 21. Therefore, this sample may not accurately represent the perceptions of hospital inpatients. However, to mitigate this, they were asked to “imagine that they had been hospitalized with symptoms of acute appendicitis” (Andrade and Devlin, 2015: 129). Individuals with little experience in hospital environments may have found it challenging to understand the potential benefits of certain elements, such as temperature control and openable windows, which were listed as stress-reducing factors in this study. As a result, the lack of correlation between stress reduction and control could be attributed to these elements not being considered unique or specialised amenities by those not familiar with hospital environments. Further explained by the authors, being unwell produces differing physiological and psychological conditions that can impact the perception of the environment and needs within it. This was a consideration conveyed by Zolkefli (2017) who suggests that, for patients with unknown illness trajectories, choice over other aspects can offer them a sense of control. Having choices,

expressing them, and seeing them be respected was integral to a person's sense of purpose and self-worth (Zolkefli, 2017). Cohen and Leis (2019) revealed that feelings of uncertainty and not being in control could negatively impact quality of life. Lack of perceived control could manifest in feelings of helplessness and anxiety and even lead to patients refusing care without entirely wanting to, just to maintain control (Enes, 2003). Therefore, having choice over any aspect of an environment can improve patients' perceptions of control, no matter how inconsequential they seem.

A study by Suess and Mody (2018), which addresses the sampling demographic concerns of the previous study, evaluates the impact of hospital design on patients' perceived well-being and behavioural intentions. Findings from 406 patients show that hotel-like features, which fostered a sense of control, provided positive distractions and access to social support, positively impact perceived wellbeing (see Figure 3-2). Social support in the form of hospitality and trained and certified healthcare staff that provided empathetic, respectful, and attentive healthcare delivery most positively impact perceived well-being, a perceived sense of control, and positive distractions. However, the authors acknowledged the limitations related to items focused on patient experience rather than the overall environment, such as

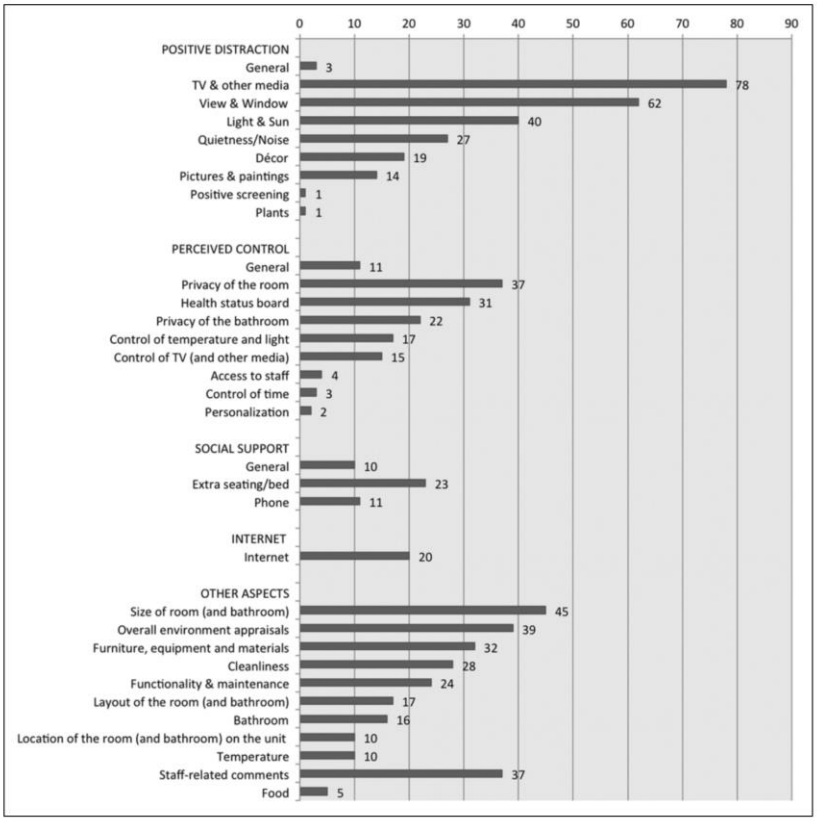
Figure 3-2 Patient ratings of important "Hospitality" supportive design features in inpatient bedrooms (Suess & Mody, 2017, p3016)

	Constructs and Measurement Items	(n = 406)	SD
Supportive design features: hospitality in healthcare	"Listed below are hotel-like features that you might find in a hospital's patient rooms. These features help a hospital provide a positive patient experience. Please rate how important it is to you to have these features in an in-patient room." (Measured on a 7-point Likert scale: 1 = Not at all important to 7 = Extremely important)		
	Factors that foster a sense of control		
	In-room spa/salon services	4.66	2.09
	Coffee/Tea-maker and refrigerator	5.14	1.84
	On-demand room service	5.35	1.70
	Smart-room technology	5.75	1.48
	Concierge services	4.52	2.03
	High-resolution flat-screen TV	5.66	1.42
	Positive distractions		
	Colorful walls	4.85	1.75
	Artwork	4.20	1.95
	Designer-inspired furniture	4.23	1.99
	Hi-end material finishes	4.38	1.96
	Aroma/fragrance	4.55	2.00
	Access to social support		
	Hospitality-certified healthcare staff	6.00	1.35

physical attributes of the space in views of nature or social and communal spaces.

Unlike the previous two quantitative focused studies, Devlin, Andrade and Carvalho (2016) focus on qualitative findings to determine patient satisfaction with design attributes of the real-world setting. The Theory of Supportive Design involves a non-exhaustive list of design attributes; therefore, their study attempts to explain these attributes as described by patients. It involved 263 Orthopaedic patients across five hospitals in the USA and Portugal to list and describe characteristics of their inpatient room that influenced their satisfaction with the hospital experience. 737 items were coded into five themes (see Figure 3-3) over half related to Ulrich's Theory of Supportive Design; 33.2% to positive distraction; 22.4% to perceived control; 6% to social support; and 2.7% to the Internet, (included within social support or positive distraction). The "other aspects" (35.7%) developed a fifth theme unrelated to the theory. Findings show distraction and entertainment are highly valued by patients in terms of TV, and other media, as are views of the outside, light

Figure 3-3 Frequencies of patients' comments by category related to design features which impact on satisfaction (Devlin et al., 2016, p202).



and sun. Features of considerable importance were privacy in the room and bathrooms, a health status board, and the ability to control and adjust environmental features. In addition, it was highlighted that patients desire space and accommodation for family and friends (e.g., extra seating and overnight bed), a good overall room standard (e.g., furniture, equipment, and materials, cleanliness), and good functionality and maintenance. However, findings highlighted aspects beyond the physical environment can impact patients' perceptions, such as quietness at night.

Interestingly, negative comments tended to be more specific than the positives, such as just mentioning TV for a positive. In contrast, negative comments about the TV went into detail about its absence, positioning, signal quality, and channel availability. Overall, the results evidence the importance of patients' needs for distraction, environmental control, and contact with family and friends during a hospital stay, as explored through the patient's personal experience.

3.2 Sense of Control

Ulrich (1991: 100) states that the influence of a sense of control on stress and wellness is well evidenced and suggests "humans have a strong need for control and the related need of self-efficacy with respect to environments and situations". Depression, passivity, elevated blood pressure and reduced immune system functioning can be the negative consequences of lack of control. This "lack of control can be mitigated by psychologically supportive design" (Ulrich, 1991: 100), i.e., a design which fosters a sense of control. However, Ulrich (1991) states there is a lack of empirical evidence identifying specific design strategies contributing to an increased sense of control and resultant stress reduction. The role of control in healthcare and the environmental factors that impact this are discussed in this section.

3.2.1 The Evolution of Death

The history of sickness and death can be traced over 50,000 years to Neolithic settlements, where cave dwellers formed "nests" to care for the sick and dying. Over the centuries, scholars have often considered death and dying taboo subjects, death

being associated with the devil and witchcraft. Contrastingly, in ancient Egypt, the dead were provided ample supplies for the afterlife, and their culture considered it far better than life on Earth. By the 18th century, there was a shift in Western traditions regarding death and dying due to the gradual development of religious practice and advancement in medicine, with Christian tradition dictating that families were responsible for nursing their dying relatives. The 19th and 20th centuries brought about the development of hospitals (Verderber and Refuerzo, 2006: 9-10). One of the most significant paradigm shift in how society viewed death occurred in tandem with the advancement of medicine in the late eighteenth century. Prompted by the discovery that many common causes of death could be prevented (Walters, 2004). "death was no longer viewed as part of the journey of life but rather as a medical failure" (Granda-Cameron and Houldin, 2012: 633). This caused a fundamental shift in how death and dying were treated, exemplified in work by Glaser and Strauss (1965), who introduced the concept of "awareness contexts" around death and dying. Their findings show dying of cancer in 1950s America occurred in a "closed awareness context". Physicians are aware of the patient's terminal status, which was often unknown to the patients. Cues indicating they might be dying are often vague and hard to read until the final stages. At the opposite end of the spectrum, they observed an "open awareness context" when visiting a Japanese hospital; the patient was fully aware of their dying status, with open communication and honesty between care providers and patients, epitomised by the ward sign labelled "cancer". Their findings highlighted that awareness context impacts multiple care factors and the relationships between the patients, families, and staff. Ultimately, they wanted their social research "to contribute toward making the management of dying—by patients, families and health professionals—more rational and compassionate" (Glaser and Strauss, 1967: 9), coinciding with the birth of the modern hospice movement, as detailed in Chapter 2. This "open awareness" acts as a shift toward providing patients and their families with knowledge and control over their death trajectory.

3.2.2 Dying with Panache

The emergence of the modern hospice movement shifted how death and dying were viewed, bringing the concept of a "good death" into focus. Early on, a consensus

around what constituted a “good death” was relief from pain and symptoms and support for psychological, emotional, social, and spiritual needs. Typically, all-encompassing the term “dignity”. Since the start of the 21st century, there has been scrutiny regarding the definition of dignity, with some arguing that it should also encompass the need for assistance from others and not be solely focused on autonomy and control (Walters, 2004). Empirical research on the topic has only begun to appear in the last few decades. Providing a clearer idea of a “good death” from the perspective of those involved, from nurses and physicians to patients and families. However, evidence had uncovered differences in opinions among the groups (De Jong and Clarke, 2018; Meier *et al.*, 2016). A literature review by Meier *et al.* (2016) found that protecting dignity was an essential element of a “good death” from the families’ perspective (70%) but less so from the patient’s perspective (55%). This patient perspective contradicts previous research that patients highly value dignity (Meier *et al.*, 2016).

A study by Chochinov (2002) highlights that palliative care patients reported feeling a burden to others and being treated with respect and understanding significantly related to their sense of dignity. Many nurses expressed a “bad death” as not respecting the patient's wishes, while some physicians felt that a patient's refusal to take medication to control pain leads to a “bad death” (De Jong and Clarke, 2018). Several commonalities were found to contribute towards a “good death,” including receiving preferred treatment, maintaining dignity, gaining acceptance from family members, being prepared for death, reflecting on past experiences, resolving any unresolved issues, fully embracing life, experiencing a good quality of life during the dying process, having honest and open communication, reconciling relationships, being able to say goodbye, being free from pain and suffering, receiving support until the end of life, and not dying alone (De Jong and Clarke, 2018; Jeffers and Kenny, 2009; Meier *et al.*, 2016). Conversely, some commonalities contributing to a “bad death” were: loss of control and independence, feeling like a burden on others, and physical and psychological pain (De Jong and Clarke, 2018). Ultimately, “the period between the diagnosis and death can be one of chaos, fear, and bewilderment. However, it can also be a time of restful peace, encouraging thought, and

overpowering love. Individuals can forgive and be forgiven, give and receive thanks, address regrets, take care of unfinished business, discuss spiritual issues, and take advantage of the opportunity to express sincere, heartfelt, gentle goodbyes. This is the ultimate goal of patient-centred care" (Jeffers and Kenny, 2009: 107-108). However, for those not experiencing dying, it could be easy to misconstrue the connotations of "good"; one does not need to be "happy" about dying or be forced into a place of "serenity". A clarity to the "good death" was an alternative phrase offered by Walters (2004): "dying with panache". Perhaps with humour, protest, complaint, or awkwardness but with integrity and honesty. Most importantly, in their own way (Walters, 2004).

3.3 The Benefits of Control

As healthcare facilities are not places people choose but need to go to, they can induce anxiety (Dellinger, 2010). Concerns are exacerbated by "Increasing media attention about hospital-acquired infections, medication errors, and other safety lapses" (Kanter and Horowitz, 2009: 216). This was evidenced in end-of-life care, where most people prefer to die at home (Nilsson *et al.*, 2017) 2018 figures show that 42.5% of people with cancer die in hospitals, with 19.6% in hospices and 7.5% in other institutions - leaving only 30% to achieve the majority's preference of dying at home (Public Health Scotland, 2020). It is, therefore, pertinent that people feel as comfortable and "at home" as possible within a healthcare setting, where a sense of control could play a large part. On the other hand, the feeling of not having control or efforts to control a situation and continually failing can result in "learned helplessness", which may result in abandoning all attempts, as any action is perceived to have no effect (Bell *et al.*, 2001: 113).

One increasingly common design feature that attempts to achieve control is the change from shared to single-occupancy inpatient rooms. Single inpatient rooms have been shown to have many benefits over shared rooms: eliminating the need to transfer patients for gender or roommate incompatibility issues; improving patient safety by reducing falls; reducing hospital-acquired infections; and increasing patient satisfaction (Hendrich, Fay and Sorrells, 2002; Montague and Sharrow, 2009; Ulrich

et al., 2004). Conversely, research has also shown single rooms can increase levels of social isolation, especially in older patients. A study by Singh *et al.* (2016) of adults over 65 years old found that patients felt significantly higher levels of loneliness in single rooms than in multi-bedded wards. Following admission, patients reported feeling less isolated in multi-bedded than before admission but showed they felt more isolated in single rooms.

3.3.1 Environmental Control

Patients can often lose control over parts of their lives within healthcare environments. Having the ability to control environmental aspects can provide psychological relief. Temperature, lights, window coverings, televisions, room configuration, display and storage areas should all be freely accessible and alterable by patients (Montague and Sharrow, 2009). Brager, Paliaga and De Dear (2004: 32) state, "it is critical that buildings be designed so that occupants can be active participants in the indoor climate feedback loop, not simply passive recipients of whatever thermal conditions the building management system delivers". Studies show that those with greater personal control over environmental conditions such as temperature and ventilation report less discomfort (Raja *et al.*, 2001). Personal control of environmental conditions includes access to blinds, variable lighting, or an openable window (Karjalainen and Lappalainen, 2011; Raja *et al.*, 2001). The previously mentioned study by Andrade and Devlin (2015) highlights that controllable environmental elements can be complex, challenging or even stressful to understand: "if user controls are ambiguous in intent, poorly labelled, or fail to show whether anything has changed when they are operated, then the systems that lie behind are unlikely to operate effectively or efficiently" (Bordass, Leaman and Bunn, 2007: 8). Karjalainen and Lappalainen (2011) findings show complex user interfaces can lead to frustration and suggest they should focus on simplicity. Effective training on building system control operation was found by Day and Gunderson (2015) to increase satisfaction with indoor environments. In turn, leading to overall increased productivity and health performance. Šujanová *et al.* (2019: 21) state, "[t]he difference between available and perceived control can have a major impact on user satisfaction". Therefore, users must first understand how to control or manage the

building system controls to achieve that perceived sense of control.

3.3.2 Lighting

Visual elements related to light can impact wellbeing (Al horr *et al.*, 2016), such as lux levels, glare, and colour rendering (Kolokotsa *et al.*, 2007). Natural lighting can create a welcoming and open atmosphere (Montague and Sharrow, 2009). As well as natural light, artificial lighting can play a significant role in comfort and wellbeing, with softer light being preferred over standard fluorescent fixtures (Anderson, 2007). Hospital light levels, typically large bright fluorescent ceiling fixtures, are suitable for cleaning and general patient care. However, an excessive amount of light for everyday non-clinical activities contribute to psychological and physical stress for patients. Distress can be associated with too high and too low light levels; too bright can lead to headaches, nausea, and increased stress levels. In contrast, the latter can induce fatigue and depressive mood (Montague and Sharrow, 2009). Corridors that are solely lit with direct lighting can result in uneven light distribution, creating a sharp contrast between dark and light areas, which may give the impression of a cramped or sombre space. This can lead to discomfort due to glare and residual spotting, especially for patients who are being transported in a bed. To avoid these issues, a combination of direct and indirect illumination should be used in the corridor design (LaHood and Brink, 2010). Designers can employ various lighting types that can be altered to suit various activities, such as reading or displaying artwork (Montague and Sharrow, 2009).

3.3.3 Indoor Air Quality

Indoor air quality (IAQ) within healthcare facilities can impact people's health and wellbeing (WHO, 2010). Poor IAQ within buildings can lead to discomfort, a negative perception of air quality, and physical symptoms such as headaches and lethargy. These adverse health effects can particularly affect vulnerable people, children, older people, and those living with illness (Settimo, 2017). Brager, Paliaga and De Dear (2004) studied naturally ventilated office buildings, finding those with more personal control within their environment were more tolerant of conditions outside their comfort zone. Reporting personal perceptions of the “ideal comfort

temperature" could be influenced by personal control; those with more control (preferably an openable window) stated temperature preferences that aligned more closely with the mean operative temperature. There were few complaints about drafts concerning air movement, but people could sense relatively low airspeeds. Preferring greater control over this allowed them to maintain comfort levels (Brager, Paliaga and De Dear, 2004). Similar findings in a study by de Dear and Brager (2001) show that those in a naturally ventilated building, compared with centralised mechanical ventilation, are more satisfied and responsive to the indoor climate (i.e., clothing adjustment).

3.3.4 Noise

Noise can be one of the most detrimental environmental factors, leading to miscommunication, sleep disturbances, changes in social behaviours, and even potentially physiological changes in the body: all factors which can impact healing (Berglund *et al.*, 1999; Montague and Sharrow, 2009). Noise is inescapable within healthcare facilities, but too much noise causes a disturbance, and too little leads to isolation and feelings of loneliness. Sometimes, noise can be viewed as a positive, as it is a reminder of activity and life (Anderson, 2007). However, uncontrollable noise often adversely affects people's moods and wellbeing (Glass and Singer, 1972). There was clear evidence that high noise exposure, especially uncontrollable noise, can increase agitation and decrease productivity (Glass and Singer, 1972; Levy-Leboyer, 1982; Moser, 1988; Sherrod, 2006). Reducing a noisy environment is essential in establishing a healing environment (Montague and Sharrow, 2009). Therefore, it is necessary to consider the relationship between "noise-producing spaces" and "sound-critical spaces" sensitive to noise. Adding an acoustic buffer space can reduce noise transfer; such a buffer might be provided by corridors, lobbies, storage rooms, stairwells, or stores (Egan, Hass and Jaffe, 1997).

3.4 Social Support

Ulrich (2001: 54) describes social support as "emotional support and tangible assistance that a person receives from others". He highlights the lack of evidence on

how healthcare design can facilitate or hinder access to social support, with some only focused on specific samples such as patients in psychiatric units or care homes residents. There was limited research that correlates increased social interaction in healthcare facilities with reduced stress or wellness promotion. A sense of control can also come into play within this theory component, with patients being able to control a level of interaction with other patients or their visitors to ensure positive instead of stressful interactions. Creating a supportive environment is not limited to patients but extends to visitors and staff. However, consideration should be given to the "conflicting needs or orientations" of the various users (Ulrich, 2001: 54).

3.4.1 The Importance of Healing Partnerships

Staff and patients are involved in the healing process, but families, friends, and the community can play a vital part (Montague and Sharrow, 2009). Relationships can positively contribute to quality of life. In healthcare, patients communicating openly with family and staff is essential to improved wellbeing (Cohen and Leis, 2019). Access to various gathering spaces can foster positive interactions and communications essential to providing social support, reducing distress, and accelerating healing. Designing a welcome and comfortable entrance is integral to this concept, supported by various areas designed for socialisation, quiet contemplation, and private conversations. For example, many facilities opt for a "greeter" instead of fixed information desks, who offer assistance and directions without people standing in a queue (Montague and Sharrow, 2009).

Volunteers are a powerful resource in shifting towards a person-centred health care system, but one that is often under-utilised. They enhance the care provided by healthcare professionals by supporting patients, their families, and staff. They can provide additional information to patients and families about the services they can access and play a crucial role in the environment. Designing an attractive and welcoming environment can encourage volunteers' engagement (Harrison, MacKean and Cullivan, 2009). 100 staff and 700 volunteers make up the PPWH hospice team. With the volunteers making up over 87% of the hospice team, their engagement with the services was an invaluable asset in the PPWH "mission to provide consistently

high standards of care and service to patients and families" (The Prince & Princess of Wales Hospice, 2019: 14). Since the beginning, volunteers have been an integral part of the organisation, operating a volunteer-led telephone support line in 1985. People volunteering their time to the services would amount to around £950,000 per year if the service were paid (The Prince & Princess of Wales Hospice, 2019).

Family-centred care, first defined in 1987, was the premise that family members contribute to the patient's healing process. General considerations are for facilities and staff to:

- Empower families to become partners and decision-makers in their loved one's care;
- Respect and consider the unique values, beliefs and religious and cultural backgrounds of all families, as well as their individual needs and preferences;
- Provide information that allows families to make informed decisions and effectively care for their loved ones;
- Create a trusting and collaborative environment with families; and
- Identify and support patients' and families' social, developmental, and emotional needs.

(McCullough, 2010)

Elements that contribute to the facilitation of these goals can include dining areas, dedicated space between patient rooms, spiritual and meditation areas, 24-hour visitation, decentralised nurse stations, internet access and adequate waiting areas (McCullough, 2010). Purposefully designed waiting areas help to reduce stress and increase privacy for visiting families (Dellinger, 2010). Incorporating family zones within bedrooms can also increase social support (Dellinger, 2010); support was shown to positively impact a patient's health (Brady and Conway, 2009). Another important gathering area can be a family dining space with comfortable chairs and tables for an unhurried dining experience (Montague and Sharrow, 2009). Although the perspective of patients and families is essential when designing a healing environment, staff needs should also be considered (Stichler, 2001). Ulrich (1991: 54) found that hospitals designed to be attractive and supportive to patients often

overlook staff areas. On his visits to these hospitals, he noted that to deliver "high quality care, it is critically important to attract and retain high-quality healthcare personnel". Patients' families feel that the patient-staff relationships could impact a patient's dignity level (Enes, 2003). However, staff working within palliative care is faced daily with life-threatening conditions, and palliative care often requires more time and attention than traditional curative treatment (Ablett and Jones, 2007; Whippen and Canellos, 1991). Palliative care staff with higher stress levels were seen in environments lacking social support, not being involved in decision-making, and unmanageable workloads (Vachon, 1995). Research has shown a correlation between employee satisfaction and patient satisfaction (Kaldenberg and Regrut, 1999) and between poor staff wellbeing and burnout with a deterioration in patient safety (Hall *et al.*, 2016). Research by Maben (2013) highlights a relationship between staff wellbeing and patient outcomes, with "perceived organisational support" and "good organisational climate" being two of the seven staff variables linked to good patient-reported experience. Elements conducive to positive staff wellbeing include access to comfortable break areas, food making facilities, natural daylight, views of nature, and space for socialising and laughing with colleagues without being overheard by patients or families (Montague and Sharrow, 2009). Even the inability for staff to briefly escape work demands reduces a sense of control (Ulrich, 1991). Nurturing and supporting staff allows them to be "present as inspiring healers" for patients and families (Montague and Sharrow, 2009: 168).

In some studies, the physical layout of the environment is of particular importance within a healthcare setting. For example, one study shows the location of the nurse station can reduce staff fatigue, increase contact time with patients, improve communication, give more accessible access to medication, and provide space for respite from stress (Ulrich *et al.*, 2004; Ulrich *et al.*, 2008). Therefore, having a well-designed environment, albeit not physically providing the care, can facilitate the delivery of this care and impact the wellbeing of those who use the facilities. The ward layout has been an essential aspect of healthcare environments since Ancient Greece (Thompson and Goldin, 1975) or the "nests" of Neolithic settlements. One of the current debates in healthcare are between centralised or decentralised units and

single or multi-bedded rooms. There is an ongoing debate about the benefits of centralised versus decentralised workstations. A centralised nurse station serves as a key information hub for the entire unit, whereas a decentralised environment has smaller workstations interspersed throughout the unit. Centralised units are often a noisy hub of activity from having in-store documents, staff socialisation and patients or families going there to find staff. If staff members take their break in this area, they can be perceived as not working. One large nurse station, separated from patients by half-walls or glass screening, can be perceived as staff being inaccessible or too busy. Decentralised units are closer to the patients, located outside or inside the rooms. There is typically a window that allows for the passive observation of patients. There is less noise because it is not a gathering point for multipurpose activities (McCullough, 2010; Montague and Sharrow, 2009). Hand washing sinks can decrease hospital-acquired infections if working facilities are inside the rooms. A disadvantage is that a decentralised environment can mean more frequent trips to storerooms, which can mean stockpiling nearer the patient's bedroom, leading to items being placed in inadequate areas. Therefore, sufficient localised storage near the patient room should be considered, leading to less waste and clutter (McCullough, 2010). In the early Planetree facilities, introduced in the previous Chapter, nurse stations were tables and chairs in a central open space, entirely accessible to patients. This feature facilitated a collaborative environment with open dialogue between staff, patients, and families on health and healing. Within modern Planetree facilities, clusters of 4-6 bedrooms form a unit with either a small staff space or an individual workstation directly outside the bedroom. These layouts keep staff close to patients and make them feel more accessible. In addition, importance should be given to a central workstation used for clinical discussions or confidential work (Montague and Sharrow, 2009).

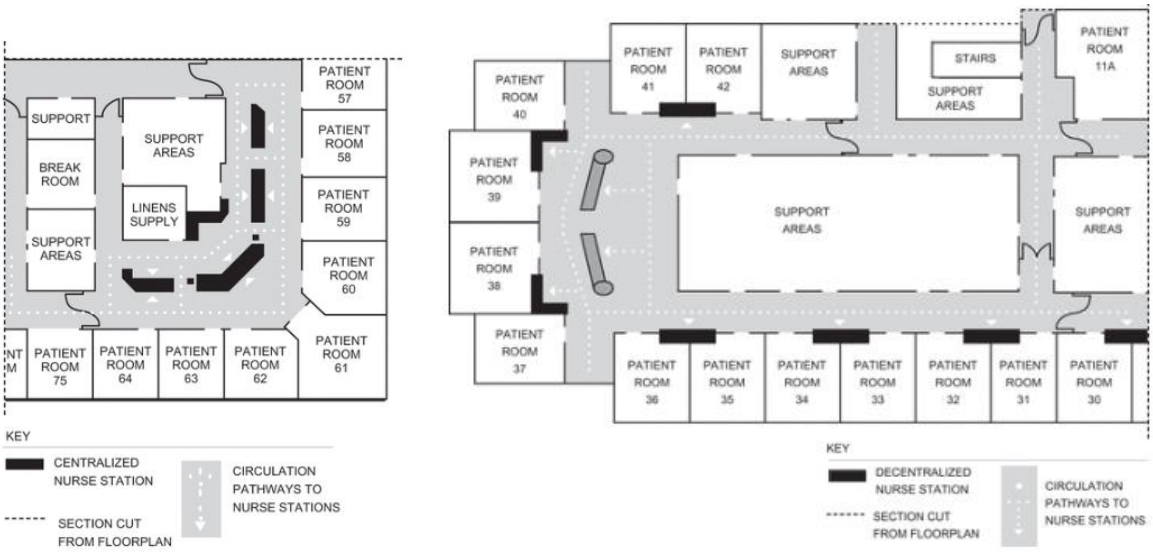
A study by Tyson, Lambert and Beattie (2002) included interviews with 16 nursing staff from a rural psychiatric hospital, comparing new decentralised acute wards to the previous centralised ones and asking participants to describe the advantages and disadvantages. The old long-stay ward was open and comprised 31 patient beds. The new ward had a 16-bed unit comprising four self-contained groups of single ensuite

bedrooms with small seating areas. The new acute ward had 28 beds, eight in a secure area, containing two single rooms, two double rooms and four four-bedded rooms, each with an ensuite. These additionally benefited from access to a dining room, a sitting/TV room, an activities room, and an externally furnished veranda. The old acute ward was a 32-bed unit. Although not a closed unit, the door was often locked to prevent "wandering". According to the study, nurses had a positive view of the new wards due to their pleasant appearance, increased benefits for patients (especially privacy and personal space), and positive effects on morale and creating a therapeutic atmosphere. However, some drawbacks were noted, including issues with general design (such as lack of smoking rooms and cramped facilities), increased difficulty in patient observation, and feelings of isolation among staff, which were partly due to understaffing. It is important to note that the study considered both the physical environment and organisational procedures. Hence, the findings reflect both factors, exemplified when participants discuss organisational issues and problems (Tyson, Lambert and Beattie, 2002). Feelings of staff isolation were found in a study by Zborowsky *et al.* (2010); in comparison to centralised units, there was a significant reduction in consultations with medical staff and social interactions in decentralised units. Suggesting a "hybrid" model between the two would address the negatives, such as introducing a centralised meeting room for consultations.

A pre–and post-survey measuring the impact of the move from centralised to decentralised nursing units (see Figure 3-4) by Real *et al.* (2018) found differences in responses between staff and patients. Findings from patients showed a preference towards the decentralised units due to larger single bedrooms, increased privacy, confidentiality, quietness, and overall satisfaction with the design. The quieter environment and larger rooms offer an increased ability to communicate and allow for private discussion with families and patients, offering opportunities for relationship building, empathy, and increased patient satisfaction. Nursing staff were satisfied with the decentralised units' aspects, such as the patient rooms, unit environment, and noise levels. However, they reported reduced access to support spaces, lower team/mentoring communication levels, and less satisfaction with design than in centralised units. Overall, nurses were more positive about centralised

units, and patients were more positive toward decentralised units.

Figure 3-4 IPU centralised unit (left) and de-centralised unit (right) (Real et al., 2018, p27-29).



3.5 Positive Distraction

The third element of the Theory of Supportive Design is possibly one of the most varied in terms of what constitutes a positive distraction. A belief running through the evidence is the premise that the "evolutionary development of humans in natural and social environments has left its mark on our species in the form of unlearned predisposition to pay attention, and respond positively to these specific types of content and elements" (Ulrich, 1991: 102). Ulrich states that the most effective positive distractions are those inherent within human evolution: happy laughing, caring faces, animals, and nature. Recent theories suggest positive responses are related to a combination of evolutionary and biological influences and learned behaviours such as cultural conditioning. Contrastingly, environments can inadvertently contain negative distractions, "environmental elements that assert their presence, are difficult to ignore, and are stressful" (Ulrich, 1991: 105).

3.5.1 The Entrance: First Impressions

A study by Leather *et al.* (2016) reviewed "intuitively informed interior design changes" to a waiting area brought about by relocating a neurology clinic from a

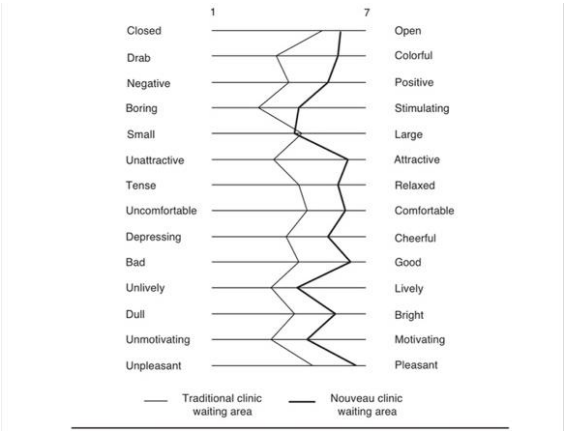
shared outpatient department to a dedicated one within the same hospital complex. 145 neurology outpatients assessed either the pre-move traditional waiting area or the post-move "nouveau" waiting area. Comparisons of the two designs can be found in Figure 3-5. The findings showing the new environment was associated with more positive environmental appraisals, improved mood, altered physiological state, and greater reported satisfaction. Although this study focused on the entire waiting area and cannot identify individual design elements, it highlights that no structural changes are required to achieve environmental quality. Still, simple changes to interior design features such as lighting, colour scheme, and furnishings significantly contribute to environmental quality. Interestingly, the authors state that the senior consultant took the relocation opportunity to design the waiting area to be less "clinical and intimidating" and more "supportive" for patients (Leather *et al.*, 2016: 849). This suggests that not only designers but those in the medical profession see a benefit to good design and can influence positive changes.

3.5.2 Feeling Valued

Patients expect high-quality care regardless of setting, so a healthcare facility's finer details and aesthetics can improve the patient experience. Aesthetics is one of the most non-quantifiable aspects of EBD. However, aesthetics can set the tone, provide an effortless distraction, and reinforce the quality of the care received (LaHood and Brink, 2010). These are supported by a study by Campos Andrade *et al.* (2013) finding that perception of environmental quality impacts satisfaction with physical

Figure 3-5 Design attributes of traditional and Nouveau wating areas (left table) and Perceived Environmental Quality of traditional and Nouveau wating areas (right graph) (Leather et al., 2016, p850)

Design Feature	*Traditional*	*Nouveau*
General layout	Square plan; enclosed reception area; files and paperwork visible from waiting area	L-shaped plan; open-plan reception area; no files or paperwork visible
Color scheme	Magnolia & dark brown; no color coordination	Grey and pink tones; color coordination
Floor covering	Red, patterned, flat carpet	Lilac, pile carpet
Curtains	Flimsy, window-length	Heavy, full-length
Furniture	Plastic-covered, blue-grey benches and armless chairs	Fabric-upholstered, deep blue, armless, wooden chairs
Lighting	Fluorescent strip lighting	Wall-mounted fixtures
Walls & pictures	Cork notice-boards	Wall-mounted nature photography; wooden paneling
Plants & flowers	Small, wall-mounted, dried flower arrangements	Free-standing, ceramic-potted indoor plants
Reading material	Large piles of easy-reading magazines (e.g., Woman's Own)	Selection of glossy magazines (e.g., Homes & Gardens)
Medical information displays	Leaflet carousels & information boards	None
Windows	Metal-framed, clear glass; view onto adjacent hospital buildings	Metal-framed, clear glass; view onto adjacent hospital buildings
Noise	No music or television; noise from waiting patients, staff, and telephones	No paging system or television; noise from waiting patients, staff, and telephones



environmental conditions. Patients' perceptions of higher quality physical conditions correlate with higher environmental quality. Inpatients' perception of social environment quality mediates the relationship between objective environmental quality and satisfaction, whereas, for outpatients, this was influenced by their perception of the physical environment. The authors speculate that these findings are due to inpatients' reliance on medical and nursing care provided by others, leading to significant development of interpersonal relations. In comparison, outpatients spend less time within the environment and, therefore, might have a more "fleeting" experience, which places more importance on the aesthetic qualities of an environment (Campos Andrade *et al.*, 2013: 1). A selective and refined interior design palette can establish a calm space that is tangible. The coordination of textiles throughout the interior can affect people's experience in the space (LaHood and Brink, 2010). Designers often specify permanent materials, such as hardwood flooring, door finishes or stones, to anchor the design. They are often accented with easy to replace materials such as paint, upholstery, and textiles. Well-chosen furniture can reinforce a project's guiding principles, establishing a comfortable and supportive environment that fosters collaboration and interaction. Consideration is given to use, durability, accommodating various needs, and enabling the delivery of the desired atmosphere (LaHood and Brink, 2010).

3.5.3 Colour Theory

There was no clear evidence that specific colours impact differently on patient outcomes or staff productivity (Tofle *et al.*, 2004); most current guidance and design decisions are based on personal belief (LaHood and Brink, 2010). Experience of colour is subjective, influenced by layers of experience, including perception, cognition, and physiology. Therefore, the choice of colour should examine environmental considerations such as response to culture, time, and location (Young, 2007). A study by Dijkstra, Pieterse and Pruyn (2008a) explored the impact of inpatient bedroom colours on individual differences. Individual differences were determined by Mehrabian (1977) stimulus screening ability, the ability to reduce the complexity of an environment (high-screeners) with fewer arousal responses to environments; this compares with those not capable of this information reduction

(low-screeners) who experienced higher arousal. Findings show that, compared to white bedrooms, those with orange walls had marginally significant effects on arousal, and green walls had a positive but no significant effect on stress reduction. However, results for both were more pronounced for people scoring low on stimulus screening. Findings additionally showed that this effect appears to be mainly caused by the increase of stress experienced by participants in the white room, as opposed to the hypothesised stress-reducing properties of green. Similarly, with orange, the effects were mainly related to the drop in arousal for low-screeners in the white room. This study was conducted with 87 students with a mean age of 20, which might not accurately represent hospitalised patients. However, the author demonstrates that the "neutral colour" white may have distinct impacts on stress and arousal and that people's abilities to screen out information may be reduced due to their current medical conditions, concluding that the influence of colour could be of greater importance. Particular attention should thus be paid to the effects of the colour white, which is neglected in most colour research. Their results indicated that white might not be neutral but might impact some people who were more sensitive to their environment (Dijkstra, Pieterse and Pruyn, 2008a: 9).

3.5.4 Familiarity

As illustrated in the previous section by Young (2007), designing to respond to the demographic population, context, and culture can establish a thriving healing environment. Integrating cultural aspects such as indigenous colours and patterns allows people to relate the environment to their day-to-day lives and feel more comfortable. Adopting elements of the surrounding environment also enables the integration of the facility into its context (Dellinger, 2010). Reference to context assesses the safest place and familiarity, which can be achieved by incorporating regional artwork (LaHood and Brink, 2010). Taste can vary between older and younger generations, and consideration should be given to this (Dellinger, 2010). Personal experience and people's subjective meanings of architecture will determine individual behaviour and response—subjective meaning dealing with feelings, emotions, attitudes, and evaluations (Hershberger, 1970). A review paper by Kotradyová (2019: 17) states that "Cultural identity and tradition are inseparable

parts of every society"; they greatly influence our material world, often establishing the foundations of a country or region's "design language". Wellbeing can also be closely attributed to socio-cultural aspects. Attachment to place can be achieved by a personal ability "to personalize, mirror and extend the self /ego into the occupied space" (Kotradyová, 2019: 21). "The known" is the cultural building from "shared patterns of behaviours and interactions, cognitive constructs, and affective understandings learned through the process of socialization" (Kotradyová, 2019: 22) allowing for people to feel safe and secure within a space, with the body almost functioning on "autopilot" which relaxes the nervous system.

3.5.5 Engagement with the Environment

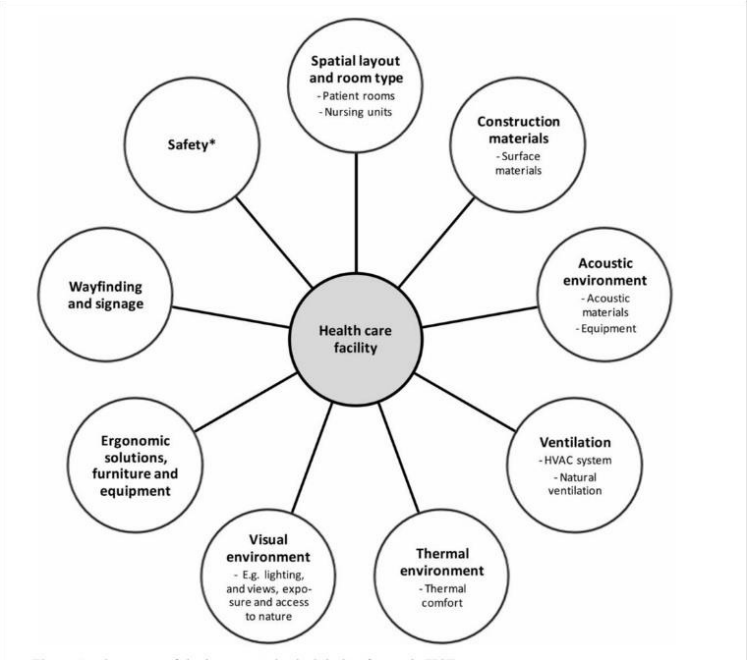
Incorporating positive distractions offers focus, inspiration, stress reduction, and even a connection to humanity. Diverting attention, if even momentarily, and eliciting positive emotional responses. "A fireplace can create a warm ambience, and fish tanks or water features delight people of all ages. These elements, coupled with the sounds of soft piano music, work in harmony to create a comfortable environment of care" (Montague and Sharrow, 2009: 164). Integrating unique "wow" features can turn a negative or dull experience into something tolerable and possibly even enjoyable. These frequently fall into three categories: features, artworks, and nature; they can include gardens, sculptures, patterned interior design elements and bespoke furniture. These are most notably facilitated by integrating art from paintings, sculptures, and photography (Dellinger, 2010; LaHood and Brink, 2010). Art creation can be perceived and relatable as an inherently human endeavour and viewed with wonder and warmth. Where "architecture puts materials together for a function, art is, in and of itself, created solely for someone else to look at and enjoy" (LaHood and Brink, 2010: 24). As artwork can be open to interpretation if a patient already has a negative frame of mind, their interpretation may be frightening, exacerbating this negativity (Friedrich, 1999). Viewing abstract art can be frustrating as people attempt to interpret and understand it. Equally, if there is a defined human subject, it can lead to patients drawing comparisons between themselves and the subject. For example, if the painting is a woman with long flowing hair and the patient has recently lost hair, it could be perceived as disheartening and lead to a

negative state of mind (LaHood and Brink, 2010). Therefore, artwork should not be chosen based on artistic merit but on how its intended audience perceives it (Ulrich, 2009).

3.5.6 Design Features

A literature review by Salonen *et al.* (2013) on the environmental impacts of healthcare facilities on health and wellbeing found that the most beneficial design elements for all user groups were: single-bed patient rooms, safe and easily cleaned surface materials, sound-absorbing ceiling tiles, adequate ventilation, thermal comfort, natural daylight, control over temperature and lighting, views, exposure and access to nature, and appropriate equipment, tools, and furniture (see Figure 3-6). However, findings additionally highlighted the difference that design elements such as lighting (artificial lighting levels) and layouts (centralised versus decentralised) have on different user groups, i.e., between patients and staff. Therefore, consultation across all users and a multidisciplinary design team would be integral to designing for human needs and functioning, with adaptability for future use (Salonen *et al.*, 2013: 1). Gao and Zhang (2021) report findings from 150 inpatients in a Chinese

Figure 3-6 Physical design features identified through a literature review to be of important within healthcare facilities (Salonen et al, 2013, p5).

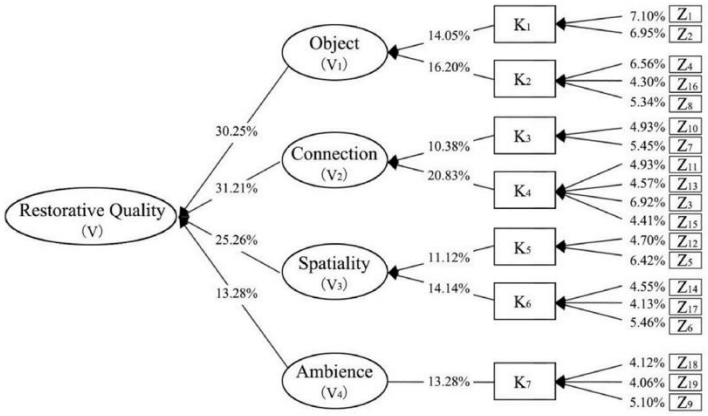


hospital show that 19 out of 27 identified design characteristics[4] significantly contribute to a restorative ward environment (see Figure 3-7). The most influential characteristics being reported as nature, artwork, doorway position, furniture layout, room size, and wall colour. Seven sub-dimensions were determined: ornamentation, furniture, interaction, component, scale, decoration, and ambience. As illustrated in Figure 3-7, "Object" (i.e., ornamentation and furniture) and "Connection" (i.e., interactions and positioning of items) were found to be the most significant dimensions that influence the restorative quality of the ward environment. The authors highlighted that designers and management should consider these environmental characteristics and dimensions to foster wellbeing. However, it is essential to note the cultural differences which could impact perceptions of restorative qualities (Gao and Zhang, 2021: 1).

Figure 3-7 19 identified design characteristics which correlate with restorative environment (Gao & Zhang, 2021).

The classification of the restorative characteristics of ward environments.

Object (V_1)		Connection (V_2)		Spatiality (V_3)		Ambience (V_4)
Ornamentation (K_1)	Furniture (K_2)	Interaction (K_3)	Component (K_4)	Scale (K_5)	Decoration (K_6)	Ambience (K_7)
Nature (Z_1)	Furniture layout (Z_4)	Privacy (Z_{10})	Doorway size (Z_{11})	Room height (Z_{12})	Wall material (Z_{14})	Natural light (Z_{18})
Artwork (Z_2)	Furniture amount (Z_{16}) Furniture type (Z_8)	Cleanliness (Z_7)	Window position (Z_{13}) Doorway position (Z_3) Floor material (Z_{15})	Room size (Z_5)	Wall pattern (Z_{17}) Wall colour (Z_6)	Ventilation (Z_{19}) Humidity (Z_9)



[4] the 27 design characteristics identified by a prior literature review including odour, temperature, humidity, ventilation, noise, natural light, artificial light, wall colour, Wall pattern, wall material, floor material, room size, room height, room shape, room layout, window position, window size, doorway position, doorway size, furniture type, furniture amount, furniture layout, artwork, nature, personnel density, cleanliness, and privacy.

3.5.7 Journey and Wayfinding

The ability to navigate an environment independently can lead to a greater sense of control and help reduce stress levels. It is recognised that even the process of traveling to a health facility can generate fear and anxiety. Initial impressions of a healthcare facility can be influenced by something as simple as the ease of finding the entrance. Therefore, entrances such as the main and the service entrances should be easily differentiated (Montague and Sharrow, 2009). Facilitating a process of inclusive wayfinding made accessible to various people, languages, and disabilities can ensure a stress-free experience. This can be achieved through layering cues, such as signage, landmarks, maps, information stands, shapes, colour, texture, light and sound (LaHood and Brink, 2010). A minimum level of signage to locate primary areas and routes should be enough for effective wayfinding within healthcare facilities. To further aid wayfinding, designs can reduce the number of entrances, incorporate windows along corridors and elevator lobbies to assist with orientation, create distinctive features for each entrance, and establish landmarks. These memorable architectural features may include skylights, windows, artworks, sculptures, seating areas, gathering spaces, or special accent lighting at intersections (Montague and Sharrow, 2009). Views of nature at the end of corridors and full-length windows can help people retain a sense of orientation within the space (Dellinger, 2010).

Wayfinding is further enhanced by spatial organisation, such as zoning and establishing clear sightlines from vantage points, with destination areas directly accessible from main lobbies or corridors (LaHood and Brink, 2010; Montague and Sharrow, 2009). An important consideration is the separation of patients and visitors: movement from auxiliary areas that support the building functioning, such as deliveries, staff, cleaning supplies, rubbish, and the movement of bed-bound patients. In addition, differentiating between public and private spaces, such as private access that blends into corridors, can eliminate the need for negative signage (Montague and Sharrow, 2009).

3.6 Engaging with Nature

Another notable change within the new facility is its location in Bellahouston Park, providing a unique opportunity to consider a comprehensive landscape proposal. This feature was extensively explored within the landscape design by Erz, who established a holistic proposal that perfectly aligned with the architectural ambitions of the project and established unique and engaging spaces for those who use the building. As the organisation addresses the importance of nature and landscape design one of the critical areas of focus was how the building, including the Sengetun, interacts with the outside.

3.6.1 Deeply Rooted Connections with Nature

"Biophilia" was a term first introduced by social psychologist Fromm (1964: 45) where he describes the concept as an entire way of being and "love of life (…) manifested in a person's bodily processes, in his emotions, in his thoughts, in his gestures". According to Fromm's socio-ecological analysis, biophilia was the result of humans' non disruptive relationship with the environment, based on the presence of three essential requirements: security, justice, and freedom" (Totaforti, 2018: 3). The concept was later popularised by biologist Edward O Wilson (1984), defining it as "the connections that human beings subconsciously seek with the rest of life" (Wilson, 1984: 350). The biophilic theory states that humans have an intrinsic connection to the natural world because of millions of years of evolution. Wilson (1984) believes humans are genetically programmed to respond positively to nature. This connection with nature is seen to originate from the evolution of our species and the benefits that a specific environment held for humanity's pre-historic survival (Gifford, 2007; Kaplan and Kaplan, 1989) "where the human mind originated and is permanently rooted" (Wilson, 1984: 139). Nature is synonymous with wellbeing and survival within early humanity. This theory suggests that these traits have been genetically passed down the generations, harbouring an instinct to be attracted to nature (Appleton, 1975; Kaplan and Kaplan, 1989; Orians, 1986; Ulrich, 1983; Ulrich, 1993; Ulrich *et al.*, 2008; Wilson, 1984). These connections with nature provide physical, mental, and behavioural benefits such as lower blood pressure,

reduced anxiety and stress, enhanced attention and concentration, improved social interaction, and less hostility and aggression (Kellert and Calabrese, 2015). Browning, Ryan and Clancy (2014) suggest the evidence underpinning biophilia is frequently linked to three "mind-body systems":

- cognitive functioning relates to mental agility, memory, creativity, and logic, strengthened by research into mental restoration of nature showing the ability to reduce or reverse cognitive fatigue;
- psychological response, both learned and hereditary, relates to adaptability, alertness, attention, concentration, emotion, and mood. Research on emotional restoration and stress management of nature improves these responses; and
- physiological response relates to aural, musculoskeletal, respiratory, circadian systems and overall physical comfort. Design can act as a buffer to stressors prior to them having a negative impact. Evidence has shown improvements with encounters in unknown but information-rich spaces with elements of risk or wonder.

An article by Totaforti (2018) highlights the cultural shift within design, particularly healthcare design, to focus on reconnecting people with the patterns and processes of nature. In the article, she argues there was a lack of "innovative architectural design that looks at how spaces […] affect the daily actions of residents and visitors, and that is capable of supporting the well-being of patients through the attention to multisensoriality and the integration of natural elements" (Totaforti, 2018: 7-8). This is especially true for modern healthcare architecture, as expressions of cultural and social values and space of function. However, being able to merge the two successfully is difficult in practice, as the standards and protocols for medicine require sterile and efficient spaces, often having greater priority ahead of designing for patients' emotional needs. Healthcare designs focus on space humanisation relevant to current culture and a desire to reconnect humans to nature, but she states that there was no defined typology, therefore making it hard to define a clear identity and role of the healthcare institution from the public perspective.

3.6.2 Biophilic Design

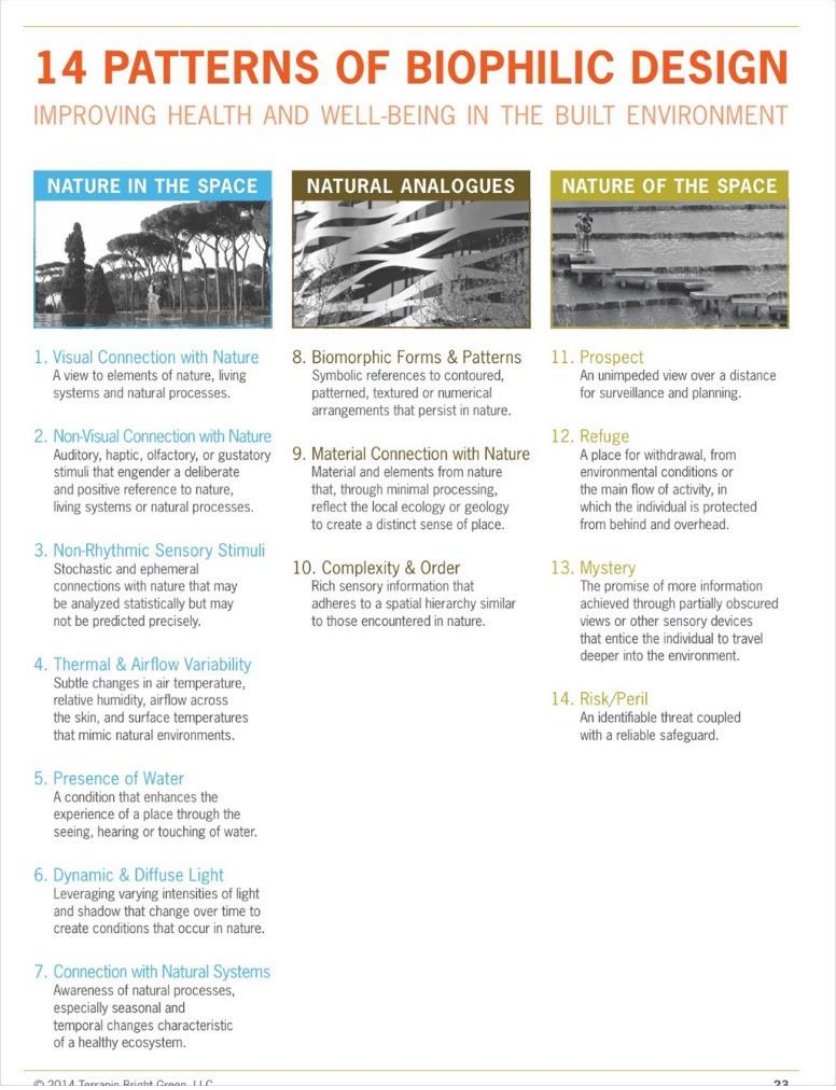
Salingaros and Masden (2008: 74) believe that "what it essentially means to be human is lost in the practice of architecture today, and that the denial of human nature acquired greater authority at the turn of the twentieth century, coinciding with the rise in scientific and technological applications". The authors argue that humans have an inherent need to process information from their environment, but contemporary architecture often lacks natural elements, resulting in designs that are out of touch with our natural inclinations. They propose that incorporating the concept of biophilia, which suggests that humans require exposure to natural forms for their physiological and psychological well-being, could improve the architectural education system. Biophilia is rooted in human evolution and our natural environment, and it refutes the idea that modern humans can detach themselves from nature without consequences. The authors suggest that biophilia can help explain why people benefit from being in natural environments and that traditional architecture often employed biophilic principles, even though they may not have been consciously aware of it (Salingaros and Masden, 2008).

A 2004 Conference and subsequent biophilic design book publication (Kellert, Heerwagen and Mador, 2008) aim to translate biophilia from a hypothesis to a tangible technique for the design of the built environment. This publication provided over 70 mechanisms for evoking a biophilic experience. It defined a framework for understanding and incorporating three categories of biophilic design into architecture: Nature in the Space, Natural Analogues, and Nature of the Space (Browning, Ryan and Clancy, 2014). Browning (2012) considered these three concepts as underpinning biophilic design. The first refers to a built environment incorporating direct nature features such as vegetation, water, and animals; the second refers to nature expressed within materials and patterns; and the third refers to psychological and physiological responses evoked by various spatial configurations. Examples of these spaces were demonstrated in "design concepts of prospect and refuge" (Browning, 2012: 8) such as protected spaces with elevated views, spaces that harbour enticement and risk, the ability to explore and discover new space, and an element of "pleasurable distress" (Browning, 2012: 2). A subsequent publication,

“14 Patterns of Biophilic Design” by Browning, Ryan and Clancy (2014), builds on this work by synthesising biophilic design approaches and their flexible applications in the built environment, most notably highlighting the benefits to the multiple levels of human health and well-being (See Figure 3-8). They recognise that the empirical evidence supporting biophilia design could be viewed as “just corroborating the rediscovery of the intuitively obvious” (Browning, Ryan and Clancy, 2014: 52). However, even with awareness of the benefits of nature, it can be frequently overlooked within modern design (Browning, Ryan and Clancy, 2014). Totaforti (2018: 8) brings awareness to the multifaceted aspects of biophilic design, asserting that it was “not only about integrating plants into the built environment (for example,

green walls, green roofs, plants in rooms, etc.) but consists of a more complex experience". Biophilic design can be even more critical today, with a study by Klepeis *et al.* (2001) showing most people spend approximately 90% of their time indoors. A previous study by Ott (1989) also highlighted that 92% of employed people in the US spent their time indoors. This suggested that the findings highlighted that "we are basically an indoor species" and that "in a modern society, total time outdoors is the most insignificant part of the day, often so small that it barely shows up in the total" (Ott, 1989, as cited in Klepeis *et al.*, 2001: 233). It is clear, therefore, that the general shift in modern culture is tapering away from a connection to nature.

Figure 3-8 Browning et al. (2014: 26) 14 patterns of biophilic design.



Juxtaposing biophilia is both biophobia, a fear of nature or living things (Ulrich, 1993) and ecophobia, an unreasonable aversion to natural forms or places. While the former is seen as related to a genetic response, both are learned responses inherited from personal experience, culture and education, and even architectural education (Salingaros and Masden, 2008). This response must be acknowledged, and designers should consider these areas to be accommodated. Ulrich (1993) suggests that people develop fears based on either their own experience or through the influence of those around them. One interesting aspect of human culture and communication is that we learn of natural dangers without being personally endangered. This may be a factor in determining why certain landscapes and natural environments strike some people with fear and others with awe. Typical triggers of these responses can include "spiders, snakes, predators, blood, and heights – elements that either directly threaten or signal danger through humanity's evolutionary path" (Browning, Ryan and Clancy, 2014: 17). This is related to one of the 14 biophilic features identified by Browning, Ryan and Clancy (2014) as improving connection with our natural environments. This is the Risk/Peril feature, comprising a threat and an element of safety (see Figure 3-9). Therefore, a predisposed negative response can be transformed into "one of curiosity, exhilaration and even a type of mind-body systems recalibration" (Browning, Ryan and Clancy, 2014: 20).

Figure 3-9 An example of the risk/peril feature of biophilic design (Browning et al., 2014, p. 54).

3.7 Environmental Preference

Humans have established a biological affiliation towards specific restorative natural environments from the functional-evolutionary perspective. However, research suggests we have not developed the same response to urban environments, as these have only been experienced by a few generations (Bell *et al.*, 2001). Kellert and Wilson (1995) propose that our preferences for certain views and aesthetics can be traced back to points of reference that promote our survival. For instance, flowers are a sign of healthy plant growth and signal the availability of resources in the future. Orians and Heerwagen (1992) further suggest that we have a genetic predisposition towards preferring savanna environments over other types, such as tropical forests. This idea is known as the "Savanna Hypothesis," which posits that the tropical African savanna was the birthplace of humanity (Balling and Falk, 2016; Joye, 2007; Orians and Heerwagen, 1992). "The savanna environment provided the essentials for human survival: food, trees for protection from predators and the elements, and long, unobstructed views from which to observe both predators and prey" (Lohr, 2007: 2). The savanna environment is enhanced by the presence of certain elements such as

open space, trees providing shade, water, a diverse understory of flowers and forbs, peaceful grazing animals, and signs of human habitation. The Savanna Hypothesis suggests that humans may have a genetic predisposition to prefer this particular combination of environmental features (Orians, 1986; Orians and Heerwagen, 1992). The unobstructed view of the hypothesis has connections to the biophilic design element created by Browning, Ryan and Clancy (2014) of Prospect. Relating to "an unimpeded view over a distance for surveillance and planning" (Browning, Ryan and Clancy, 2014: 47). The space should be designed to feel open and freeing but still impresses a sense of safety and control, which is particularly important when feeling vulnerable and in unfamiliar environments. This feature was based on research on "visual preference and spatial habitat responses, as well as cultural anthropology, evolutionary psychology and architectural analysis. Health benefits are suggested to include reductions in stress, boredom, irritation, fatigue and perceived vulnerability, as well as improved comfort" (Browning, Ryan and Clancy, 2014: 47). According to Herzog and Bryce (2007), people prefer distant views (beyond 100 feet or 30 meters) over shorter views (less than 20 feet or 6 meters) as it provides a better sense of awareness and comfort, resulting in reduced stress responses, especially when alone or in unfamiliar environments (Petherick, 2000). Good prospect is extensive and information-rich, with a savanna-like view (Browning, Ryan and Clancy, 2014: 47).

The Savanna Hypothesis could explain the desire to move to the suburbs, with the suburban lawn acting as a savanna feature. Ulrich (1983; 1986) found that people prefer environments that include water, depth, a degree of complexity, focal points or patterns, uniform or even ground conditions, and elevation change, adding curiosity. Ulrich's criteria, such as distant views, fruitful biomass and meat production, changes in elevation, and scattered trees, align with the characteristics of the savanna environment as proposed by the Savanna Hypothesis. Furthermore, Orians and Heerwagen (1992) found people prefer space that aids travel and wayfinding without being overexposed or obstructing vision (Bell *et al.*, 2001). Experience within a place can also enhance our preference for similar environments, "personal interaction with these places over a lifetime creates a wealth of knowledge and meanings that provide the basis for emotional attachment to places" (Orians and Heerwagen, 1992: 560).

This can be seen in a study by Balling and Falk (2016), where the preference towards savanna environments was especially true for children, but adults had a more varied preference for other biomes due to their lived experience. Although this experience could influence preference, it did not override the presumably innate responses from children. If this generalised bias towards savanna exists, Orians and Heerwagen (1992) suggest people don't require experience to respond positively to this setting. Interestingly many studies on environmental preferences actively exclude animals from photographs as they are suspected to enhance preference scores (Orians and Heerwagen, 1992). A commonly mentioned architectural example containing the principles of the Savanna Hypothesis was Frank Lloyd Wright's iconic Johnson-Wax building (Browning, 2012; Soderlund and Newman, 2015). Designed in 1936, it is an open space protected from the elements under a large forest canopy, which could evoke the biophilic reaction of attachment and refuge (Browning, Ryan and Clancy, 2014); and could explain, much like the case with Alto's sanatorium in the previous chapter, why the building remains unchanged today.

3.7.1 Restoring Attention

According to Attention Restoration Theory (ART) proposed by Kaplan and Kaplan (1989); Kaplan (1995) exposure to nature can help restore focus and improve the negative effects of mental fatigue and stress (Hartig, Mang and Evans, 2016; van den Berg *et al.*, 2010), through supporting attentional functioning (Kuo and Sullivan, 2016). ART works by directing attention away from a specific task and towards something that requires minimal mental effort before returning to the original task with restored attention. To provide this restorative effect, the environment must provide a feeling of immersion and engagement while capturing effortless attention, providing escapism or distraction from the everyday (Kaplan and Kaplan, 1989; Kaplan, 1995). Kaplan and Kaplan (1989: 195) claim that "an extended encounter with the natural setting may more readily provide restorative benefits, but the nearby natural setting provides many of the opportunities, though less intensely. A sense of being away, of being related to some larger context and soft fascination are certainly achievable in the nearby setting".

Numerous studies have demonstrated that exposure to nature can help alleviate stress and contribute to the healing process. Many people have personally experienced the calming and tension-reducing effects of viewing or being in natural environments (Montague and Sharrow, 2009). In fact, scientific research has shown that simply looking at nature can significantly reduce pain. This is often attributed to distraction theory, which suggests that when individuals are engaged or diverted by pleasant stimuli, they experience less conscious attention towards their pain, resulting in reduced discomfort (McCaul and Malott, 1984: 139). Bell *et al.* (2001) state that visiting natural environments or even looking at a photograph of nature can have a restorative effect, reducing physiological stress and agitation and restoring energy and health. To establish a restorative environment, four factors can play an important role: fascination, coherence, sense of being away, and compatibility with inclinations and goals (Kaplan and Kaplan, 1989; Parsons, 1991; Ulrich, 1991). Kaplan and Kaplan (1989) suggest that nature, in the form of clouds, sunsets, and tree movement, holds a real fascination for humanity, reducing the impact of stress. In addition, natural settings provide an environment to support human functioning, where people can manage information effectively, allowing them to move freely and explore with comfort and confidence. These types of environments can help in the process of recovery from mental fatigue and help tired individuals regain normal human functioning (Kaplan and Kaplan, 1989). They further deduced that "the play of light on the foliage, the patterns created by long shadows, the different moods of a nature oasis with changes in weather and season, all combine aesthetics and interest in a way that leaves room in the mind for other thoughts as well" (Kaplan and Kaplan, 1989: 193). A review by Gillis and Gatersleben (2015) highlights the research that explores that a restorative environment does not need to be natural. A study by Ouellette, Kaplan and Kaplan (2005) looked at a monastery as a restorative environment using ART as a framework and found that the monastery served as a restorative experience. With "soft fascinating" effects of the architecture being the main restorative element identified.

Reviews by Neilson *et al.* (2019) and Joye and Dewitte (2018) were critical of ART, identifying the gaps in the current evidence. The most common criticisms where the

central theoretical assumptions are vague, under-defined conceptually, challenging to measure scientifically, and empirical research often fails to test the theory adequately. It shares similarities with the biophilic and Savanna Hypothesis in that its origin is speculated to be rooted in our evolutionary history and is a primal response. Joye and Dewitte (2018) state it is difficult to define specific environmental characteristics that produce this "restorative" response—highlighting that determining these characteristics would benefit the theory's use in practice. Neilson *et al.* (2019) suggest understanding the contributing variables and research into manipulating the visual variables, and their impact on restoration could progress this area. Restoration studies often lack a control group to compare results; therefore, the ability to tangibly measure the restorativeness of an environment renders results less convincing. The characteristics and impact of "soft fascination" were often mentioned as integral to restoration effects due to its ability to capture effortless involuntary attention without adding to attentional capacity. Examples given by researchers were "clouds, sunsets, snow patterns, the motion of the leaves in the breeze" (Kaplan, 1992: 139), or waterfalls, caves and fires (Kaplan and Kaplan, 1989). However, empirical research often only focuses on a particular landscape, such as forest or vegetation, rather than specific individual elements. This was supported by a review by Gillis and Gatersleben (2015), finding that the current evidence for restorative environments was currently dominated by greenery. In addition, Joye and Dewitte (2018) suggest that it was difficult to isolate the restorative factors of nature scenes because urban and natural environments differ on many dimensions, making it challenging to quantify the reasons for participants' responses to a particular image. Additionally, the studies often do not measure the necessary level of exposure to achieve a restorative effect, including factors such as the size, intensity, and duration of the stimulus.

3.7.2 The Three Levels of Engagement

According to Pretty (2006), there are three levels of engagement with nature:

- Viewing nature through a window or an image in a book;
- The presence of nature nearby, such as walking or reading outside;

- And active participation and involvement with nature, such as gardening or farming.

All three of these are discussed in the preceding sections.

3.7.2.1 Bringing the Outside In

For centuries, Asian and Western cultures intuitively believed that viewing nature could promote calm, be stress-reducing and improve overall health (Ulrich *et al.*, 1991). Recent research empirically supports these claims, with access to nature shown to impact a patient's quality of life, with views of nature from a window beneficial for reducing pain and improving mood (Ulrich, 1984; Ulrich *et al.*, 2008). Recent studies show visuals of nature, especially images of water, have a more beneficial influence on the psychological state than the urban environment, producing more positive responses in stressed individuals and positive effects on emotions such as sadness and fear (Ulrich, 1986; 2007). Views of nature, such as a garden or exposure through art, can elicit an emotional response in the patient that can help alleviate stress and pain (Ulrich, 2006). Nature scenes, especially water, focus and hold attention more than urban scenes; this would be especially beneficial to those who experience low arousal and under-stimulation, such as patients who feel isolated, a trait which can lead to depression (Ulrich, 1983; 2007).

There can be many barriers and limitations to accessing the outdoors (Cohen and Leis, 2019), especially within healthcare environments, where patients might spend increasing time indoors as they become more unwell. Therefore, views of nature from windows should be incorporated into the building design, and the hospital beds should be arranged in such a way as to provide a direct view from a window (Malenbaum *et al.*, 2008). One of the patterns of biophilic design identified by Browning, Ryan and Clancy (2014: 27) was "A Visual Connection with Nature", illustrated as "a view to elements of nature, living systems and natural processes". Browning, Ryan and Clancy (2014) went on to reference research by Kahn Jr *et al.* (2008), who found that views of nature through a window were superior to that of the same view through a digital screen (e.g., video/plasma tv). Suggesting an element

contributing to this is that, with screens, there is no parallax shift for people as they move toward or around objects, Browning, Ryan and Clancy (2014: 28) noting "[t]he human brain exploits the parallax to gain depth perception and estimate distances to objects. In a healthcare environment, stress levels can be elevated for patients, visitors, and staff; viewing nature outside or at least scenes of nature in artwork can relieve anxiety. Bedrooms with views of nature can elicit positive emotions and reduce stress by distracting patients from focusing on their pain. The provision of windows in staff areas aids orientation concerning the time of day and weather conditions, which improves wellbeing (Dellinger, 2010). Balconies or terraces allow people to access outside and its benefits without directly leaving the building (Cooper Marcus and Barnes, 1995; Francis and Cooper Marcus, 1991; 1992).

"[I]nterior designers often get requests to "bring the outdoors inside" to create a connection with nature" (LaHood and Brink, 2010: 24). Sustainably designed buildings could prove crucial in establishing this "outdoors inside" aesthetic and have been shown to improve the satisfaction of the people who use the facility. This is attributed to; improved air quality, connection with nature, adequate natural light and views, and an improved perception of the work environment (Heerwagen, 2010). Natural lighting plays a crucial role in establishing this connection. However, natural light can significantly impact temperature levels and glare, which are often difficult to control (LaHood and Brink, 2010). Good levels of natural light benefit health by establishing a normal circadian rhythm and providing vitamin D absorbency (Beauchemin and Hays, 1996). This can regulate sleep cycles and control emotional volatility (Challis, 2011; LaHood and Brink, 2010; Ulrich *et al.*, 2004), reduce depression, stress and pain and medication use while helping achieve a shorter recovery time and length of hospital stay (Beauchemin and Hays, 1996; Malenbaum *et al.*, 2008; Ulrich *et al.*, 2004; Ulrich, 2006; Walch *et al.*, 2005). Indoor and outdoor areas containing plants or views enhance social interaction, which is associated with organisational attachment (Wittmann, 2010). Apart from the psychological and physical health benefits, day-lighting can reduce the need for electric lights, decreasing cost and increasing the energy performance of the building (Evans, 1997).

A longitudinal quasi-experiment study by Raanaas, Patil and Hartig (2012) involved 166 heart patients and 112 lung patients at a rehabilitation centre in the mountain village of Røros, Norway. There were three window views measured: (1) panoramic with an unobstructed view of the valley and mountains, with no buildings blocking the view; (2) partially blocked with a view of the landscape by parts of the centre and/or other buildings; and (3) blocked with the view to the landscape entirely blocked by other parts of the centre, although natural elements such as grass could be seen. Their findings show that an unobstructed bedroom view of natural surroundings appears to have improved self-reported physical and mental health. The positive effect was more prevalent in lung patients' mental health than heart patients. The author speculates that the symptoms of lung patients being increased fatigue and breathing difficulties means they might spend more time indoors. Additional findings show patients with a panoramic view of nature reported using the room as a place to withdraw to a greater extent. Such withdrawal can help patients cope emotionally (Raanaas, Patil and Hartig, 2012: 1). This need for "Refuge" was a pattern identified by Browning, Ryan and Clancy (2014) as "is a place for withdrawal, from environmental conditions or the main flow of activity, in which the individual is protected from behind and overhead" (Browning, Ryan and Clancy, 2014: 49). Lowered ceilings typically characterise the manifestation of these indoor spaces. For example, in areas with standard ceiling heights, this would be approximately 18-24 inches below the main ceiling (Browning, Ryan and Clancy, 2014: 50).

An example of the benefits of bringing manifestations of nature physically inside was exemplified in a study by Dijkstra, Pieterse and Pruyn (2008b). He presented 77 students with a scenario describing hospitalisation with a possible legionella diagnosis with two photos: one showed an inpatient room containing indoor plants; the other showed no plants but an urban environment (see Figure 3-10). Those exposed to the room with indoor plants reported less stress than those in the control condition. The stress-reducing effects were related to a higher perceived attractiveness of such environments. The authors state that establishing a more attractive environment can create a healing environment that contributes to the health and wellbeing of patients.

Figure 3-10 Photos of inpatient bedrooms with and without plants used in an experimental study (Dijkstra et al., 2008b, p. 2).

3.7.2.2 Engagement with Nature, Access

Ulrich *et al.* (2020); Ulrich *et al.* (1991) find that natural settings are frequently reported as places people seek when feeling troubled, upset, or grieving. People tend to seek growth in a natural environment, either the chance to develop themselves or discover what the environment has to teach (Gifford, 2007). They also elicit positive associations or memories from the past, suggesting that personal experience and cognition play a vital role in the restorative effect (Ulrich *et al.*, 1991), an idea linked to the previous section on environmental preferences. Hartig and Marcus (2006) state that an essential aspect of a healing garden was the "absence of features that diminish the ability to enjoy and reflect on the surroundings—noise, crowds, threats, unwanted demands on attention" (Hartig and Marcus, 2006: 36). Gardens can provide an area of solace, so it can be beneficial to provide private benches for use (Montague and Sharrow, 2009). Studies have shown that gardens within health

facilities give access to the tranquillity of nature, which can be therapeutic to end-of-life care patients and reduce agitation and aggression among dementia patients (Triggle, 2016). Within outdoor environments, consideration of space for stress relief and mental renewal for staff should be given to provide areas for self-reflection and socialisation, achieved through purposeful planting and hedges to provide a natural privacy barrier (Naderi, 2008).

Walking in a green area can produce lower levels of frustration, engagement and arousal and higher levels of relaxation, whereas moving from green space to urban areas creates a heightened sense of engagement (Aspinall *et al.*, 2015; Roe *et al.*, 2013). A study by Pasanen *et al.* (2018) deviated from the standard image research and investigated the impact of active environmental engagement on improved mood and restoration. The experiment consisted of three groups asked to walk at their own pace along a predefined route for 4-6 km, following the path laid out by markers and instructions. One group was given "no task" during the walk, and two groups were assigned signposted tasks throughout the route related to "restoration-enhancement". One group was assigned to complete these in the "theory-based order", and one group to complete these in reverse order. The instructions on the signposts were based on stress reduction theory by Ulrich (1983); Ulrich *et al.* (1991), "favourite place" studies by Pasanen *et al.* (2018) and Korpela and Ylen (2009), and ART by Kaplan and Kaplan (1989). The study related to the direction that "a restorative experience has been suggested to start with physiological relaxation, followed by affective and mood-enhancing responses, and advance to building an affective relationship with the place and reflection on one's current situation in life" (Pasanen *et al.*, 2018: 5). The study was replicated in two field settings, one of a coniferous forest (study 1) and one of an urban park (study 2). The route contained "three signposts related to physical relaxation and observing the environment (for example, "[. . .] Keep looking around and let yourself be enchanted by your surroundings. Keep breathing peacefully."), the next two to "favourite place" identification and reminiscence ("Find your favourite place in this area (. . .) Choose a detail by which you may remember this place, perhaps for years."), and the final two to clearing the mind and life reflection ("Look around for something representing you or your

current situation in life (. . .) Are you gaining new thoughts?")" (Pasanen *et al.*, 2018: 5).

The findings from the two studies show that self-reported mood-related outcomes, valence, and restoration, had a similar positive change. In addition, they found that improved sustained attention reduced commission errors. There was no documentation on the duration of these effects after the task's immediate completion or the potential benefit of repeating these walks. The authors speculate that repeated exposure and engagement with the natural environment could produce "place attachment" and "favourite place" establishment, as explored by Pasanen *et al.* (2018), thus leading to added restoration of the tasks. The findings suggest the benefits of stress reduction and sustained restoration tasks co-occur. This was exemplified by the recovery from the stress exercise before and during the experiment. However, the same results on nature exposure without tasks were unclear. The authors conclude that, although they have shown "engagement with the environment can be a relevant facilitator of attention restoration", other "tasks or forms of engagement could promote both attention and affective restoration more effectively, or, consistently". This study could align with the biophilic pattern of "Mystery" identified by Browning, Ryan and Clancy (2014) as "the promise of more information achieved through partially obscured views or other sensory devices that entice the individual to travel deeper into the environment" (Browning, Ryan and Clancy, 2014: 51). These characteristics facilitate a sense of anticipation. "offering the senses a kind of denial and reward that compels one to further investigate the space" (Browning, Ryan and Clancy, 2014: 51), rooted in Kaplan and Kaplan (1989) idea that a fundamental requirement of an engaging environment is the ability for it to be understood and explored, being achieved ""from one's current position" to achieve this sense of mystery" (Herzog and Bryce, 2007 as cited in Browning, Ryan and Clancy, 2014: 51).

A meta-synthesis review by Cooley *et al.* (2020) included studies on outdoor therapy, ranging from sitting or walking in a park to wilderness expeditions. Excerpts from the studies frequently mention the confines of indoor rooms limiting the

explorations of clients' emotional states. The benefits of outdoor therapy bring a disconnection from technology, the feeling of being connected to nature or something larger, and the opportunity to become “more physically active, in tune with their bodies, emotions and behaviours” (Cooley *et al.*, 2020: 10). Additionally, studies show that it forms a deeper holistic connection between the client and practitioner. An interesting insight was practitioners commenting on the physical movement of walking, often tuning into the clients’ rhythms, producing a physical manifestation of empathy. Conducting therapy outdoors enhanced “the therapeutic relationship through a greater shared ownership of space and a more balanced power dynamic” (Cooley *et al.*, 2020: 11). The review suggests that outdoor therapy had been successful in not only helping clients connect with nature, but also in enhancing the therapeutic experience by providing new ways to integrate traditional therapy techniques, promoting mutual understanding and wellness for both the client and practitioner (Cooley *et al.*, 2020). It is crucial to consider the outdoor therapy approaches individually, using a person-centred approach to determine the client's requirements. However, there are currently many limitations to achieving outdoor therapy in health services, with a preference toward “traditional Cartesian clinical approaches, more aligned to a reductionist, biomedical model of treatment” (Cooley *et al.*, 2020: 11). Traditional Western models of talking therapy were developed during rapid growth in urbanisation and the post-industrial revolution almost 150 years ago (Jordan, 2014; Roszak, 1992). Cooley *et al.* (2020) conclude that given the current evidence on innovative approaches to therapy, it may be time to reconsider the traditional models. “In the words of the founder of ecopsychology (i.e., the study of humans’ relationship with earth), conventional therapies “seek to heal the alienation between person and person, person and family, person and society” whereas therapy outdoors had the additional objective of healing “the more fundamental alienation between the person and the natural environment” (Roszak, 1992: 320 as cited in Cooley, 2020 #2019).

3.7.2.3 Green Prescribing

Our response to nature and our environments is influenced by innate and learned components (Balling and Falk, 2016; Miyazaki and Tsunetsugu, 2005). Lohr *et al.*

(2004), Lohr (2002), and Lohr and Pearson-Mims (2005) highlighted a particularly strong influence is childhood interactions with nature: findings that increase in childhood interaction with trees, plants, and nature lead to more positive attitudes towards these, as adults. Active interaction, such as picking flowers, provided a stronger response than passive engagement, such as visiting a park. This response had been found in people from various demographic and ethnic backgrounds (Lohr, 2007: 2). Along with access to a garden, simple gardening tasks have been shown to reduce stress and anxiety and improve physical attributes such as balance, reducing falls in older people. Physical exercise had been shown to reduce stress and provide feelings of restoration, so accessible outside space can be hugely significant (Phiri, 2014). Similarly, contact with nature and sunlight had been found to enhance emotional functioning (Heerwagen, 2010). Positive emotions can correlate with increased creativity and cognitive "flow", a state of being fully immersed in a task (Wittmann, 2010). "Creating something with one's own hands while being in a state of flow is a further important part of wellbeing… [and] contributes to socio-cultural comfort" (Kotradyová, 2019: 27).

Ecotherapy is a healing process related to nature which aims to lessen the degrees of illness, dysfunction, and alienation: "enabling people to deepen their sense of connectedness with nature may also help them overcome other dimensions of alienation in their lives" (Clinebell, 1996: 63). Simply put, it can reconnect people with nature, in both its external reality and their sense of self in the natural world (James, 2014). Its benefits can be seen within social prescribing initiatives and non-clinical referral options that deal with social or emotional problems within healthcare organisations. These prescriptions encompass everything from volunteering in gardening to art groups and walking schemes. Evidence suggests that volunteering benefits physical and mental health, bringing stability, improving self-esteem, and reducing social isolation (Triggle, 2016). A report for the King's Fund placed social prescribing, community gardens and volunteering as critical areas of consideration for future health and social care strategies (Buck, 2016). Contact with nature and gardening can benefit emotional, social, physical, vocational, and spiritual spheres: reducing stress, depression, and anxiety; restoring attention; increasing fitness level

and nurturing social relationships (Clatworthy, Hinds and M. Camic, 2013). Gardening creates opportunities for people to get a sense of connectedness or experience a historical connection to past generations, as “many gardeners feel a relationship to a force or system that is larger than they are and that is not under human control” (Kaplan and Kaplan, 1989: 191). Scientists have discovered certain bacteria naturally occurring in soil, which can boost serotonin and reduce anxiety in lab mice at a microbiological level, hypothesising that working with plants and soil could have the same effect on humans (Montgomery, 2013).

3.8 Conclusion

It is apparent that to achieve excellence in person-centred care, the environment should be designed for not only the patient but also for staff, volunteers, and families. The evidence within this chapter highlighted why this is important and how it can be achieved through various aspects dedicated to the support of everyone involved in the caring process. A comprehensive, evidence-based design knowledge base exists for healthcare facilities. Due to this existing body of knowledge, the theoretical framework for this study was informed through a combination of Ulrich (1991) Theory of Supportive Design, evidence from a desktop review and a Pilot Study of the organisation. This chapter documented the literature collected throughout the study, informing the thesis's empirical research findings and forming the basis of the discussion chapter. The term “theory” can contextualise various things and have different meanings depending on the discipline or research approach. Generally, it provides background and explanation for the research topic, as detailed in Chapter 5. For this study, as the facility's design was specifically tailored to the organisational values and vision, it was apparent that any pre-defined theories might limit the findings; therefore, designing a theoretical framework based on its own merits would be more sufficient. Therein is why this chapter does not follow a strict theory. It, instead, introduced other theories, such as biophilia and Attention Restoration Theory (ART), as the new facility established a relationship with nature that could never have been achieved in their previous facility. The next chapter details the conceptual framework and introduces building evaluation tools. It culminates in

explaining the wellbeing framework used to inform data collection.

Chapter 4
Conceptual Framework

This chapter is a continuation of the literature review, building upon the introduction of evidence-based design (EBD) in the previous chapter and finalising the conceptual framework that guides the rest of this study. The topic is explored in the context of both academia and architectural practice. The chapter focuses on building evaluation studies and their methodologies: informed by a scoping review. Building evaluation studies, typically in the form of a post-occupancy evaluation (POE), are a valuable tool for documenting lessons learned from design projects. The focus is often on quantitative methods, evaluating the performance of the building in terms of energy, cost expenditure and client satisfaction with most failing to capture and accurately portray the environment from the perspective of those using the space. This can often cause the building to function inefficiently and lead to dissatisfaction among everyday users. Not acknowledging and addressing significant issues can contribute to the project's failure, leading to expensive re-designs or adaptations. Combining EBD with existing building evaluation methodologies could overcome these limitations. The conclusion of this chapter, therefore, establishes a Hospice POE Toolkit which supports the conceptual framework by mapping the key variables and features that guide the study. The aim being to holistically evaluate the PPWH person-centred environment predominantly from the perspective of those who use the building.

4.1 What is Reliable Evidence?

In healthcare, decisions and improvement strategies are typically based on scientific

empirical evidence. Randomised controlled trials (RCTs) are the most meticulous research design for evaluating interventions (Evans, 2003). However, traditional scientific methods can be challenging to apply out-with a controlled clinical setting. Environmental evaluations within healthcare are often directed towards positive outcomes in the efficiency and effectiveness of curing or medically treating illness. The needs of the staff and organisation take priority over patients and families: “the desire to create a healing environment [can be] easily subjugated to the priority of curing disease and stabilizing physiologic systems” (Day, Carreon and Stump, 2000: 87). Although important, focusing on clinical outcome measures alone can mean positive aspects of the environment that potentially improve quality of life could be overlooked (Day, Carreon and Stump, 2000).

Unlike the healthcare field, design guidance does not always require empirical evidence to justify implementing its recommendations (Day, Carreon and Stump, 2000). It was often based upon the experience of designers or organisations themselves (Weisman, Calkins, & Sloane,1994, as cited in Day, Carreon and Stump, 2000). Historical and vernacular architecture was built on centuries of design “trial and error”, and therefore one could argue “tried and tested', with techniques being developed that could be equated to “empirical” research (Hamilton, 2014; Sharpe, 2018a). Habraken (1997: 267) points out: “[o]f all the professional fields, architecture is where the virtue of a knowing-by-doing is most readily accepted by its practitioners”. Salingaros and Masden (2008) echo this fact stating that “architects and urbanists throughout history sought and achieved adaptivity through their intuition. Traditional architectural training was aimed primarily at developing this intuition”. They went on to state that only recently have we been able to utilise “scientific knowledge to explain processes that were until now somewhat mysterious, and thus vulnerable to subversion” (Salingaros and Masden, 2008: 136). This was also highlighted by Peters and Verderber (2017) who state some within the architecture profession believe empirical evidence generated by others, especially from other disciplines, can stifle creative intuition and experience. As architects often work on precedent, many of their design decisions are based on lessons learned, replicating what worked well and avoiding what did not. Therefore, “architects and

builders didn't need to wait for research confirmation of what experience had shown to be common sense" (Hamilton, 2014: 141). Day, Carreon and Stump (2000) concurs with Hamilton's perspective and argue that certain undeniable truths, such as the positive impact of privacy and autonomy on quality of life, do not necessarily require validation from traditional empirical research.

They suggest "the power given to empirical methods at the expense of other ways of knowing contributes to the moral distress healthcare providers experience when space is not given to important healing practices that cannot be demonstrated to contribute to quantifiable outcomes specified by empirically designed research" (Day, Carreon and Stump, 2000: 88). They emphasise the need for healthcare providers to align their values and intentions with their practice and environment to promote healing, even if such actions cannot generate specific measurable outcomes. However Day, Carreon and Stump (2000) acknowledge the usefulness of empirical evidence in resolving conflicting design recommendations, particularly in situations with significant or controversial impacts on quality of life and cost-effectiveness.

4.2 The Place of EBD in Architecture

Unlike other professional disciplines, such as medicine or law, architecture does not formally establish a shared common knowledge base or develop a tradition of practice-based user research (Duffy, 2008; Habraken, 1997). Many believe this was a significant oversight deeply rooted within the education system (Brandt, Chong and Martin, 2010; Duffy, 2008; Habraken, 1997; Salingaros and Masden, 2008). Today "the accredited master of architecture degree leading to licensure in the United States does not have much emphasis on research skills" (Kirk Hamilton, 2020: 28). Research methods and evaluation in graduate and doctoral education are minimal in the North American and UK architectural education systems (Kirk Hamilton, 2020). Salingaros and Masden (2008: 167) argue that "[w]ithout a knowledge base grounded in the reality of human perception and science, architecture remains open to corruption and is prey to the whims of ideology, fashion, and the cult of the individual. Making allowances for the inherent differences between architecture and science as disciplines, there are many lessons to be learned through the immediate

juxtaposition of their intellectual structures". Evidence of this was identified by Day, Carreon and Stump (2000: 398), stating that findings from much of the empirical research into dementia design, dating back to at least 1980, often "remain unknown among designers and facility administrators". This can be true from much of the research on health and wellbeing, potentially due to a lack of access, knowledge, or research skills. This was echoed in a report by the Royal Institute of British Architects (RIBA), finding few practices accessing academic journals that publish peer-reviewed scientific data; most accessing secondary industry literature such as planning policy and building regulations through places such as the Construction Information Services (RIBA, 2014). In the late 1960s, UoS and Markus *et al.* (1972) established a Building Performance Research Unit (BPRU) sponsored by RIBA. They operated between 1967 and 1971, with findings published in "The Architects Journal" and the book "Building Performance" (Chiu, 2014; Riley, Moody and Pitt, 2009). Markus *et al.* (1972: 229) felt that the BPRU evaluation ideas and techniques could not be replicated within mainstream architectural practice, as "often what is technical language to a research worker is jargon to a practising architect". They had identified an ever-widening gap between research and practice, suggesting there needs to be a fusion of both to produce successful projects and be driven by individuals, exemplified by the RIBA decision to omit Final Work Stage (M: Feedback) from the Plan Of Work in 1973 (Bordass *et al.*, 2004), something further explored later in this chapter. Even more recently, it was similar to Kirk Hamilton (2020: 27) stating, "few practitioners have the academic credentials to deal with research design and management at a high level". Succinctly articulated by Salingaros and Masden (2008: 135), "The gulf between what is real and what is imagined is so great by now that few ever attempt to bridge the distance. It is only when they graduate and step out into the real world that architecture students begin to emerge from their fantasy-based educational conditioning. For many this proves to be difficult if not impossible, and what follows for them is a career of frustration and misgivings".

Ulrich (1991: 97) states empirical research that focuses on design for psychological wellbeing and health can allow designers to "have more credibility in the medical

profession and carry greater weight with healthcare decision-makers" than by design derived from intuition alone. "Just as the art of architecture has always been paired with the science of physics and engineering, art and creativity are integral features of the best healthcare designs based on rigorous research evidence" (Hamilton, 2003: 20). Esther Sternberg, MD of the National Institutes Of Health, states a "happy balance can be established between intuitive design and technological advances, to improve health, mood, and cognition and to foster a sense of well-being in hospital patients and staff" (Sternberg, 2010: 252). Hamilton reflected that "his designer's intuition, knowledge of the client, and empathy for the patients had led him to a design solution that had, apparently entirely by coincidence, matched the research informed guidelines produced by a recognized scholar" (Hamilton, 2014: 142).

"[E]vidence-based design signals the dawn of a promising and hopeful era in healthcare architecture" (Hamilton, 2003: 26). EBD requires a fundamental shift in the way buildings are planned, designed, and operated. In many instances, projects can lack clear principles, aims, or measurable expected outcomes, with innovations being adopted or rejected without sufficient or credible evidence. EBD aims to resolve this by introducing a systematic approach to establish initial design principles, outlining goals to achieve these and predetermining measurable, expected outcomes. These are actioned throughout all project stages (Zimring and Bosch, 2008). Although viewed as controversial only a few decades ago, in recent years, EBD has become more mainstream and thus accepted within the industry (Kirk Hamilton, 2020). Hamilton (2003) published the "Four Levels Of Practice" in 2003, later revised in 2020 (Kirk Hamilton, 2020), a model for explaining different levels of integration of EBD within architectural practice. The levels are as follows:

- Level one practitioners aim to use literature to improve design and adopt evidence-based concepts but may fail to seek balanced feedback and access credible research (Hamilton, 2003, 2020).
- Level two practitioners develop a hypothesis and measure outcomes related to evidence-based concepts but must ensure that outcomes are measured to operate on an evidence-base (Hamilton, 2003).

- Level three practitioners share their results publicly, which may not be natural for a practice to do but could also identify practitioners as specialists and leaders in the field (Hamilton, 2020).
- Level four practitioners share results with academic sources and collaborate with social scientists to ensure rigor within findings, but not all projects need to aim for this level (Hamilton, 2003, 2020).

Hamilton (2003) suggests there are "level-zero practitioners" who understand the environment can impact people but with little evidence to support this. However, being less frequently occurring, according to the updated article (Hamilton, 2014). They might claim their design was evidence-based by taking isolated quotations from articles or presentations and making "a personal interpretation that fits their design bias" (Hamilton, 2003: 23). They rarely consult original research and cannot apply valuable measures for gathering results, leading to designs based on observed outcomes rather than an evidence base. However, being an evidence-based design practitioner does not require avoiding intuition or creativity. The most innovative projects are often based on imagination, experience, and intuition beyond best practice guidance. Hamilton states there was an essential missing element and that "the obligation for an evidence-based practitioner is to deliberately state the design hypothesis embedded within the intuitive decision, and to carefully measure the related outcomes" (Hamilton, 2014: 140). Notably, the missing aspect was sharing findings that can contribute to lessons learned applicable to future projects. Not only that, but if an eligible methodology was implemented, "the findings can be published to inform and advance the field" (Hamilton, 2014: 140).

EBD appeals to the scientific minds of physicians and other clinicians trying to practice based on medical evidence (Hamilton, 2003: 24). The Architect is crucial in translating research into a design that delivers intended project outcomes (Hamilton, 2003). Designers must be able to access the relevant literature and allow time for translating this into their designs. Examples of resources for EBD are included in Table 4-1. Hamilton (2003: 24) states that "while literature from the fields of medicine, nursing, management, engineering, industrial design, and technology are

helpful, the literature of psychology, sociology, anthropology, and economics are also relevant sources". A well-established design process and defined goals at the beginning can help filter the vast array of available information. Another area of complexity within a healthcare environment is materials, décor, and lighting. For example, architects might specify carpet and indirect lighting to contribute to a "healing environment", but within a clinical environment, this can lead to "carpeting that supports bacterial growth, wallcoverings that harbor pathologic organisms, poorly located hand-washing sinks that discourage good infection control, inappropriate abstract art, and inefficient support space for staff" (Hamilton, 2003: 24).

Table 4-1 Resources for EBD (Hamilton, 2003: 24)

Primary sources	Secondary sources	Emerging sources
science journals newspapers magazines documentary films television programs	industry data guides guidelines from speciality boards quality review data infection-control data manufacturers" testing information association reports documents of accreditation agencies and code authorities.	presentations workshops continuing education programs benchmarking tours of exemplary facilities

4.3 Building Evaluation

Over the past 50 years, POE has contributed a sustained effort toward comprehensively evaluating buildings (Preiser and Schramm, 1997). The technique involves measuring and obtaining feedback on the performance of buildings. This process is typically undertaken after project completion, covering aspects such as monitoring environmental conditions and establishing criteria to assess the design and sustainability, such as energy efficiency. USA case studies of university dormitories in the late 60s were among the first to systematically assess building

performance from the building users' perspective. Although not explicitly named POEs, the first publications with such a term only appeared in the mid-1970s. The first officially published were POEs of hospitals. POE became increasingly used throughout the 80s in the UK, Canada, New Zealand, Australia, and the USA—projects covering public buildings, government buildings and airports (Preiser, 2005).

More recently, Building Performance Evaluation (BPE), appearing in the mid-90s in published work by Preiser and Schramm (1997), presented an integrative framework, becoming a preferred method of holistic building evaluation (Chiu, 2014). The terms POE and BPE are closely related, and there is often confusion over the scope of each (Agha-Hossein, Birchall and Vatal, 2015). "BPE typically focuses on the performance of the whole building understood through a study and review of this constituent systems, with an emphasis on building physics. Conversely, POE focuses more on building operators and users and their perception of building operation, and how well it supports their needs and aspirations" (Fletcher and Satchwell, 2015: 40). BPE, a comprehensive approach to building evaluations, is embedded from the start of a project, whereas POE measures project outcomes after occupation (Agha-Hossein, Birchall and Vatal, 2015). Both can be implemented separately but achieve the greatest value when combined (Fletcher and Satchwell, 2015).

In a BSRIA guide of BPE in non-domestic buildings, Agha-Hossein, Birchall and Vatal (2015: 3) state, "[t]he actual performance of new or refurbished buildings can be very different to the design intent". Therefore, a BPE tool can be beneficial for informing the design team and clients about the performance of the building throughout the project. BPE focuses on the entire project process and performance of the building in use. In general, including feedback on;

- Building fabric
- Building services and operating strategies
- Energy use
- Handover and commissioning processes
- Occupant satisfaction

- Occupant comfort conditions.

(Agha-Hossein, Birchall and Vatal, 2015: 1)

The POE has a narrower scope, evaluating the building's operational performance against the set energy and efficiency targets and focusing on building users' satisfaction and perceived comfort (Agha-Hossein, Birchall and Vatal, 2015). In short, a POE "is the process of understanding how well a building meets the needs of clients and building occupants" (RIBA *et al.*, 2017: 6).

A POE is a rigorous systematic process guided by human needs, building performance and facility management, evaluating the technological and anthropological elements of a building in use. They can be explored in many disciplines, from architecture to psychology and sociology. The outcomes dictated by the research drivers and findings vary from environmental or technical reports to socio-psychological factors (Hadjri and Crozier, 2009). The Preiser, White and Rabinowitz (2015) book on POE was one of the first and most comprehensive guides to building evaluation. They developed a process model documenting POE's various levels and systematic processes. The three levels depend on the availability of time, resources and the desired outcomes: indicative, investigative, and diagnostic.

Indicative POEs usually provide a brief overview of the building's performance to report significant strengths and weaknesses. They are typically carried out by those familiar with the building and have experience conducting POEs. They can be evaluated through existing documents such as floor plans or project data, generic survey questions completed by the organisation, short interviews, and a facility walkthrough with photographic documentation. Given the nature and scope, they can be completed in a relatively short period of 2-3 hours or 1-2 days (Preiser, White and Rabinowitz, 2015).

Investigative POEs are more in-depth, looking into building performance, including building users, in order to identify significant problems. As a result, those conducting the POE require more time and resources. In addition to utilising more advanced data collection and analysis techniques than operating at just the indicative level, it involves more time on site. For example, it can include a literature review of similar

facilities, guidelines, and performance standards. These typically require 160 to 240 hours of work from the team and additional hours from the organisation (Preiser, White and Rabinowitz, 2015).

Diagnostic POEs are focused, longitudinal, and cross-sectional building evaluations and large-scale projects. They require a lot more academic rigour and discipline. As such, the methodology can mirror that of traditional scientific paradigms. They comprise multiple methods to determine relationships among variables, including questionnaires, surveys, observations, and physical measurements. The scale of these studies means they can take months, if not years, to complete. Nevertheless, results can identify the building as a champion of its typology, which can inform future facilities (Preiser, White and Rabinowitz, 2015; Preiser and Schramm, 1997). This study uses an experimental Diagnostic POE, utilising multiple methods to create a holistic image of the environment.

4.3.1 POEs Place in Architectural Practice

"The Architect and His Office", published by RIBA (1962) led to the development of POE within UK architectural practice (Cooper, 2001). They suggested practices should "gather and disseminate information and experience on user requirements [... and] greater attention should be paid by practising architects and schools of architecture to the application of work-study techniques to problems of this kind" (RIBA, 1962: 15). They concluded that the study of buildings in use, from technical cost and design perspectives, should have greater importance within architectural practices (RIBA, 1962: 187). It was subsequently introduced into the Plan Of Work (POW)[5] in 1965 by the RIBA as a Final Work Stage (M: Feedback). Proposing the building should be inspected three years after completion as a cost-effective measure of service improvement for future projects. However, by 1973 RIBA had omitted this stage from subsequent editions due to its failure to be financially viable for the profession (Bordass *et al.*, 2004; Cooper, 2001; Stevenson, 2019). This was followed

[5] the guide produced for the architectural profession operating within the UK

by a slow decline of social science subjects in architectural education. By the early 1990s, POE and environmental psychology had entirely disappeared from the curriculum of British architecture schools (Pol, 1993: 39). The Bologna Declaration of the late 90s situates architecture education as an all but monodisciplinary subject (Mendes and Sá, 2017). This exclusion was reconsidered in 1999 by the RIBA, stating that POE and a systemising feedback system could improve customer focus. In 2003, the RIBA practice committee agreed to reintroduce stage m to incorporate such feedback throughout the project lifecycle with the plans clearly defined, programmed and costed (Bordass *et al.*, 2004). This aim was successfully achieved in 2013 with the reinstated POE within "stage 7: in use" of the RIBA plan of work, along with the broader BPE feedback loop integrated from procurement (Fletcher and Satchwell, 2015; Sinclair, 2013; Stevenson, 2019). This stage "acknowledges the potential benefits of harnessing the project design information to assist with the successful operation and use of a building" (Sinclair, 2013: 27). It encouraged "more rigorous data collection and analysis on a diverse range of issues", including technical performance and how people feel and respond to the created environment (Fletcher and Satchwell, 2015: pxvii) and aligned with an attempt to reintroduce POE and BPE into architectural education. A resolution was made in the 2015 conference by the Standing Conference of Schools of Architecture (SCHOSA) to embed the practices within the education system (RIBA *et al.*, 2017). Some UK architecture schools are already collaborating with practices to conduct POE of live buildings. This POE module would provide "a platform for collaboration between academia, practice and policymaking to foster evidence-based sustainable building design and performance" (Gupta, 2014: 148).

Research in architecture is not typically viewed as a "separate service" but intrinsically tied to everyday practices (RIBA, 2014). Architects value feedback through surveys, visits, or informal discussions with building users. Most of this experience is shared internally to guide other projects. However, dissemination of findings could benefit the wider industry and deliver "better buildings together" (RIBA, 2014: 26). "[P]ost-occupancy evaluations are not a priority for the practice; there is a lack of standardised guidelines which would make this type of research

more applicable for a wider audience (and therefore hold more value)" (Pierre Maré as cited in RIBA, 2014: 19). In 2017, of RIBA chartered practices, only 14% offered research services, and 10% offered POE services (The Fees Bureau, 2018). However, Sharpe (2018a: 321) states that "[i]f architectural design is to evolve, the development of knowledge, through evidence-based design, is a critical factor". RIBA *et al.* (2017) advise that although the POE is written into the Plan of Work (POW), it should be a creative, collaborative effort between all project team members, clients, and other appropriate built environment professionals. RIBA *et al.* (2017: 1) suggests that a business benefit of a strategically developed POE is that it can "develop and evidence their company ethos and brand" and set them apart as an influential "leader in the field".

There seems to be a willingness to adopt research and building evaluations within RIBA practices (RIBA, 2014; RIBA *et al.*, 2017); however, Architects feel there is a lack of standardisation and systematic research processes to effectively address the performance gap between the building's capabilities and its realisation. "[P]art of the struggle is to be able to translate academic research into something meaningful and useful for architects. Current systems are not well suited to help academics disseminate their work amongst practices, nor are practices generally in a position to receive academic insights" (RIBA, 2014: 26). Other barriers to BPE are the threat of liability, indemnity, damage to reputation or lack of rigorous research skills (RIBA *et al.*, 2017; Sharpe, 2018a; Stichler and Hamilton, 2008). Barriers to POE "include the question of cost and who pays for POE, the fear of exposing problems with a design, impacts on reputation, and the need for the development of POE education and know-how within practice" (RIBA *et al.*, 2017). It was found that no revenue was generated from POE for the 10% of practices offering that service (The Fees Bureau, 2018). Organisations are often unlikely to pay for POE services unless they have obvious and substantial project values (Cooper, 2001). Often clients are not willing to pay for POE services, particularly those that involve social science methods but ponder that if the services can directly correlate with a reduction in energy bills, would they be more willing to invest? (RIBA, 2014). Hamilton (2003) also highlights that even with the benefits of research or POE, the architect is unlikely to

spend time on these unfunded efforts if the client is unwilling to pay for such services. However, it is acknowledged that designers frequently employ research findings to improve the design. The added element of rigour to these efforts could shift these findings into the realm of evidence-based practice. The architect should make the client aware of the benefits of an evaluation (Hamilton, 2003).

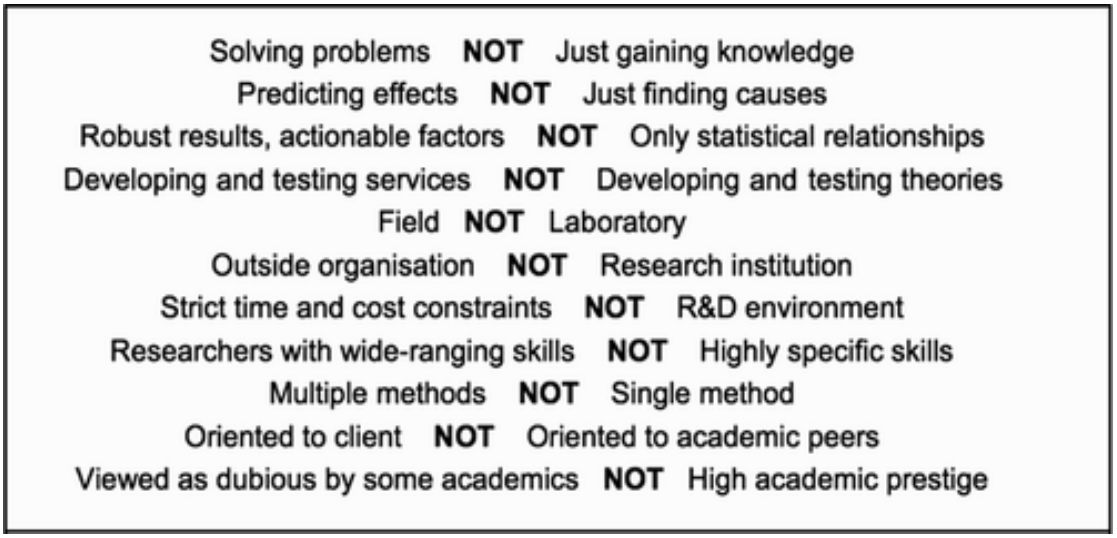
There are many outcomes POEs measure, from more tangible environmental, economic and sustainability measures to harder to quantify measures such as cultural identity, atmosphere and belonging (RIBA *et al.*, 2017). Friedmann, Zimring and Zube (1978: 9) take an anthropological view on POE, stating that "[t]he ultimate test of the success of the designed setting is its ability to satisfy and support explicit and implicit human needs and values". The importance of people in an environment is becoming more prominent within building evaluation studies. POE can measure the effectiveness of the project outcomes established in stages 0 and 1. They should not only focus on building systems, but importance should be given to the building users' activity and wellbeing (Fletcher and Satchwell, 2015). There are a growing number of methodologies, processes, tools, and techniques to achieve these building evaluations, with it becoming a specialised area of expertise where consultants offer bespoke BPE and POE services (Fletcher and Satchwell, 2015). Some of the standard research methods are:

- Focus groups that can explore the experience of building users;
- Monitoring of organisational activities that identify the functionality of the building in use;
- Visual or sensor observations, which can identify and track patterns of use;
- Identifying project success and failures that can be tracked to inform future projects and highlight issues to resolve;
- Identifying unintended use of spaces to feedforward into similar projects.

(Fletcher and Satchwell, 2015)

RIBA *et al.* (2017) report that practices are developing innovative and collaborative approaches to POE. Hamilton (2003) states that the best building evaluation findings are achieved through an unbiased independent third-party evaluation. Many

Figure 4-1 Building-performance studies are an example of real-world research. Source: adapted from (Robson & McCartan, 2016, p. 12).



proactively seek researchers to allow the POE process to be guided by academic rigour and expertise. Walkthroughs and focus groups are simple methods for evaluating the user experience of buildings in use. Qualitative approaches help document detailed perspectives of the real-life impacts of the project or building. More interactive workshops with clients and users, such as mapping and photography, can encourage engagement in POE activities (RIBA *et al.*, 2017).

4.3.2 Achieving a Comprehensive Building Evaluation

Design briefs should detail the envisioned performance of the building when complete. These can be broadly evaluated in three elements: suitability for occupants' needs, environmental performance, and economic value, such as return on investment. If they have performed poorly, the results are likely to be unpublished. After that, the same mistakes may be repeated. Building performance studies can be perceived as documenting underachievement. This is not due to the researcher's pessimistic perspective but to findings based on reality. However, exceptions and, subsequently, good examples are often unreported due to not being routinely monitored: “the pursuit of quantification [can obscure] qualification” (Leaman, 2010b: 565). Therefore, when conducting building evaluations, consideration should be given to context and circumstances, design quality and perceived value (Leaman,

2010b).

Building evaluations are real-world research and, as such, should be orientated towards real-world implications and impact. Leaman (2010b) suggest eleven criteria for achieving "real-world research", as seen in Figure 4-1 and Table 4-2. This table describes each criterion and how this thesis achieves these.

Table 4-2 Building-performance studies are an example of real-world research. Source: adapted from (Robson and McCartan, 2016: 12).

Eleven criteria for achieving "real-world research"	**Applicability to this research**
Solving problems Building evaluation should monitor performance to discover and resolve issues within the current building or form knowledge to improve future facilities (Leaman, 2010b).	The primary aim of this research was to provide lessons learned for future projects through monitoring of perceptions and environmental performance. This was evidenced in the research objectives of Chapter 1 and the findings and conclusions of Chapters 8-11.
Predicting effects Predicting possible effects helps understand complex processes and consequences. However, some emergent elements can be unexpected	The literature reviews in Chapters 2-4 help predict potential outcomes – guiding the research methods and providing resolutions for unexpected issues that arise.
Robust results Evaluation methods should achieve an element of scientific rigour and produce repeatable, believable, and convincing results. However, the procedures should not take importance above the real-world character of the building	There was a balance between research methods which provide academic rigour, such as the quantitative methods of the surveys and monitoring and the qualitative methods of interviews and observation, which capture the character of the organisation and people's lived experiences—explored in Chapters 8 and 9.
Developing services Consideration should be given to who is conducting the study and why. Ensuring there is no bias but a genuine attempt to improve performance	As a PhD study, it involved an unbiased academic perspective with a genuine interest in determining what works and what does not. Although the organisation partially funded this study, the research had no limitations on publications.

Field, not laboratory Outcomes of evaluation studies should ensure the occupants are satisfied problems will be addressed and an attempt made to resolve	The researchers spent a substantial amount of time at the organisation site, understanding the organisation and people and getting an understanding of the space and how it can be evaluated to produce valuable outcomes, as seen in Chapter 8
Outside organisation Gaining access can be the hardest part of the study. The researcher requires cooperating and establishing relationships with the organisation.	The organisation had pre-existing connections with the university along with the project architect. Making it easier to form trusting relationships, with the ability to effectively communicate between architectural and clinical language. The organisation assigned an industry supervisor who helped establish the BRMG to discuss progress. Evidence of this is seen in Chapters 5 and 6.
Time/cost constraints Reducing time in the building ensures the organisation's daily activities are not interrupted or hindered. However, going back to do further observation, discussions, and measurements can help resolve issues uncovered in initial observations	Time and cost constraints were not fully applicable because it was a funded PhD study. This meant the researcher could spend as much time as required in the environment, thus allowing the researcher to conduct interviews with a wide variety of staff patients' families and friends. Evidence of this is seen in Chapters 7 and 8.
Researcher with wide-ranging skills The nature of building evaluation is multidisciplinary. Therefore, researchers should draw on a range of disciplines. Effective teams can be made up of those with design, environmental and human-focused perspectives. However, this balance is rarely achieved. Researchers should have good statistical knowledge and effective communication skills	The researcher spent time exploring fields beyond architecture, which are documented throughout the thesis but most prominent in the conceptual framework and methodology of Chapters 4 and 5. Wide-ranging research methods were also applied to the study to ensure a holistic evaluation of the environment, as seen in Chapter 7.
Multiple methods Utilising multiple methods, such as the PROBE approach to building evaluation, is helpful. Use should be made of existing tried and tested evaluation techniques, which can come with the added benefit of empirical benchmarks from previous studies	This Chapter was based on gathering research from building evaluation studies and their tools – to create a Framework for this project. A Pilot Study was conducted within the previous facility to be used as a benchmarking tool, but this was not achieved due to low sample sizes and differing methods.

Orientated to client Many studies might utilise jargon or specialised language and be difficult to understand or, conversely, over-simplistic, leading to misleading results. Therefore, everything should be included within the report but be purposely worded and not overly long. This might be achieved through sub-reports, allowing the client to decide what reports they wish to share	It was important for the researcher to communicate and disseminate the research to the organisation and those who use the services. This was achieved through small interim reports provided to the organisation in addition to conducting presentations
Dubious to academics Some academics regard case studies as purely anecdotal as they utilise mixed methods or focus on multiple aspects – reducing the reliability. However, an in-depth and detailed case study can help understand and explain lessons learned and inform future decision-making	As this research was deeply rooted within the case under study, it was essential to provide a picture of the entire environment with the Hospice organisation especially keen to see participation from those who used the services. The main findings formed from interview data through thematic analysis supplemented through environmental monitoring. Evidence can be seen in Chapters 8-9 and can be used to inform future decisions.

4.3.3 Methodologies for Building Evaluations

There are a variety of pre-existing methodologies used throughout various stages of a building project to both evaluate and certify. One, influential within the UK for re-ignited interest in POE was funded by the UK government: the Post-occupancy Review Of Buildings and their Engineering (PROBE) series of studies published in Building Services Journal (BSJ) from 1995 to 2002. These studies were generally regarded as the first attempts in the UK to systematically document the performance of new non-domestic buildings (Chiu, 2014) and were the first UK POEs published in a journal, setting a precedent for future projects (Bateson, 2015; Cooper, 2001; Derbyshire, 2010; Hadjri and Crozier, 2009; Stevenson, 2019). PROBE acknowledged that "[i]n use, buildings do not always work as intended. Some features perform better, some worse, some differently" (Cohen *et al.*, 2010: 85). They highlighted that sharing feedback from buildings could be done to a high standard of scientific rigour and widely disseminated "without attracting litigation or technical disputation" (Derbyshire, 2010: 82).

To ensure scientific rigour and credibility, standardised methods were employed by adaption of existing methodology and benchmarking tools. The two established tools that formed the foundation of PROBE were the Building Use Studies (BUS) methodology and the Occupant Survey, a prototype of the Energy Assessment and Reporting Method's (EARMTM) Office Assessment Method (OAM). An additional Pre-Visit Questionnaire (PVQ) was developed to collect "desktop" style information about the building to provide an informed initial building visit. The BUS methodology was initially developed in 1985 and licensed in 1995 (Leaman, 2010a). The publication of PROBE studies and the use of the BUS survey have led to standardisation within UK POEs and are still in use today (Chiu, 2014). In 2015, BSRIA endorsed the BUS methodology occupancy survey (Agha-Hossein, Birchall and Vatal, 2015), showing its viability, even after 35 years. The building evaluation criteria related to the design meeting it's perceived needs, personal control over environmental elements, system responsiveness; covering areas such as temperature, indoor air quality, lighting, noise, comfort, health and productivity (Cohen *et al.*, 2010).

Soft Landings was a concept conceived in the late 1990s in response to the findings from PROBE studies, which indicated that buildings often failed to meet client expectations and design team ambitions. The Soft Landings is an initiative by BSRIA, incorporated from stage 2 of the RIBA Plan of Work (POW), aiming to improve the building transition from construction to occupancy, optimising operations and performance (Bateson, 2015). It focuses on BPE of internal environmental quality and energy, with Stage 7 in the POW providing an opportunity for more integration into practice and allowing findings to "feedforward" into future projects. This can also benefit clients, providing insight and knowledge about the performance of their buildings and how best to operate them (Fletcher and Satchwell, 2015). The UK government recently adopted these Soft Landings principles for its procurement strategy, termed Government Soft Landings (GSL). It adds an extra layer to the process, identifying targets in RIBA Stages 0 and 1, allowing for further review at stage two. At a minimum, GSL requires the following elements to be reviewed: "functionality, environmental performance, FM operations, training,

commissioning and handover" (Bateson, 2015: 4). In 2016, there was a mandate on all centrally funded projects to incorporate the principles of GSL within Building Information Modelling (BIM) level 2, highlighting the value and recognition the UK government is placing on the mainstream integration of POE within construction projects (Bateson, 2015; RIBA *et al.*, 2017).

There are now a variety of building certifications, predominantly related to a buildings environmental aspect but more recently focusing on user wellbeing. Two well-known green building tools are Leadership in Energy and Environmental Design (LEED), mainly used in the USA, and British Research Establishment Environment Assessment Methodology (BREEAM), utilised in the UK. Recently, a toolkit focusing on human health and wellness has been introduced: "the WELL building standard is the world's first building standard to focus on enhancing people's health and wellbeing through the built environment" (Matos, 2014: para 1). The toolkit was launched in 2014 by The International WELL Building Institute (IWBI) (Matos, 2014), with an updated version being introduced in 2020 (IWBI, 2020) after its pilot launch in 2018, which tested over 3,300 projects across 54 countries (Fedrizzi and Hodgdon, 2020; Matos, 2014). The WELL toolkit includes "strategies that aim to advance health by setting performance standards for design interventions, operational protocols and policies and a commitment to fostering a culture of health and wellness" (IWBI, 2020). A report by the IWBI (2019) detailed the top modifiable risk factors contributing to Disability-Adjusted Life Years (DALYs) within the UK and how the WELL toolkit can be applied to address these. The most prevalent DALYS within the UK relates to drug or alcohol abuse, lack of balanced nutrition and occupational risks (IWBI, 2019), figures shown in Table 4-3. The WELL toolkit focuses on evaluating behavioural and environmental risk factors within buildings. It suggests that many DALYs can be addressed by improving wellbeing and empowering people rather than just treating disease. Something addressed within The WELL Framework of 108 wellbeing features ten concepts: air, water, nourishment, light, movement, thermal comfort, sounds, materials, mind, and community (IWBI, 2021).

Table 4-3 Top modifiable risk factors that contribute to Disability-Adjusted Life Years (DALYs) within the UK (Figures from IWBI (2019))

The top 10 UK MPFs	DALYs per 100,000people	Total of DALYs (all causes)
smoking	2994	11.36%
Alcohol use	1263	4.79%
Low whole grains	670	2.54%
Drug use	640	2.43%
Low fruit	260	2.12%
Ambient particulate matter	537	2.04%
Occupational asbestos	413	1.57%
Low physical activity	352	1.34%
Low vegetables	338	1.28%
Occupational ergonomic factors	259	0.98%

4.4 Scoping Review of Post-Occupancy Evaluation in Healthcare

A scoping review on the use of POE in healthcare was conducted with the research question “What post-occupancy evaluation techniques can be used in healthcare environments?”. The aim was to comprehensively gather evidence on existing POE articles and tools which have or can be used in healthcare. The protocol was registered on the 2 March 2024 which provides detail on the background and scope of the review (Kinloch and Grant, 2024). The outcomes support the creation of a novel post-occupancy evaluation (POE) tool for evaluating the PPWH environment.

4.4.1 POE in Healthcare

There are several challenges to undertaking a POE in a healthcare environment. The first issue is that new healthcare facilities can take three to nine years to materialise. This time gap could impact the measurement and reporting of outcomes,

organisations forgetting what they intended to measure, and staff involved in initial project may have left. An additional challenge is that the organisations have to transition and adapt to an unfamiliar environment and often a new way of working, which can hamper efficiency and increase stress levels. This can lead to the organisation becoming “less interested, disenchanted with, or do not see the need for measured outcomes”: Particularly if the feedback may be clouded by a difficult transition period (McCullough, 2010: 4).

Performance measures within healthcare projects often directly relate to the performance of health outcomes, making POE a more complex process (Codinhoto *et al.*, 2009; Stichler, 2007). Alvaro *et al.* (2016) highlighted that typically, POE outcomes are determined by government or hospital “scorecards”, which are often challenging to directly relate to the design and, therefore, can fail to capture the experience of the building users adequately. Their study evaluated a new hospital, the former facilities, and a comparison facility. The new hospital was designed specifically for the needs of patients, with attention given to connection to communities, nature, and the city, which aims to enhance social connectedness and stimulate activity. Therefore, they suggest an alternative Hospice POE Toolkit, where the buildings' design intentions form the theoretical foundations for developing and evaluating outcomes. Rather than focus on traditional objective health outcomes, it focuses on the design's impact on psychosocial wellbeing (Alvaro *et al.*, 2016). This view was echoed by Day (2007: 88), who criticises the traditional use of empirical evidence, doubting healing environments can be measured through “pain scores, mixed-venous oxygen saturation, or hospital length of stay”. This study addresses this “traditional” style of evidence by developing a Hospice POE Toolkit based around aspects of wellbeing to evaluate person-centred aspects of the new facility.

Commonly used evidence-based tools evaluating healthcare design quality within the UK are Achieving Excellence Design Evaluation Toolkit (AEDET) and A Staff and Patient Environment Calibration Tool (ASPECT). Although launched in 1994, AEDET was published in 2001 to establish an industry-wide toolkit for healthcare

design evaluation (Phiri, 2015). The AEDET offers 59 points against which the design is evaluated {Facilities, 2008 #4360}. Built upon the foundations of the DQI[6], the AEDET provides a comprehensive assessment of buildings, covering three main sections: impact, build quality and functionality, divided into ten assessment criteria. In 2004, the University of Sheffield healthcare research group refined the toolkit, renamed AEDET Evolution, in response to criticisms regarding the source of authority, ease of use and reliability. ASPECT was developed as an extension to AEDET Evolution, related to measuring the building concerning patient and staff satisfaction and patient health outcomes. A DQI specific to health buildings was finally launched in 2014, offering an alternative to AEDET Evolution and adopted by some organisations, such as NHS England (Phiri, 2015; Phiri and Chen, 2014).

4.4.2 Scoping Review Methods

The search was conducted in eight electronic databases (CINAHL, Engineering Village, Embase, Medline, Greenfile, PsycINFO, Scopus and Web of Science). Further searches included databases for standards and technical reports (Barbour Index. Center for Health Design (CHD), and construction information services (CIS)), and grey literature sources (World Health Organisation (WHO), Google, Google Scholar, ProQuest Dissertations and Theses Global, Environmental Design Research Association (EDRA) and International Association People-Environment Studies (IAPS) conference proceedings). EDRA conferences proceedings available on their website from 1969 to 2023 where reviewed – the only exclusions were workshops, plenary sessions, and posters: due to the lack of written paper associated with these types of output. Unfortunately, there was no access to IAPS through their website or contact with the organisation and therefore the inclusion of IPAS results was limited to other search methods.

A first screening (reading the title and abstract) of all the articles and a second

[6] The Design Quality Indicator (DQI) evaluates the design quality and construction of many new and refurbished buildings throughout all project stages. Launched in 1999 and managed by the UK's Construction Industry Council (Phiri and Chen, 2014).

screening (assessing the full text of eligible articles) was conducted. The outcome and process of which is seen in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Diagram {Moher, 2010 #4739} in Figure 4-2. The inclusion and exclusion criteria are provided in Table 4-4. The synthesis is predominantly in tabular format, with additional description where required.

Figure 4-2 PRISMA Diagram {Moher, 2010 #4739}

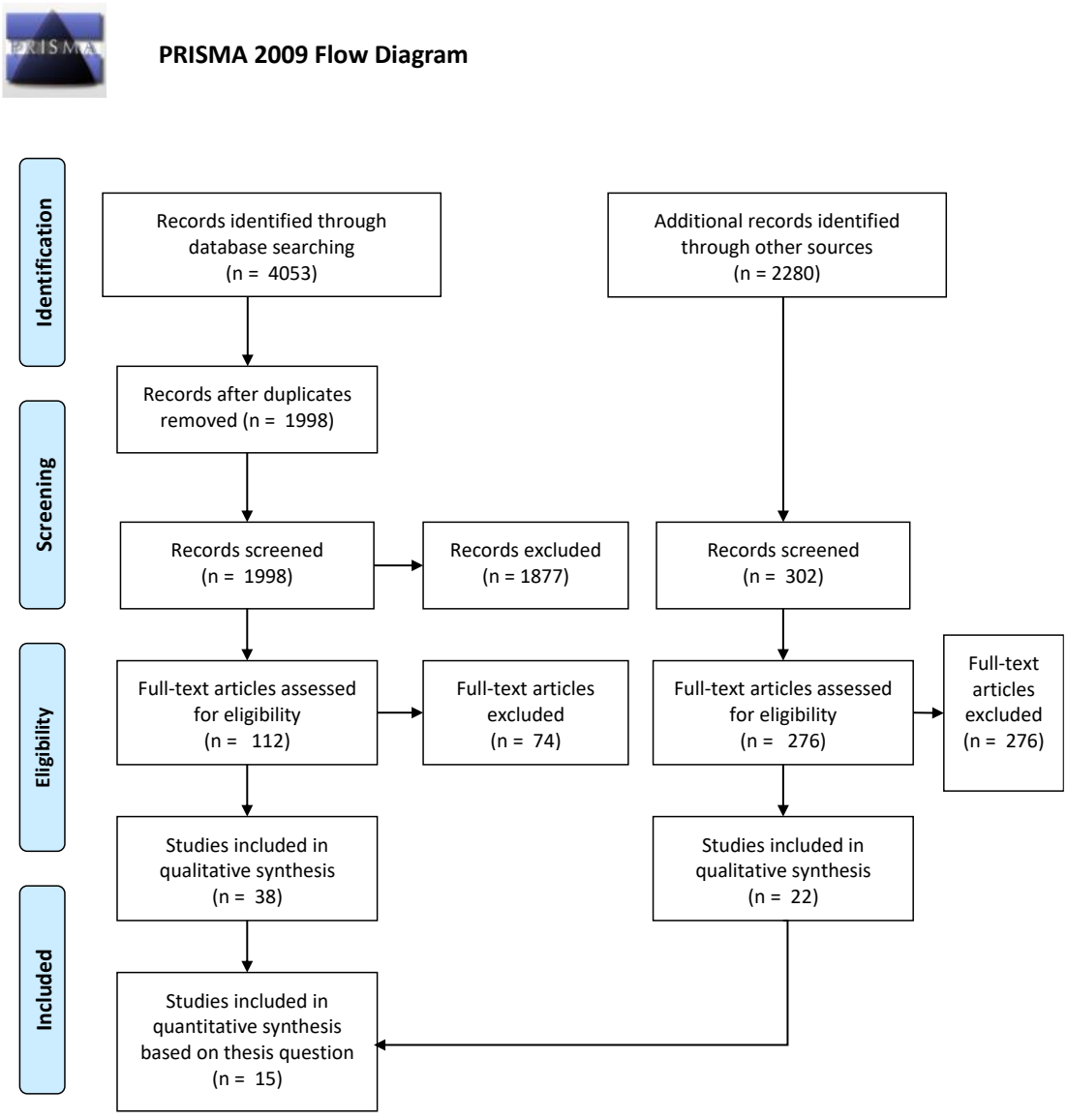


Table 4-4 Scoping Review: Inclusion and Exclusion Criteria

Inclusion criteria	Exclusion criteria

all post-occupancy evaluation (POE) techniques described as suitable or have been used for healthcare settings. articles where the POE technique can be applied to any setting. peer-reviewed journal articles, conference papers, books. Expert opinion and grey literature such as case studies, thesis' and industry reports/ publications. all date ranges. articles from any country.	Emergency department or outpatients post-occupancy evaluation techniques that focus on specific building typologies that are not healthcare settings (for example schools, universities, residential and so on) or cannot generally apply to healthcare settings. articles that are not evaluating the buildings after users occupation (i.e. exclude those that are evaluated pre-hand-over). articles that involve a scale beyond buildings (such as neighbourhoods). articles that do not describe the techniques or research methods used in the POE. literature reviews including narrative, systematic reviews and meta-analyses. techniques that do not investigate all occupant feedback (must include both staff and patients/ families). articles not in English.

4.4.3 Scoping Review Results

There was a final of 71 articles that answered the question "What post-occupancy evaluation techniques can be used in healthcare environments?", with the reference, title, year, type, setting and reason for inclusion or exclusion provided in Table 4-5.

Out of the 71 articles, 18 were relevant to the research questions for this study: "What methodologies are applicable to the measurement of the person-centred outcomes of a hospice environment focusing on wellbeing, and how can these be critiqued for their effectiveness?". However there were directly similarities in three sets of articles, for analysis purposes these were considered as one article – therefore a total of 15 articles were evaluated. Table 4-6 contains the reference, title, type of article and setting and key focus area. Analysis of and comparison of these articles including salient and discriminating features can be found in Chapter 9.

The included articles are nine articles focusing on a specific building (or series of buildings), three tools (developed to inform the POE), and three containing both

tools and related articles. 13 articles focused specifically on a healthcare environment with cancer centres (N=3) and hospitals (N=3) being the main category followed closely by hospices (N=2): the other two included articles focused on general buildings. The articles were published between the years of 2007-2023 with many being published in 2016 (N=3) and 2022 (N=3); so they are applicable to current advancements in healthcare. The articles cover an international scope with N=6 published in the USA, N=3 in the UK, N=2 in Canada, N=1 in Malaysia, N=1 in Iraq, N=1 in Italy and N=1 in Cyprus.

Table 4-5 71 articles that answered the question "What post-occupancy evaluation techniques can be used in healthcare environments?" and their reasons for inclusion or exclusion.

Title and Reference	Year, Type, Setting	Include	Reason
Post occupancy Evaluation of a Neighbourhood Concept Redesign of an Acute Care Nursing Unit in a Planetree Hospital (Rose *et al.*, 2022)	2022, Study: Hospitals	Y	Focuses on a neighbourhood model akin to the Sengetun care model, rooted in the Planetree Philosophy and centred on wellbeing.
The Continuous Learning Cycle: A Multi-phase Post-occupancy Evaluation (POE) of Decentralized Nursing Unit Design (Cai and Spreckelmeyer, 2022)	2022, Study: Hospitals	Y	Focuses on a decentralised model, using a longitudinal approach and involving key stakeholders in the research design.
Environmental Physical and Perceived Quality in Hospice (Ferrante and Villani, 2021)	2021, Study: Hospices	Y	Focuses on the physically and emotionally supportive aspects of hospice settings and their impact on person-centred care and wellbeing.
The Role of Patients' Psychological Comfort in Optimizing Indoor Healing Environments: A Case Study of the Indoor Environments of Recently Built Hospitals in Sulaimani City, Kurdistan, Iraq (Mahmood and Tayib, 2020)	2020, Study: Hospitals	Y	Focuses on psychological comfort and environmental quality in broader settings, applicable to assessing person-centred outcomes, including cultural aspects.
Healing environment			

correlated with patients' psychological comfort: Post-occupancy evaluation of general hospitals (Mahmood and Tayib, 2019)			
Perceived Importance of Wellness Features at a Cancer Center: Patient and Staff Perspectives (Tinner, Crovella and Rosenbaum, 2018) Perceived importance of wellness features at the Upstate Cancer Center: Patient and staff perspectives (Tinner, 2016)	2018, Study: Cancer centres	Y	Focuses on wellness features related to person-centeredness
Evaluating Intention and Effect: The Impact of Healthcare Facility Design on Patient and Staff Well-Being (Alvaro *et al.*, 2016)	2016, Study: Healthcare	Y	Focuses on evaluating design effectiveness based on wellbeing outcomes.
Evidence-based design in an intensive care unit: End-user perceptions (Ferri *et al.*, 2015)	2015, Study: Specific: ICU	Y	Focuses on designs conducted in ICUs using EBD principles centred on wellbeing, noting similarities in patient populations with hospice settings.
Development of Hospice Environmental Assessment Protocol (HEAP): A post occupancy evaluation tool (Kader, 2017)	2017, Tool: Hospices	Y	Focuses on a direct relationship to hospice settings; uses tools not specifically for capturing feedback but tailored to hospice 'therapeutic goals' and adaptable for Post-Occupancy Evaluation (POE) methods.
The Inclusion, Diversity, Equity and Accessibility audit. A post-occupancy evaluation method to help design the buildings of tomorrow (Zallio and Clarkson, 2022)	2022, Tool: General buildings	Y	Focuses on broader methodologies (general buildings) that are applicable to hospice settings due to their inclusivity and accessibility.
Ambulatory infusion suite: pre- and post-occupancy evaluation (Shepley *et al.*, 2012)	2012, Study: Cancer centres	Y	Focuses on environmental psychology and wellbeing principles such as choice, control, and biophilia, despite different

			settings.
Assessment of Healing Environment in Paediatric Wards (Ghazali, 2010) Healing Environment: Status and Design Trend of Pediatric Wards (Abbas, 2009)	2010, Study: Paediatric wards	Y	Focuses on paediatric settings with outcomes related to healing environments that directly correlate to wellbeing.
Establishing psychological wellbeing metrics for the built environment (Watson, 2018)	2018, Tool: General buildings	Y	Focuses on utilising methods to measure enhancements in psychological wellbeing.
Exploring the Use of the AEDET Hospital Evaluation Toolkit to Create a Better Healing Environment for Cancer Patients beyond the Global North (Tekbiyik Tekin and Dincyurek, 2023)	2023, Both: Oncology hospitals	Y	Focuses on cancer care, with insights from adapting and applying the AEDET toolkit applicable to the UK setting, emphasising wellbeing principles and healing environments.
Does the design of hospitals meet the needs of older people? An evaluation of three acute-care settings (Barnes, Torrington and Lindquist, 2016)	2016, Both: Specific: Acute-Care Units	Y	Focuses on insights from studies designed for older adults' specific needs, applicable to hospice settings and person-centred aspects.
A post occupancy evaluation of the Dundee Maggie Centre (Stevenson and Humphris, 2007)	2007, Both: Cancer centres	Y	Focuses on a cancer-care centre, assessing psycho-social support and wellbeing in relation to the hospice setting.
The Impact of Infusion Center Layout on Workflow and Satisfactions in Two Cancer Infusion Centers: A Case Study on Staff and Patients (Jalalianhosseini *et al.*, 2020)	2020, Study: Cancer centres	N	Lacks sufficient patient feedback.
A field study on indoor environment quality of Chinese inpatient buildings in a hot and humid region (Tang *et al.*, 2019)	2019, Study: Hospitals	N	Lacks sufficient feedback.

Overcoming the Challenges Inherent in Conducting Design Research in Mental Health Settings: Lessons from St. Joseph's Healthcare, Hamilton's Pre and Post-Occupancy Evaluation	2016, Study: Mental Health Facility	N	Not transferable to hospice setting.
Evaluation of the built environment: staff and family satisfaction pre- and post-occupancy of the Children's Hospital (Ahern *et al.*, 2016)	2011, Study: Paediatric hospital	N	Not transferable to hospice setting.
Evaluation of the built environment at a children's convalescent hospital: development of the Pediatric Quality of Life Inventory parent and staff satisfaction measures for pediatric health care facilities (Varni *et al.*, 2004)	2004, Study: Paediatric hospital	N	Not transferable to hospice setting.
Post-occupancy evaluation and field studies of thermal comfort (Nicol and Roaf, 2005)	2005, Study: General buildings	N	Lacks sufficient user feedback.
A post-occupancy evaluation of wayfinding in a pediatric hospital: Research findings and implications for instruction (Brown, 1997)	1997, Study: Paediatric hospital	N	Not transferable to hospice setting.
Post-occupancy evaluation and codesign in mental healthcare buildings: User's input as a driver for functional and technical adaptations in post COVID-19 reality (Goulart and Ono, 2022)	2022, Both: Mental Health Facility	N	Not transferable to hospice setting or applicable to study purpose
Applying Social Return on Investment (SROI) to the built environment (Watson	2017, Tool: Cancer centres	N	Not applicable to person-centredness.

and Whitley, 2016)			
BOSSA: a multidimensional post-occupancy evaluation tool (Candido *et al.*, 2015)	2016, Tool: Office buildings	N	Not transferable to hospice setting or study purpose
Capturing the social value of buildings: The promise of Social Return on Investment (SROI) (Watson *et al.*, 2016)	2016, Both: Cancer centres	N	Not transferable to hospice setting or study purpose.
A systematic conduct of POE for polyclinic facilities in Saudi Arabia (Salaheldin, Hassanain and Ibrahim, 2020)	2021, Study: Outpatients	N	Not transferable to hospice setting or study purpose.
Post-occupancy evaluation of indoor environmental quality in ten nonresidential buildings in Chongqing, China (Tang, Ding and Singer, 2020)	2020, Study: General buildings	N	Not transferable to hospice setting or study purpose.
Newly Built Public Paediatric Wards Increase Length of Stay (LOS)? (Ghazali, 2012)	2012, Study: Paediatric wards	N	Not transferable to hospice setting or applicable to study purpose.
Investigation on the Indoor Environment Quality of health care facilities in China (Liu *et al.*, 2018)	2018, Study: Hospitals	N	Not transferable to hospice setting or applicable to study purpose.
Analysis and Evaluation of Indoor Environment, Occupant Satisfaction, and Energy Consumption in General Hospital in China (Sun *et al.*, 2023)	2023, Study: Hospitals	N	Not transferable to hospice setting or applicable to study purpose.
Performance assessment of the built environment in healthcare facilities (Salaheldin *et al.*, 2021)	2021, Study: Outpatients	N	Not transferable to hospice setting.
Building a knowledge base for evidence-based healthcare facility design through a post-occupancy	2014, Study: Hospitals	N	Not applicable to person-centredness.

evaluation toolkit (Joseph *et al.*, 2014)			
Lessons learned from 20 years of CBE's occupant surveys (Graham, parkinson and schiavon, 2021)	2021, Study: Care home	N	Not transferable to hospice setting.
A structural format to facilitate user input for the co-design of a cardiac health unit (Waroonkun, 2020)	2020, Study: Specific: Cardiac Health Unit (CHU)	N	Not transferable to hospice setting.
Performance evaluation of a psychiatric facility in São Paulo, Brasil (Walbe Ornstein *et al.*, 2009)	2009, Study: Mental Health Facility	N	Not transferable to hospice setting.
Post-occupancy evaluation correlated with building occupants' satisfaction: An approach to performance evaluation of government and public buildings (Nawawi and Khalil, 2008)	2008, Study: Government and public buildings	N	Not transferable to hospice setting or applicable to study purpose.
Clinic Design Post-Occupancy Evaluation Toolkit (PDF version) (Design, 2015)	2015, Tool: Outpatients	N	Not transferable to hospice setting.
A post-occupancy evaluation of patient's perception of visual comfort in hospital wards (Pritam and Mukta, 2012)	2012, Study: Hospitals	N	Not transferable to hospice setting.
Design enhancing instruments: Post Occupancy Evaluation in Hospice Design (Ferrante, 2013)	2013, Study: Hospices	N	Lacks sufficient: evidence
Improvement of visual comfort through a human-centered methodology. An experience of Post Occupancy Evaluation in hospital buildings (Spirito	2019, Study: Specific: Clinic waiting rooms	N	Not transferable to hospice setting.

and Giuliani, 2019)			
Post-Occupancy Evaluation of Fountain House: A Study on an Alternative Healthcare Facility (Erfani, 2017)	2017, Study: Outpatient: mental health	N	Not transferable to hospice setting.
Harmonizing Health Services by Design at Providence Care Hospital: User Experience and Design Evaluation Before and After the Redevelopment (Celeste Alvaro, Melanie Elliott and Kostovski., 2019)	2019, Study: Hospitals	N	Not transferable to hospice setting.
Post-Occupancy Evaluation: Observations on Patient Satisfaction and Staff Operations (Meilink and Debbie Phillips, 2016)	2016, Study: Hospitals	N	Not transferable to hospice setting.
Toolkit for healthcare facility design evaluation-some case studies (De Jager, 2007)	2007, Study: Healthcare	N	Not applicable to person-centredness.
A Planning Guide for Post Occupancy Evaluation: The ABCs of POEs (Alvaro *et al.*, 2015a)	2015, Tool: Healthcare	N	Not applicable to person-centredness.
Design and evaluation: The path to better outcomes (Alvaro *et al.*, 2015b)	2015, Study: Healthcare (complex care, rehabilitation, and long-term care services)	N	Not transferable to hospice setting.
Linking programming, design and post occupancy evaluation: A primary care clinic case study (Battisto and Franqui, 2013)	2013, Study: Outpatients	N	Not transferable to hospice setting.
ProCure23 Pre + Post Occupancy Evaluation - Pre + Post OE How to Guide	2022, Tool: Healthcare	N	Not transferable to hospice setting.

(Improvement, 2022)			
Does space matter? An exploratory study for a child–adolescent mental health inpatient unit (Trzpuc *et al.*, 2016)	2016, Study: Mental Health Facility	N	Not transferable to hospice setting.
Listening to people to cure people: The LpCp–tool, an instrument to evaluate hospital humanization (Buffoli *et al.*, 2014)	2014, Tool: Hospitals	N	Not transferable to hospice setting.
Piloting a building performance evaluation tool: Evaluation of two inpatient units at an acute care hospital in Canada (Knudtson *et al.*, 2011)	2011, Study: Hospitals	N	Not transferable to hospice setting.
Post Occupancy Evaluation Project Report: Completion of Phase 1: POE Protocol Development (ENGINEERING, 2006)	2006, Tool: Office buildings	N	Not transferable to hospice setting.
FINAL REPORT 1: Review of the Probe process' (Cohen *et al.*, 1999)	1999, Tool: General buildings	N	Not transferable to hospice setting.
Post occupancy evaluation: Development of a standardised methodology for Australian health projects (Carthey, 2006)	2006, Tool: Healthcare	N	Not applicable to person-centredness.
USEtool Evaluating Usability: Methods Handbook (Hansen and Jensø, 2009)	2011, Tool: General buildings	N	Not transferable to hospice setting.
The patients' view of their domain (Chen and Sanoff, 1988)	1988, Study: Hospitals	N	Not transferable to hospice setting.
Occupants' assessments of indoor environments: Questionnaire and rating score method (Levermore,	1994, Tool: Office buildings	N	Not transferable to hospice setting.

1994)			
Evidence-informed health care infrastructures: test of SustHealthv2 tool on hospital pilot cases (Brambilla, Lindahl and Capolongo, 2021)	2021, Tool: Hospitals	N	Not transferable to hospice setting.
Developing the Birth Unit Design Spatial Evaluation Tool (BUDSET) in Australia: a qualitative study (Foureur *et al.*, 2010)	2010, Tool: Specific: Birth Units	N	Not transferable to hospice setting.
Healthcare building sustainability assessment tool-sustainable effective design criteria in the Portuguese context (de Fátima Castro, Mateus and Bragança, 2017)	2017, Study: Healthcare	N	Not transferable to hospice setting.
A Staff and Patient Environment Calibration Tool (ASPECT) (Facilities, 2008)	2008, Tool: Healthcare	N	Lacks sufficient: POE Methodology.
Strategic Prioritization of an Occupancy Evaluation Program for Healthcare Design (Freihoefer and Rich, 2021)	2021, Tool: Healthcare	N	Not transferable to hospice setting or applicable to study purpose.
USER EVALUATION OF A REHABILITATION CENTER FOR THE ELDERLY AND HANDICAPPED (Burton, 1980)	1980, Study: Specific: Facility for older and impaired users	N	Not transferable to hospice setting or applicable to study purpose.
Application of Environmental Evaluation by Hospital Users in Health Care Facility Management (Kato and Komatsu, 1992)	1992, Study: Hospitals	N	Not transferable to hospice setting or applicable to study purpose.
BUS occupant survey method: details for licensees (Leaman, 2010a)	2010, Tool: General buildings	N	Not transferable to hospice setting or applicable to study purpose.

Table 4-6 15 Included Articles

Title and Reference	Year, Type, Setting	Reason
Post occupancy Evaluation of a Neighbourhood Concept Redesign of an Acute Care Nursing Unit in a Planetree Hospital (Rose *et al.*, 2022)	USA, 2022, Study: Hospitals	Evaluates the impact of environmental design on the efficiency and satisfaction of nurses, alongside the perceived patient care quality.
The Continuous Learning Cycle: A Multi-phase Post-occupancy Evaluation (POE) of Decentralized Nursing Unit Design (Cai and Spreckelmeyer, 2022)	USA, 2022, Study: Hospitals	Evaluates the design of decentralised nursing stations on operational efficiency, staff communication, and patient satisfaction
Environmental Physical and Perceived Quality in Hospice (Ferrante and Villani, 2021)	Italy, 2021, Study: Hospices	Evaluates environmental factors affecting the psychological needs of hospice users
The Role of Patients' Psychological Comfort in Optimizing Indoor Healing Environments: A Case Study of the Indoor Environments of Recently Built Hospitals in Sulaimani City, Kurdistan, Iraq (Mahmood and Tayib, 2020) Healing environment correlated with patients' psychological comfort: Post-occupancy evaluation of general hospitals (Mahmood and Tayib, 2019)	Iraq, 2020, Study: Hospitals	Evaluates how the physical indoor environment of hospitals influences psychological comfort and contributes to an optimal healing environment.
Perceived Importance of Wellness Features at a Cancer Center: Patient and Staff Perspectives (Tinner, Crovella and Rosenbaum, 2018) Perceived importance of wellness features at the Upstate Cancer Center: Patient and staff perspectives (Tinner, 2016)	USA, 2018, Study: Cancer centres	Evaluates the impact of building wellness features and determine their hierarchical relationships.
Evaluating Intention and Effect: The Impact of Healthcare Facility Design on Patient and Staff Well-Being (Alvaro *et al.*,	Canada, 2016, Study: Healthcare	Evaluates the influences of architectural design on psychosocial wellbeing, with emphasis on social connectedness

2016)		
Evidence-based design in an intensive care unit: End-user perceptions (Ferri *et al.*, 2015)	Canada, 2015, Study: Specific: ICU	Evaluates Impressions and experiences in a newly constructed ICU built using evidence-based design
Development of Hospice Environmental Assessment Protocol (HEAP): A post occupancy evaluation tool (Kader, 2017)	USA, 2017, Tool: Hospices	Develops a tailored post-occupancy evaluation tool for hospice settings, emphasising physical and organisational features
The Inclusion, Diversity, Equity and Accessibility audit. A post-occupancy evaluation method to help design the buildings of tomorrow (Zallio and Clarkson, 2022)	UK, 2022, Tool: General buildings	Develops an evaluation tool for buildings related to the challenges around inclusion, diversity, equity, and accessibility.
Ambulatory infusion suite: pre- and post-occupancy evaluation (Shepley *et al.*, 2012)	USA, 2012, Study: Cancer centres	Evaluates the impact of the new infusion suite design on social interaction, privacy, and access to nature and daylight.
Assessment of Healing Environment in Paediatric Wards (Ghazali, 2010) Healing Environment: Status and Design Trend of Pediatric Wards (Abbas, 2009)	Malaysia, 2010, Study: Paediatric wards	Evaluates the design quality of physical environments in paediatric wards on satisfaction and the creation of healing environments.
Establishing psychological wellbeing metrics for the built environment (Watson, 2018)	USA, 2018, Tool: General buildings	Develops psychological wellbeing metrics for the built environment, integrating psychological wellbeing models with financial reporting to produce transferable, monetised evaluation metrics.
Exploring the Use of the AEDET Hospital Evaluation Toolkit to Create a Better Healing Environment for Cancer Patients beyond the Global North (Tekbiyik Tekin and Dincyurek, 2023)	Cyprus, 2023, Both: Oncology hospitals	Evaluates the effectiveness of the AEDET evaluation toolkit in assessing hospital environments, focusing on physical environmental attributes that influence health outcomes and wellbeing
Does the design of hospitals meet the needs of older people? An evaluation of three acute-care settings (Barnes, Torrington	UK, 2016, Both: Specific: Acute-Care	Develops and tests a matrix to evaluate hospital design in supporting specific needs of older people.

and Lindquist, 2016)	Units	
A post occupancy evaluation of the Dundee Maggie Centre (Stevenson and Humphris, 2007)	UK, 2007, Both: Cancer centres	Evaluates the design and physical performance of a Maggie Centre on its impact on their health and wellbeing

4.5 Evaluating Wellbeing

As wellbeing is subjective, it is often measured through self-reports (Eid and Larsen, 2008), but objective measures can help validate evidence for producing government policies (Diener, 2009). This was evident within a systematic literature review by Zhang, Tzortzopoulos and Kagioglou (2018). They coined the term “healing-built environment” (HBE) to describe stress-reducing and health-promoting healthcare buildings. The review examined 127 papers on scientific evidence related to HBE. They found many existing studies focused on the impact of a single HBE aspect against one health outcome. In addition, they found no consistent evaluation approach across these studies, concluding that there was a “lack of an adequate method that integrates credible findings holistically to demonstrate the cumulative and interactive effects of various environmental aspects on occupants' wellbeing” (Zhang, Tzortzopoulos and Kagioglou, 2018: 759). However, the authors were not critiquing the “most suitable” evaluation method but rather documenting various aspects to create a comprehensive environment–occupant–health (E-O-H) framework to “identify and evaluate different HBE characteristics used in future evaluation projects. The framework incorporates three design principles: (1) a comfortable environment; (2) a well-functioning healing space; and (3) a relaxing atmosphere. It attempts to consider the interplay between interrelated and diverse HBE factors and their impact on multiple health outcomes. They provided an example: an appropriate lighting level can provide (1) a comfortable environment that is neither too bright nor too dull; (2) a well-functioning space (safety) by reducing medical errors; and (3) a relaxing atmosphere by impacting the perception of signage, which alleviate stress

levels. Ultimately the framework "considers that people are multi-dimensional and that healthcare buildings are also multi-dimensional. It also considers that one dimension can influence many others, directly or indirectly" (Zhang, Tzortzopoulos and Kagioglou, 2018: 759).

Wellbeing is such a broadly defined term and is influenced by many factors. Therefore, for this study, it was necessary to establish criteria that would be constantly implemented over all research methods to evaluate the environment efficiently and effectively. The term "wellbeing" can often refer to a multitude of elements, with this study drawing on Mary Jo Kreitzer (2012), a nurse, professor, and health researcher, who defines wellbeing as "a state of being in balance and alignment in body, mind, and spirit" (Kreitzer, 2012: 707). The wellbeing model summarises elements that influence wellbeing: health, relationships, security, purpose, community, and environment (Kreitzer, 2012). Defining wellbeing as:

- "Health: physical, emotional, mental, and spiritual health.
- Purpose: an aim and direction, a direct expression of spirituality that gives life and work meaning.
- Relationships: social connections, networks, and the quality of relationships.
- Community: resources and infrastructure and the extent to which people are engaged and empowered.
- Environment: access to nature and clean air, water, and toxin-free.
- Security: basic human needs, stable employment, sufficient finances, and personal safety."

(Kreitzer, 2012: 708-709)

One tool currently in use within the hospice which could be described as measuring wellbeing, although treatment, rather than building, related is the Outcome Assessment and Complexity Collaborative (OACC) suite of measures. Research into this came about through informal discussion with the PPWH Education Facilitator as it could provide valuable insight for the creation of a POE focused on person-centred principles. The specific tool the hospice utilised was the Integrated Palliative Care Outcome Scale (IPOS) (formally the Palliative Care Outcome Scale (POS)) which is

a survey tool for those with advanced illness, not just measuring QoL or physical symptoms but also psychological, emotional and spiritual needs and communication and support (Hearn and Higginson, 1999; Oriani *et al.*, 2019): the tool covering "patients' main concerns, common symptoms, patient/family distress, existential wellbeing, sharing feelings with family or friends, information received, and practical concerns" (Murtagh *et al.*, 2019: 1046). The tool begins with an open-ended question, "what have been your main problems or concerns" setting a precedent for a different way to assess patient outcomes (Oriani *et al.*, 2019: 776). Establish a person-centred approach to understanding the reasoning behind a patient's view on their health outcomes. This supported them to provide, and acknowledge the importance of, provision of support beyond medical intervention. For example, one staff member recounted that a patient indicated prominent levels of distress that medication could not stabilise. However, completing the IPOS it was discovered their distress was linked to feeling worried about their pets left at home. Which enabled staff to discuss solutions with the patient and ultimately showed improved patient outcomes score. This highlights that elements impacting wellbeing and subsequent health can often be highly individual but have significant impacts.

4.6 Conceptual Framework

For this project a conceptual framework (Table 4-5 to Table 4-10) was developed, based on a review of existing EBD and POE literature, desktop review of the PPWH building's brief design statement and initial and consultation documentations, a short ethnographic study, and findings from the Pilot Study: this was further refined through informal discussions with staff and other palliative care researchers.

The framework informs the development of the subsequent chapters by underpinning this study's methodology (Chapter 5), design (Chapter 6), and methods (Chapter 7). The framework and subsequent chapters form a Hospice POE Toolkit, which indicated the key research principles. which determined the performance of the PPWH against its expected outcomes while also informing lessons learned for future projects.

Chapter 9 provides a critique of relevant POE methodologies, identified in the scoping review, against this conceptual framework. Based on this, it was concluded that taking forward the most salient and discriminating features of each would best inform a novel Hospice POE Toolkit which holistically evaluates the particularities of the organisation and palliative care environment, in addition to the aspirations outlined in the brief and issues found within the Pilot Study of the previous PPWH facility.

The conceptual framework consists of six domains that encompassed data gathering from five participant groups across 13 wellbeing and five environmental quality evaluation criteria. The domains and criteria were influenced by Zhang, Tzortzopoulos and Kagioglou (2018) E-O-H framework and Kreitzer (2012) definition of wellbeing: providing a framework for POEs focusing on person-centred architectural features. Unlike other healthcare evaluation studies, it does not focus on clinical health outcomes (such as reduced length of stay or medication use) but rather establishes a thematic analysis that draws out common themes and influences across wellbeing outcomes.

Table 4-7 Framework: Domains

Domains	Description
Choice	Focus on aspects such as privacy, relationships, preferences, and the sense of control available to users.
Inclusion	Focus on accessibility, fostering independence, and enhancing a sense of purpose and belonging within the environment.
Noise	Focus on decibel (dB) levels and users' perceptions of these sounds.
Indoor Air Quality (IAQ)	Focus on temperature, relative humidity, CO2 levels, and users' perceptions of these elements.
Design	Focus on architectural and interior design, focusing on aesthetics, functionality, and the therapeutic aspects of the environment.
Nature	Focus on the integration of natural elements such as plants, gardens, and natural views, and their impact on the facility's ambiance.

Table 4-8 Framework: Participant Groups

Participants	Description
Patient	Individuals receiving care and treatment within the facility.
Clinical Staff	Healthcare professionals directly involved in patient care, such as doctors, nurses, and therapists.
Non-clinical Staff	Employees who support the healthcare environment but are not directly involved in patient care, such as administrators, maintenance, and IT personnel. This also covers volunteers.
Family	Relatives and close individuals associated with the patients, who may participate in care or visit regularly. In this specific hospice this will also relate to 'clients' who use the family support services area.
Visitor	Individuals who visit the facility for reasons other than receiving care, including friends of patients and professional visitors.

Table 4-9 Framework: Wellbeing Evaluation Criteria

Wellbeing	Description
Comfort	Evaluate physical comfort.
Control	Evaluate control over environment.
Privacy	Evaluate privacy.
Safety	Evaluate security measures and safety.
Sense of Belonging	Evaluate environment that fosters belonging.
Dignity	Evaluate respecting dignity.
Nature	Evaluate integrating natural elements into the environment.
Art	Evaluate of the use of art and décor.
Family Spaces	Evaluate spaces available for family members.
Social Interaction:	Evaluate facilities or areas that promote social interaction.
Visibility	Evaluate visibility for staff and patients.
Accessibility	Evaluate accessibility, including those with specific needs.
Adaptability	Evaluate the ability to adapt to changing needs or circumstances.

Table 4-10 Framework: Environmental Quality Criteria

Environmental Quality	Description
Temperature	Measure and evaluate temperature.
Ventilation	Measure and evaluate air flow and ventilation quality.
Noise	Measure and evaluate noise.
Natural Light	Measure and evaluate natural light.
Artificial Light	Measure and evaluate artificial lighting.

4.7 Conclusion

This chapter introduced the concept of “reliable evidence” in the context of the architecture profession, going on to detail the history and use of building evaluation studies starting from the mid-20th century. It introduced common tools for assessing building performance and identified POE methodologies used in healthcare environments. The chapter concluded by describing the conceptual framework used to inform this study. The following chapter discusses the research methodology and its implications for this study.

Chapter 5
Research Methodology

This chapter justifies the methodology that complements the theoretical and conceptual frameworks of the previous chapters. Firstly, an introduction to the key stakeholders' involvement and importance in the evolution of the study will be illustrated, which impacted the direction and primary aims of the research. Secondly, the reasoning behind the mixed methods case study methodology is presented, informed by reviewing the paradigm wars and philosophical perspectives concerning this study. Thirdly, the typical positivist orientation used for building evaluation studies will be presented, and an explanation of why this study is instead using a pragmatic constructivist orientation. The chapter then delves into the implications these have on the methodology, before finally going on to discuss the divide between disciplines and the benefits of interdisciplinary collaboration across architecture and healthcare research fields.

5.1 Evolution of the Study

"The successful design and delivery of a project has always been about the right people, team relationships, the use of proper techniques, and the implementation of the appropriate tools" (Christiansen, 2009: 26).

5.1.1 Co-Creation with Stakeholders

Schramm (1971: 12) warns that "when the reputations of real people and the policies of real systems are at stake, this may be a rather frightening responsibility". Particularly when many people are deeply invested in the project and looking for

positive outcomes, to combat this concern, a BRMG was set up to support the research and ensure all stakeholders were informed of progress and direction. This primarily consisted of the PPWH Director Of Clinical Services and two researchers, including the Principal Researcher from the University of Strathclyde. Additional input from other relevant members of PPWH staff included the Director of Operations, Clinical Governance Coordinator and The Practice Development Facilitator. This study evolved from discussions between the PPWH organisation and the project architects, meaning the initial aims were established before the formal commencement of the study. Helping establish a bid to generate funding for the research project by defining the key aims and expected outcomes. The most prominent feature was conducting an in-depth POE study to disseminate findings from the innovative care model used within the IPU. This focus informed the previous chapter, defining and contextualising POEs while identifying methods to guide the evaluation of the care model.

However, as cautioned by Stake (1995: 135), “a study may fail just because too many demands were made of it”. This was evident at the study's beginning due to expectations and input from the organisation, architects, university, and supervisor. After the study's inception with the research on POEs, informal discussion with the organisation and on-site observation, it was clear that an in-depth POE of all elements was not achievable. Therefore, the research moved away from the traditional technical and cost-focused POE in discussion with the organisation. Instead, it focused on the person-centred aspects of the project, which would align with the inherent values of the organisation. The organisation's vision and the researchers' prior research experience in architecture and environmental psychology provided the foundations for evaluating the environment against person-centred factors related to the wellbeing of people. To that end, the initial months of the study involved finding an appropriate methodology and methods that would allow flexibility for the research to evolve with the progression of the study and findings rather than be constricted to pre-defined procedures. This would be achieved by accessing literature from different research fields. The study, therefore, is situated within the realm of interdisciplinary research, a term that encapsulates research that

is:

- Multidisciplinary: the joining of two or more disciplines, with each producing discipline specific results;
- Cross disciplinary: crossing between disciplines to help explain a subject in relation to another discipline; and
- Transdisciplinary: dissolving the boundaries between disciplines to achieve deeper insight and expand the knowledge base of a discipline.

(Repko, 2012; Sarvimaki, 2018)

This study constitutes transdisciplinary research, aiming to dissolve boundaries between the disciplines of architecture and healthcare research, achieving insight that furthers the knowledge base for each. Contributing to the EBD knowledge base, enriched by environmental psychology, encapsulating sociology and psychology (Brandt, Chong and Martin, 2010), it "transcends the narrow scope of disciplinary worldviews" and helps develop "new theoretical frameworks for understanding social, economic, political, environmental and institutional factors in health and wellbeing" (Klein, 2010: 24). However, interdisciplinary research can be challenging due to the varying terminology between disciplines and researchers (Sarvimaki, 2018). Therefore, a method to combat this should be achieved to provide understanding among the entire group (Groeneveld *et al.*, 2019).

5.2 Environmental Psychology

Environmental psychology is the interdisciplinary study of the influence environments have on individuals (Wener, 2012). It is rooted in social sciences as it utilises scientific methods and explanations to understand human behaviour. The most relevant aspects to design are linked to sociology and psychology (Brandt, Chong and Martin, 2010). It is a relatively new branch of psychology, with Egon Brunswik (1903-1955) first using the term "environmental psychology" in his theoretical work (Pol, 1993). He studied the process of environmental perception (the gathering of information through our senses) and environmental cognition (how we process, store, and recall information). Although never performing any empirical

studies in the field, his ideas established the intellectual basis for environmental psychology as it is known today (Gifford, 2007). Willy Hellpach (1877-1955) was one of the first academics to conduct a set of studies in the field in the early 20th century. He was a German physician and psychologist interested in environmental and urban issues within psychology. His research explored the influence that natural, social, and historical-cultural environments had on individuals. He also researched the influence different environmental stimuli had upon people, such as the effect of colour and form, the sun and moon stages, and environmental extremes. Along with his pioneering research in environmental psychology, he examined the difference between urban and rural life, concluding that while the urban environment provides more independence, it can also lead to feelings of isolation. He identified crowding, overstimulation, and a constant state of alert as potentially problematic factors within the city environment (Pol, 1993).

In tandem with the rise of POE within the British architectural profession, in the late 1960s, systematic evaluations of buildings started to appear. However, they weren't the work of architects but researchers working within the newly emergent field of environmental psychology (Cooper, 2001). It was officially recognised as a field of study in the late 1960s (Pol, 1993) with the aim of using this knowledge to solve a wide variety of problems. More recently, extensive research by Ulrich *et al.* (2004), Ulrich (2007) and Pretty (2006) explored the field of environmental psychology and established convincing links between the environment and human health and behaviour. Evidence-based design can arguably be associated with this social science discipline. It is most strongly associated with urban (Jane Jacobs and William H. Whyte) or interior space (Robert Sommer). The Environmental Design Research Association (EDRA) was established in 1968 to improve understanding of the relationship between people and their environment and to establish spaces that respond to human needs (Brandt, Chong and Martin, 2010). Brandt, Chong and Martin (2010) categorised six key areas of investigation in environmental psychology, which were:

- Attention, which looks at developing an understanding of how people

voluntarily and involuntarily notice their environments;

- Perception, which looks at the ability of people to formulate cognitive maps of their environments;
- Preference, which looks at the theory that people seek out environments where they are comfortable, which helps to build confidence and engagement;
- Environmental stress and coping which can cover noise and temperature but also uncertainty, unpredictability, and overload;
- Participation, which looks at enhancing people's engagement in environmental design, management, and restoration; and
- Conservation Behaviour, which explores people's attitudes, perceptions and values towards their environments and devises a strategy that promotes positive behaviours.

The research methods for environmental psychology are varied and include questionnaires, laboratory experiments, simulation studies, field studies and case studies (Wener, 2012). Early studies into environmental psychology focused on the design of the built environment and its effect on human behaviour and wellbeing. However, as interest in environmental psychology grew, the focus shifted towards addressing not only design but also issues involving environmental sustainability. To that end, and somewhat ironically, the influence of human activity on the earth's environment became an important area of investigation; as it was apparent humans were generating negative impacts in terms of air pollution, urban noise, environmental quality, and overconsumption, which were assessed concerning health, wellbeing, and sustainability (Pol, 1993).

5.3 Guiding the Research Process

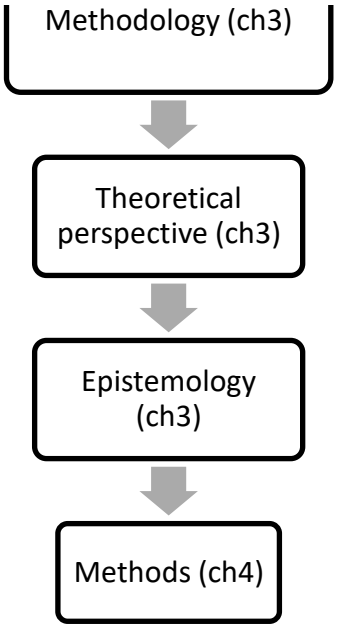
An invaluable resource for beginning to understand, define and plan the research process for this study was derived from "The Foundations of Social Research" by Crotty (1998). This process aligns with Crotty's vision of instilling "a sense of stability and direction" in which the researcher can "move towards understanding and expounding the research process after their own fashion in forms that suit their particular research purposes" (Crotty, 1998: 2). Embodying this vision, reference to

this text has been included throughout this chapter to explain the foundations of the research process while expanding on each with the researchers' ideas.

5.4 Rationale for Case Study Methodology

Methodology is “the strategy, plan of action, process or design lying behind the choice and use of particular methods and linking the choice and use of methods to the desired outcome” (Crotty, 1998: 3). Typically, before determining the methodology, the philosophical underpinnings of a study would be introduced (Crotty, 1998). However, among the initial decisions within the study, one of the first was that it would be a case study methodology, determined by the nature of the topic being a particular “case” and aligning with the anticipated scope and outcomes. Therefore, it makes sense to explain them in sequence of introduction to the study (Figure 5-1), each influencing its successor. Although the methodology was fundamentally predetermined, it was still essential to research and develop the case study strategy and protocols. The methodology made it apparent that case studies shared parallels with Mixed Methods Research (MMR). Research into these two methodologies provided an opportunity to combine the two. The simplistic rationale for a mixed-methods case study research design is that the “case study” focuses on a

Figure 5-1 The four basic principles of the research process, as adapted from Crotty (1998 p. 4).



bounded system or case (Brown, 2008; Merriam and Tisdell, 2015; Stake, 1995; Yin, 2018), and MMR combines qualitative and quantitative approaches to provide insight beyond the limitations of one method alone (Creswell and Creswell, 2018). This is a style choice which, in design research, could be argued involves an element of creativity, mirroring that of the design process itself (Sarvimaki, 2018).

Case studies have a history of being utilised within health due to their ability to capture the vagaries within a clinical setting: “the more the researcher has intrinsic interest in the case, the more the focus of study will be on the case's uniqueness, particular context, issues, and story” (Stake, 2003: 155). One primary purpose of a case study is to contribute to policy and decision-making (Schramm, 1971). The case study provides an in-depth focus to match the research aims to produce a “holistic and real-world perspective” (Yin, 2018: 5). The flexibility and potential for practical application are arguably one of the key strengths of a case study (Luck, Jackson and Usher, 2006: 107). A case study can focus on various subjects from decisions, individuals, organisations, processes, programmes, neighbourhoods, institutions, and events (Schramm, 1971; Yin, 2018). Although it could be argued this “case” focuses on the new hospice facility, it is more complex than that. It is more apt to see the case as a “set of decisions”, which began with an initial idea, sparked by a patient, for the development of a new hospice facility, addressing important considerations within the decisions, “why they were taken, how they were implemented, and with what result” (Schramm, 1971: 6). The uniqueness of this research design lies within the focus of the case itself (Stake, 2003). Interestingly, a common challenge of case study research is identifying the case itself (Creswell, 2018), which was not a challenge concerning this study. The most important aspect of this case study was evaluating and disseminating findings from the Sengetun care model. The decision to collect and analyse data from existing and new facilities challenged time and resources. However, it allowed the researcher to develop and hone research methods and skills before evaluating the new environment.

The case study is not always fully embraced: its pragmatic nature is viewed as inconsistent with more traditional methodologies (Luck, Jackson and Usher, 2006).

Unlike an experiment, it cannot guarantee that results can be reproducible (Schramm, 1971) and it can be hard to produce generalisation due to an in-depth focus on a single or few cases (Stake, 1995). However, repetition within findings in the case can create "particularisations" that can contribute to the expansion and generalisation of theory (Stake, 1995; Yin, 2018). Additionally, credibility might be obtained by continuously making descriptions and interpretations during the study (Yin, 2018). The greatest weakness of the study is the burden of responsibility the case study approach places on the researcher. Other methods offer certain specifics and procedures, but case studies offer fewer predetermined guides. Instead of restricting data collection to specific pre-defined criteria, collecting as vast and varied a range of information as possible is encouraged. The success of each case can be measured by how well the researcher interprets and presents the findings (Schramm, 1971). A case study need not cover only a specific element of a case but can deal with the project as a whole. This means that what is lost in detail is gained in the breadth of research, allowing the reader to determine what aspects of the decision and its results might apply to their projects (Schramm, 1971). However, traditional flowing narratives can lead to lengthy, sometimes unreadable, documents (Yin, 2018). Another downfall of case study research is that if the study is begun too late, then the researcher could lose valuable evidence. As warned by Schramm (1971: 8), "when the early history has mellowed, some of "the early problems and failures have been forgotten, and the skein of policymaking can be restored only through the memories of men who have been too closely involved to be objective about it".

Following a clear methodological path is the starting point for solid case study research, which should be clearly defined before starting. Producing "a sufficient blueprint for your study" can help manage and guide the research process (Yin, 2018: 35), for example, helping to determine the type of data to collect and how it should be analysed (Groat and Wang, 2013). A case study should be built on sound design, with the research questions integral to this. Identifying 10-20 perspective questions early is a good starting point as within qualitative projects, issues typically "emerge, grow, and die" (Stake, 1995: 21). Conversely, within quantitative research, issues can become "more refined or important" (Stake, 1995: 21). Typically, a

starting point would be to produce a literature review and define research questions. An alternative approach would be to conduct preliminary fieldwork (Yin, 2018). With this in mind, this study began with scoping fieldwork in tandem with the desktop review. Furthermore, a review of documents is essential when researching in an "unfamiliar culture" (Schramm, 1971: 17), so physical immersion in the environment should provide a further understanding of the organisation's culture and palliative care environment. A project protocol was developed to plan and manage all aspects of the project, as found in Appendix 1.

This case study research adopts an embedded single-case design (Yin, 2018) by looking at various separate but interconnected aspects. In some studies, adding a second research method can enhance understanding of one or more study phases. The benefits of this have been recognised in this study by adopting MMR (Tashakkori and Creswell, 2008). As with case study research, MMR can address complex real-world problems and is often used within health research (Bishop, 2015). By drawing multiple meanings from findings, MMR can complement the ideas identified and explored in case study research (Creswell and Plano Clark, 2017; Stake, 1995). Lending itself for use in this study, with findings being driven by the nature of the problem without the limitations of a purely qualitative or quantitative paradigm. This embedding MMR case study design primarily focuses on qualitative data but was supported by quantitative data (Creswell and Plano Clark, 2017).

Quantitative research is used for testing objective theories. Instruments may be used to measure and obtain numerical data that can be analysed through statistical procedures—focusing on a deductive approach, testing theories, and producing generalised findings that can be replicated (Creswell and Creswell, 2018). Qualitative research explores or understands the meaning people assign to a social problem. Typically taking an inductive approach, the researcher draws interpretations from the data. This method focuses on particular meaning and places importance on documenting the complexity of a topic. Qualitative research methods became widely accepted, developed, and adopted across the social sciences from the late 19th century. At the time, sociology and anthropology qualitative research was often

ethnographic: involving understanding the culture of the group, including behaviours, beliefs and values, usually achieved through immersion in communities (Ritchie *et al.*, 2013). "[T]he role of qualitative evidence in design research case studies … not only provides new views of looking at the built environment but also allows creativity both in the research design and in the data generation techniques, especially regarding the thick descriptions of a setting within this particular theoretical framework" (Sarvimaki, 2018: 143). This highlighted the importance of immersion in the hospice environment to adequately understand the perspective and experiences being described by participants and present the findings accurately.

5.5 Paradigm Wars: Philosophical Debate (Ontology and Epistemology):

With the decision of the methodology concluded, attention now turns toward theoretical perspective and epistemology, firstly introducing two of the four basic principles of the research process (Figure 5-1). A theoretical perspective is "the philosophical stance informing the methodology and thus providing a context for the process and grounding its logic and criteria" (Crotty, 1998: 3). Epistemology is "the theory of knowledge embedded in the theoretical perspective and thereby in the methodology" (Crotty, 1998: 3).

A scientific paradigm can be used to understand these terms, which will inform the topic of inquiry, the research questions, the research design, data collection and analysis strategies (Sarvimaki, 2018). Firstly, some key concepts must be defined. "a paradigm is a basic set of beliefs that guide action" (Guba, 1990: 17), beliefs which are commonly "shared by members of a research community" (Donmoyer, 2008: 591), sometimes referred to as a worldview (Creswell and Creswell, 2018; Lincoln, 1990; Schwandt, 2014) or ontology and epistemology (Crotty, 1998). Ontology is the study of "being", and epistemology deals with the "nature" of knowledge (Crotty, 1998). Research design can be defined by ontology (nature of reality) and epistemology (nature of knowledge or ways of knowing) that align with the research questions (Sarvimaki, 2018). Crotty (1998) purposefully excluded "ontology" from his research process framework (Figure 5-1) due to his view of ontology and

epistemology being challenging to separate from one another: “to talk about the construction of meaning (epistemology) is to talk of the construction of a meaningful reality (ontology)” (Crotty, 1998: 10). There are many nuances within paradigms, but positivism and interpretivism are opposite ends of the philosophical spectrum. Those favouring quantitative methods would typically align with a positivist orientation, assuming one reality exists independent of the researcher (Merriam, 2009). Empirical science is closely linked to positivism (Crotty, 1998), with knowledge gained described as “scientific”. On the other end of the spectrum, interpretivism believes multiple realities exist, and that meaning is not discovered but constructed (Crotty, 1998). The term constructivism can be used interchangeably with this perspective (Merriam, 2009).

Now that the critical terminology has been defined, the attention turns to the subsequent “war”. The “paradigm wars” was a phrase coined by Gage (1989) and describes the conflict between academics and scholars from the qualitative and quantitative disciplines during the 1980s; the objectivity-seeking quantitative researchers were being “attacked” and surpassed by the prosperous anti-naturalists, interpretivists, and critical theorists (Gage, 1989). In the 20th century, German philosopher and mathematician Edmund Husserl criticised the objective scientific methods used to study human issues, arguing “that life should be examined as people experience it” (Sarvimaki, 2018: 72). His theories were the grounding for phenomenology to flourish. Phenomenology is an important tool in sociology, which focuses on the meaning people assign to a particular phenomenon, concept or idea (Ritchie *et al.*, 2013). It aims to understand how humans view themselves and the world around them, seeking to reveal and convey deep insight and understanding of concealed meanings in everyday experiences. The findings are rigorously descriptive, exploring relationships between people and situations and explained through the researcher's intuition and analysis means that researcher. Therefore, researchers are considered inseparable from assumptions and preconceptions about the study phenomena, and bias is a natural feature of this research, with attempts made to explain and integrate them (Robson and McCartan, 2016; Sarvimaki, 2018). These methods of philosophy have provided a way to interpret concepts such as “the

spirit/sense of place (genius loci) and the meaning of home or dwelling" (Sarvimaki, 2018: 156). Interestingly, the case study methodology chosen for this study also originates from sociologists and is a rigorous way to design case studies of social settings to analyse, evaluate, and communicate outcomes (Sarvimaki, 2018). The similarities between the methodologies helped to bring awareness to detecting these within this study.

However, an innovative approach means the choice is not limited to these two distinct paradigms. One that combined qualitative and quantitative research and heralded as the "third methodological movement" (Tashakkori and Teddlie, 2003: 5) or even a stand-alone research paradigm (Groat and Wang, 2013; Johnson and Onwuegbuzie, 2016). It is known as pragmatism; pragmatism focuses on "what works", recognising the value of objective and subjective knowledge (Creswell and Plano Clark, 2017; McCaslin, 2008). There are three dominating research approaches; qualitative, quantitative, and mixed methods.

Simply put, a research approach is the plan and procedures for research and involves considering a philosophical worldview, research design and methods. Decisions on the approach are often determined through the researcher's philosophical assumptions, strategy, and associated research methods (Creswell and Creswell, 2018). These research approaches are intrinsically linked to research paradigms. Quantitative research traditionally aligns with positivist or post-positivist epistemologies, while qualitative research is aligned with constructionist or interpretive epistemologies (Bishop, 2015; Creswell, 2018; Yardley and Bishop, 2008). Adopting an MMR design should consider the epistemological differences between qualitative and quantitative research; typically, a realist belief within post-positivist and a relativist belief with constructionist or interpretive (Bishop, 2015). The incompatibility between the constructivist and positivist perspectives may seem apparent at first. The constructivist viewpoint challenges the controlled experimental techniques used in positivist research, arguing that they eliminate the individual voice by imposing predetermined measures that have little meaning beyond the controlled study. Conversely, the positivist perspective questions the reliability and

scientific accuracy of the data produced by qualitative research, which often lacks robust design and analysis, increasing the risk of bias (Yardley and Bishop, 2008). Poorly employed qualitative or quantitative approaches can lead to problems when analysing and interpreting findings. Lack of awareness of methods can lead to the contextual and symbolic meanings of qualitative data being overlooked and quantitative reliability and credibility measures insufficiently addressed (Bishop, 2015; Yardley and Bishop, 2008). Thus, developing a theoretical framework can aid in successfully integrating qualitative and quantitative methods (Yardley and Bishop, 2008).

5.5.1 The Tension Between Architecture and Social Research

A further consideration in establishing a suitable paradigm for this study was balancing a building evaluation study, typically more objective, focusing on wellbeing, and typically more subjective. Although building evaluation studies have a firm foundation in social sciences, they were traditionally viewed as different from experimental methods: "Architectural methods sometimes resemble scientific ones, and a process of research, such as science employs, can also be adopted in architecture. Architectural research can be increasingly methodical, but the substance of it can never be solely analytical. Always there will be more of instinct and art in architectural research" (Aalto, 1998: 77). Brown (2018) criticises the traditional POE tending to overlook the social aspect of architecture in favour of technical aspects of building performance. This is reflected in the detached terminology used, such as Zimring and Reizenstein (1980) description of a POE as an "examination of the effectiveness for human users of occupied designed environments". Typically, POE is person-centred, focusing on how individuals think and feel about the places around them. In contrast, social research is place-centred, focusing on psychological constructs of space quality from a human perspective (Behloul, 1991). Friedmann, Zimring and Zube (1978) highlighted some key differences between each: social science often attempts to control extraneous factors, being concerned with behavioural causes, and focusing on a few specific factors: on the other hand, evaluation studies are more concerned with describing factors, determining the influence on behaviour and often focus on complex multifactorial factors.

Furthermore, social science is by nature critical, without outcomes often concerned with issues or areas for improvement. In evaluation studies, equal consideration is given to what works and should be kept. Aalto (1998: 77) acknowledges these distinctions between both disciplines and why they should not be merged but rather work together in harmony:

> "architecture has often been compared with science, and there have been efforts to make its methods more scientific, even efforts to make it a pure science. But architecture is not a science. It is still the same great synthetic process of combining thousands of definite human functions and remains architecture. Its purpose is still to bring the material world into harmony with human life. To make architecture more human means better architecture, and it means a functionalism much larger than the merely technical one. This goal can be accomplished only by architectural methods- by the creation and combination of different technical things in such a way that will provide for the human being the most harmonious life" (Aalto, 1998: 77).

There have been long-standing tensions between designers and those who assess their buildings, partly due to the "false dichotomy between the sciences on the one hand and the humanities and arts on the other" (Fisher, 2018: pvii). This was debated at length within Snow and Collini (2012) writings on the seemingly irreconcilable division between these "two cultures". Fisher (2018) states that some in the architectural profession view the art of architecture and the social science of environmental psychology as occupying vastly different worlds and, as such, regard each other with suspicion. However, he refutes this view by stating the "discipline of architecture, by its very nature, straddles the sciences and the arts, requiring calculation as much as creativity. Furthermore, the practice of architecture demands an understanding of the psychological, sociological, and anthropological implications of the built environment" (Fisher, 2018: pvii). Neglecting these social sciences can lead to the clients or occupants receiving a poorly performing and dysfunctional building. Fisher (2018) believes that a real challenge was not simply bridging the divide between these two cultures but ensuring good communication between researchers and practitioners. This was reflected in the lack of topic specific peer-reviewed journals and networks, meaning there was no effective knowledge

exchange between academia and practitioners (Fisher, 2018). The critical perspective of social science can often lead to conflicts and designers feeling threatened by outcomes. If firms evaluate their designs, measures should be in place to reduce bias, including pre-existing criteria for measuring environments (Friedmann, Zimring and Zube, 1978). These issues are deeply rooted within architectural education.

Salingaros and Masden (2008) argue that architectural education does not provide a sufficient background in the discipline's processes, principles and procedures that other professional or scientific disciplines such as medicine, law, engineering, mathematics, physics, chemistry, and biology provide. They criticise the constraints of the "paradigm of contemporary design" on the current model of architectural education, the Bauhaus model dominating Western architectural education since the early 20th century (Salingaros and Masden, 2008: 129). Students often come to the programme with a limited understanding of the discipline, further impeded by architectural education seeking to deconstruct any pre-existing thoughts or beliefs about architecture and restructure these to focus on the limitless freedom of creativity: epitomised in the typical introduction to the course as out-of-context design exercises often "[d]ivorced from history, and from any evidence-based knowledge or practical applications" (Salingaros and Masden, 2008: 135). In addition, the design studio can fail to sufficiently address practical issues (such as clients' concerns and needs, costs, safety, regulations, etc. This can limit learning to purely aesthetic forms and broadly excludes the importance of cultural or contextual aspects, further impeded by easy access to image-based learning and exposure to obscure architectural language and text. They argue that "if architecture is to sustain humanity, it must be fundamentally based on structural principles found in the physical universe, supplemented with a deep understanding of the human psyche: of human needs, activities, and perceptive mechanisms" (Salingaros and Masden, 2008: 135). They propose an evidence-based criterion could help objectively determine the actual value in architecture: Intelligence-Based Design, which will re-establish the discipline architecture as a knowledge-based discipline: combining design thinking with neurological engagement to human functioning and scientific logic, with a particular focus on wellbeing.

However, the division between architecture and social sciences in education hasn't always existed. Manuela Mendes, Sá and Cabral (2017) describe the historic interdisciplinary fusion of architecture and social sciences within education. Focusing on the systems in France and Portugal, the latter's 1957 reform of the architecture course directly emphasised the importance of a multidisciplinary perspective. Specifically epitomised by the School in Portugal: in Porto, they studied architecture's cultural and anthropological aspects, and in Lisbon, they focused on political topics and adopted an interdisciplinary approach by introducing social sciences, geography, and economics. Throughout the 1960s and 1970s, France also acknowledged an inherent link between the disciplines, leading to social science subjects being incorporated into the architecture curriculum. However, it was "necessary to transcend disciplinary boundaries and create a common terminology" as social science professors attempted to define what is relevant to the built environment that can be practically applied (Manuela Mendes, Sá and Cabral, 2017: 37). This culminated in utilising ethnographic perspectives and developing new observation methods and concepts for ways of thinking about space. Since then, there have been many changes within the education system due to the Bologna declaration, with architecture and urban planning courses becoming more monodisciplinary. However, there have been attempts to introduce elective classes within the social sciences in recent years, guiding "students towards the worship of impactful, architectural works and not preparing them for didactical, practical, experimental and interdisciplinary briefs" (Manuela Mendes, Sá and Cabral, 2017: 40). Reflections from Manuela Mendes, Sá and Cabral (2017) suggest interdisciplinarity and collaboration between subjects could holistically respond to the increasing complexity in the world. Enacting a change from the currently dominating reductive analysis perspectives in training and education in architecture and urban planning. As introduced within the previous chapter, BPE and the adoption of soft landing principles could help to bridge this gap between the "two cultures" in a "non-dichotomous and non-hierarchical interweaving of architecture and social science" (Fisher, 2018: pvii).

5.5.2 Flexibility Within Mixed Methods Case Study Epistemology

The research question then asks "how", helping identify specific aspects of the environments that impact wellbeing (Yin, 2014). Case studies, as an "all-encompassing mode of enquiry...can embrace different epistemological orientations" (Yin, 2018: 18). As discussed within the methodology section, case studies are flexible in how the philosophical underpinnings can be applied or offer "a bridge across the paradigms" (Luck, Jackson and Usher, 2006: 108). Case study research offers flexibility that is not as inherent in other research approaches, such as grounded theory or phenomenology. As case studies are designed to suit the specific "case" and research question, published case studies often vary in research design (Hyett, Kenny and Dickson-Swift, 2014). These can even be reflected in the three varying epistemological views by Merriam (2009); Merriam and Tisdell (2015) Yin (2018), and Stake (1995); Stake (2003), who are frequently cited authorities in establishing the foundations of the case study methodology. Yin's work is situated within the positivist discipline (Yazan, 2015; Brown, 2018; Harrison et al., 2017) stating that "a case study is an empirical method" (Yin, 2018: 15) and "like experiments, are generalisable to theoretical propositions and not to populations or universes" (Yin, 2018: 20). Conversely, Stake and Merriam are situated within the constructivism discipline. Stake (1995); Stake (2003) states that "case study methodology [was] written largely by people who presume that the research should contribute to scientific generalisation" (Stake, 2003: 140) but instead should focus on the researcher's interpretation which "encourages providing readers with good raw material for their own generalising" (Stake, 1995: 102). Merriam and Tisdell (2015: 54/55) state that the "single most defining characteristic of case study research lies in delimiting the object of study: the case". However, Yin (2018) acknowledges that much of the case study research in his book had leanings towards a "realist" perspective. It offered a firm foundation to guide a case study methodology, irrespective of epistemological perspective. Therefore, this study takes on aspects of all three case study viewpoints.

This study's overarching social research component lends itself to the interpretivism chain of thought—the co-creation of theory through qualitative research and

information sharing between the researcher and the participants. Therefore, as this research was concerned with a person-centred project, it was only fitting, in this case, that the POE was very much aligned with social outcomes. To achieve this, the research design would have to rely on a paradigm that could focus on the subjective human impact, leading to the conclusion that this study fundamentally disagrees with the ontology of "realism", part of the positivist paradigm, as "the world is there regardless of whether human beings are conscious of it [… and…] becomes a world of meaning only when meaning-making beings make sense of it" (Crotty, 1998: 10). The researcher's background within architecture might influence this, as it would be challenging to define typologies or state the purpose of designing without meaning being assigned to them. We could assess the quality of the environment against technical or accessibility guidance, but why is this guidance in place, and how was it developed? Without relevance to humans and thus meaning, it simply would not exist. Without being overly pedantic and embroiling this study within the "paradigm wars", the following section focuses on the much safer but often controversial "middle ground" of the philosophical debate.

5.6 Philosophical Underpinnings

5.6.1 A Pragmatist Paradigm

After introducing social sciences into the realm of architecture and exploring case study epistemology, there was still deliberation over the philosophical underpinnings of the research, which will define the study outcomes. POE and, more recently, BPE are two strategies generally viewed as having a positivist perspective. This was evidenced within the previous chapters, defining the building evaluation process as the "process of evaluating buildings in a systematic and rigorous manner" (Preiser, White and Rabinowitz, 2015: 3). This "systematic manner" often places traditional building evaluations with a firm grounding in the positivist or post-positivist perspective of thought—a perspective that focuses on careful observations and measurements of objective reality (Creswell and Plano Clark, 2017). Conversely, as evidenced within the previous chapter, the topics concerning wellbeing could be argued to suit an interpretivist perspective. Gathering in-depth information can

harbour findings related to the specific phenomena being studied. It was clear that a fusion of the two quite different perspectives of thought would be an appropriate balance: on the one hand, focusing on objective truths: and, on the other, telling them through the subjective view of those using the hospice, leading to the conclusion that a pragmatist paradigm might best inform the research design. However, as discussed in the following chapter, the "case" itself influenced the research path.

Choosing a paradigm is essential as it determines "how members of research communities view both the phenomena their particular community studies and the research methods that should be employed to study those phenomena" (Donmoyer, 2008: 591). The pragmatist approach looks toward answering "how" and "what" (Cherryholmes, 1992; Creswell, 2018), aligning with case study research which looks at capturing data from exploratory "how", "what" and "why" questions (Crowe *et al.*, 2011; Flyvbjerg, 2011; Sarvimaki, 2018; Stewart, 2014; Yin, 2018). In addition, mixed methods research is often reported synonymously with the philosophical underpinnings of pragmatism (Creswell and Plano Clark, 2017; Denscombe, 2008; Tashakkori and Teddlie, 2003). The development of pragmatism as a philosophy was articulated through a set of ideas derived from Dewey, James and Sanders Peirce (Creswell and Poth, 2018; McCaslin, 2008; Vannini, 2008) with Mead and Lewis building upon this philosophy (Thayer, 1968). Pragmatism was formally linked to mixed methods research by Tashakkori and Teddlie (2003), who also proposed that the traditional dichotomy between philosophical worldviews should be abandoned in favour of a practical and applied research philosophy. Some scholars have countered this argument by suggesting that rather than viewing mixed methods as a separate paradigm, it is more appropriate to identify the relevant paradigm within mixed methods (Groat and Wang, 2013). According to traditional pragmatists, knowledge can only be comprehended from the perspective of a cultural member and not through an outside objectivist epistemology (Vannini, 2008). A pragmatism interpretation of research does not ascertain if it represents "reality" but is concerned with external implications in the context of its production (Bishop, 2015; Yardley and Bishop, 2008). Within healthcare, these implications might involve improved quality of life for patients with specific conditions or contribute to

future health policies. Therefore, the research should be evaluated according to its contribution to its unique outcomes, with pragmatism's key focus being how best to answer the research question (Bishop, 2015).

Although pragmatism is commonly associated with mixed-methods research, it is not the only paradigm that is compatible with this approach (Hall, 2013). For instance, Goldkuhl (2017) suggests that interpretivism and pragmatism can be combined, either by using interpretivism as an instrument for pragmatist studies, or vice versa. Interpretivism is primarily concerned with understanding and constructing meaning, while pragmatism emphasises action and intervention based on constructed knowledge.

5.6.2 Action Research: Appreciative Inquiry

Pragmatism does not limit itself to providing explanations or understanding, as positivism and interpretivism do. Instead, it offers prescriptive guidelines, reveals values, and suggests possibilities. Goldkuhl (2017) argues that all of these aspects contribute to what he calls constructive knowledge. The key difference with other epistemologies is that pragmatism emphasises the application of knowledge to action. In other words, knowledge gained through pragmatic research should be used to inform practical decision-making and real-world solutions (Dewey, 1931). Although not explicitly stated within Merriam (2009) writings, it could be viewed as aligning with a pragmatic approach (Brown, 2008; Harrison *et al.*, 2017), being classified as a pragmatic constructivist (Harrison *et al.*, 2017). In her view, case study research should be “manageable, rigorous, credible, and applicable” (Harrison *et al.*, 2017: para24).

A review of past studies within the hospice uncovered that the participatory, action research methodology, Appreciative Inquiry (AI), had been used effectively. It is a philosophy that illuminates and enables change and development of the subject under study (Lander and Graham-Pole, 2006; Nicholson and Barnes, 2012). AI focuses on strengths rather than weaknesses, which can often be successfully used within change management processes. It contrasts with many other approaches to evaluation, focusing on what is currently being done well and what resources are

required to build on this rather than focusing on deficits and problems (Kelly, 2010). Nicholson and Barnes (2012: 64) argue that "appreciative inquiry is useful in helping specialist palliative care move beyond the often privileged and powerful positioning of some as "experts" and others as "recipients of knowledge/care", to a place where we are all co-learners and contributors". It consists of a five-step (5-d) methodology:

- "Define: establish a conceptual and contextual frame, using an unconditional positive question;
- Discover: value the best of what is;
- Dream: envision what might be;
- Design: dialogue what should be;
- Destiny: innovate what will be."

(Lander and Graham-Pole, 2006: 3)

Ai was employed in a report by Wylie (2016) entitled "Findings from an Appreciative Inquiry Conducted on Behalf of The Prince And Princess of Wales Hospice". It consisted of a series of workshops to provide an opportunity for staff to discuss and reflect on the positive care already being delivered and, at the same time, explore aspects that contribute to this high-quality care to capture this to enhance the care experience for all. This report inspired this study to gather a greater understanding of the organisational culture and aspects related to the successful implementation of the building project, which will be discussed in the next section of this chapter. The literature on building evaluations from the previous chapter highlights the stark differences between methodologies. AI provides an opportunity to bridge the language gap between healthcare and design research by utilising commonplace techniques within healthcare research (Groeneveld *et al.*, 2019). However, not implementing this AI approach directly, as the research attempted to gather a more balanced view that could highlight barriers or issues faced to help future projects. However, it uses some methods and positive language within AI.

5.6.3 Constructivist Pragmatism

We have now determined why a pragmatism perspective has been decided

concerning the research, and now it is time to provide evidence for the fusion with constructivism. At first, it might appear counter-productive to fuse the philosophies of pragmatism and constructivism, as it could defy the entire underpinnings of the pragmatism perspective. However, this study focuses on the PPWH, whose attitude throughout the design project and even their organisation's successes thrive on what appears to be a constructivist philosophy. It seemed somehow detached not to continue the journey of this study with constructivist leanings. It made sense to focus the data collection and dissemination of research within the constructivist perspective as this study wants to fully situate itself within the organisation and look at co-creating meaning within the research. A constructivist perspective would view an organisation as "a field of conversation. Whenever people are conversing, they are co-constructing meaning" (Gergen, 2009: 145). In some organisations, the views of management may not fully reflect the realities and values of the average worker. Therefore, decisions imposed on this group are from the "outside". However, incorporating views from everyone within an organisation can increase their investment. As such, an organisation should facilitate conversations with as many people as possible that enable the "sharing of vision, values, and insights" (Gergen, 2009: 149), as "without people coming together and determining what they are doing and why it is important, there is no organisation […and…] unless its participants coordinate their actions around a set of specific goals, the organisation will fail" (Gergen, 2009: 144). The traditional vision of successful leaders may be one of "command and control" (Gergen, 2009: 149). However, the success of leaders now can be down to "collaboration, empowerment, dialogue, horizontal decision making, sharing, distribution, networking, continuous learning, and connectivity" (Gergen, 2009: 149). The philosophy underpinning the PPWH organisation is that of social constructivism, invested in the belief that "together we construct our worlds" (Gergen, 2009: 3). Social constructivism developed from the phenomenological tradition "and still entertains important exchanges with constructivists concepts" (Kersten Reich, S. Neubert and Hickman, 2009: 55). This constructivist attitude focuses on understanding and in-depth exploration of the human perspective on the project instead of solely quantitative data. This study was designed to reflect this journey as closely as possible, looking toward understanding the stakeholders instead

of academia.

Parallels can also be drawn between the design process (Cuff, 1992), with the design process following a similar path utilised within their PPWH organisation, extensively involving key stakeholders within the design of the building. These ideas were compounded by Cuff (1992: 13), who states that "the design of our built environment emerges from collective action", particularly in the design process. It counters the common belief that design is the creative endeavour of an individual by "considering architecture as a social construction creative within the culture of practice" (Cuff, 1992: 56). This was further echoed by Sylvest (2018: 155) that "humans are an integral part of the socio-physical environment, engaging simultaneously with different physical settings and other humans that co-inhabit these settings. This co-inhabitation means that the natural human situation is inherently a social one. Social constructivists place themselves within their research, developing close relationships with participants and gaining in-depth insight. They utilise open-ended questions and emergent analysis, thus providing a voice for marginalised groups through advocacy/participatory research (Butler-Kisber, 2018). The research heavily relates to Crotty (1998: 42) view on constructionism as "all knowledge, and therefore all meaningful reality as such, it's contingent upon human practices, being constructed in and out of interactions between human beings and their world and developed and transmitted within an essentially social context". In summary, meaning ceases to exist without the existence of humans to discover and interact with it. Taking inspiration from the NHS approach to patient involvement in decisions, this study takes a "no decision about me, without me" (Department of Health, 2012) approach within the research design. This means involving the staff as much as possible and learning from them, being guided, in effect, by the organisational culture and their visions and what was important to them. The philosophical underpinnings of the study were heavily influenced by the person-centred approach in the design of the PPWH. This study explores areas that have been potentially inaccessible by the positivist epistemologies commonly utilised within POE studies.

This study was influenced by the qualitative approaches of ethnography,

phenomenology, case study, grounded research and action research, which according to Butler-Kisber (2018), fall under the same thematic perspective and use a categorising analytical approach. This helped cement the use of thematic analysis to interpret and present the findings, as detailed in the following chapter. Furthermore, the phenomenological tradition has informed interviewing within the qualitative inquiry, focusing on drawing out the participants' stories and experiences (Butler-Kisber, 2018).

5.7 Influencing Theory (A Theoretical Framework)

Having an established theory to which new research relates ensures it follows a similar protocol and can mean new findings might contribute to the development of the theory itself (Robson and McCartan, 2016). However, time constraints may limit how in-depth the literature is collated and reviewed, as "[t]he topic may be novel and appropriate theories elusive" (Robson and McCartan, 2016: 62). Although beneficial, Robson and McCartan (2016) suggest that working with formal theories and concepts was not essential for real-world research. There can be two distinct relationships between research and theory: "theory verification" and "theory generation". The first most notably aligns with the positivist perspective, which starts with a theory that informs hypotheses with the study designed to test these. The latter can be found within the interpretivist perspective, starting with the absence of theory and developing a theory from the systematic analysis of the collected data. They conclude that the research should have a theory no matter the research design. Basically, an informed understanding has been conceived about the topic in question "that theory about what is going on, what is happening and why, particularly when expressed in diagrammatic form, is sometimes referred to as a conceptual framework" (Robson and McCartan, 2016: 63). Robson and McCartan (2016) suggest that novel researchers might find it helpful to develop this diagram, refining it through discussion and, in the case of flexible design approaches, throughout the data collection and analysis. Replicating the previous study or building in relation to the current study can also help strengthen the reliability of findings.

It can be challenging to design a theoretical framework in a qualitative study as it “is designed to inductively build rather than to test concepts, hypotheses, and theories” (Merriam, 2009: 64). Therefore, some believe it has no place at all. Merriam (2009: 66) believes that “a theoretical framework is the underlying structure, the scaffolding or frame of your study”. No study could exist without questions. How it is phrased and situated in relation to the problem statements develops a theoretical orientation.

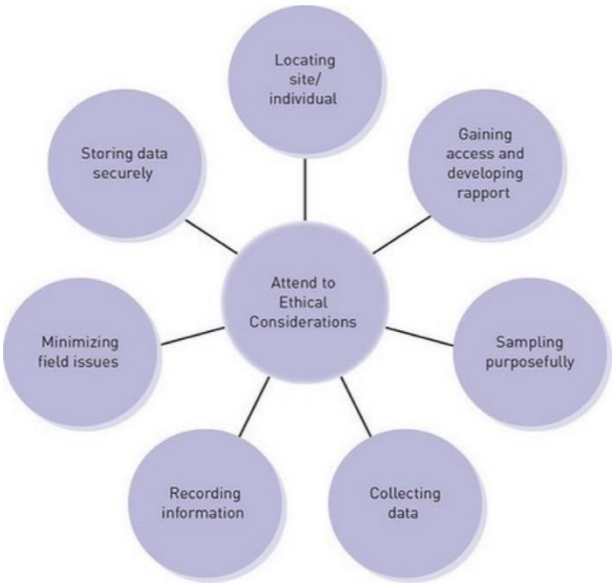
5.8 Conclusion

In this chapter, the methodology that complements the theoretical and conceptual frameworks in the previous chapters were justified. It explained the involvement and importance of key stakeholders in the evolution of the study, which influenced the research's direction and primary aims. The reasoning behind using a mixed methods case study methodology was presented, informed by the review of the paradigm wars and philosophical perspectives relevant to this study. The chapter compared the typical positivist orientation used in building evaluation studies with the pragmatic constructivist orientation used in this study and discussed the implications of this choice for the methodology. Finally, the chapter explored the benefits of interdisciplinary collaboration across architecture and healthcare research fields and how this collaboration can be achieved. The next chapter will provide details on the research design and data collection procedures.

Chapter 6
Research Design

The research design engaged in the Creswell (2018) data collection circle; seven interrelated activities with ethics at the centre ensuring effective measures were followed (see Figure 6-1). One of the most time-consuming and rigorous aspects of data collection was the ethical considerations. Its importance was recognised by Creswell (2018); “by placing ethics at the intersection of the data collection circle, we emphasise the need to attend to ethical considerations across the phases” (Creswell, 2018: 213). This chapter, therefore, explores these data collection considerations and how they were applied to this study.

Figure 6-1 Creswell (2018) data collection circle.



6.1 Ethics

Ethics was an integral aspect of the study's data collection phase, with the researcher considering and addressing an exhaustive list of anticipated and emergent ethical issues. There are three guiding principles for ethical research: respect for persons (i.e., consent and confidentiality; concern for welfare (i.e., to minimise harm); and justice (i.e., inclusion and equitable treatment) (Creswell, 2018). Seeking and obtaining permissions from institutional review boards must be conducted before data collection (Creswell, 2018; Sieber and Tolich, 2013). Gaining this approval ensures the study design complies with strict protocols for conducting research (Creswell, 2018). As data acquired before ethical approval cannot be used within the study, and approvals can take weeks to months (Sarvimaki, 2018), the process must be started as early as possible.

Although ethical principles are identical within quantitative and qualitative research, the ethical considerations can be sufficiently distant and warrant separate procedures (Sieber and Tolich, 2013). Quantitative methods, for example, may take the form of an anonymous questionnaire where consent is implied when the completed questionnaire is returned. On the other hand, qualitative research allows for an in-depth description and documentation of people's experiences and lives, typically involving direct interaction with participants. Consequently, it comes with extensive ethical considerations, often requiring a signed consent form and ongoing consent (Brinkmann and Kvale, 2008; Sieber and Tolich, 2013). Patients and families have a right to participate in research that could influence future projects. Being classed as vulnerable participants, it was essential to identify and address ethical concerns to protect from harm (University of Strathclyde, 2013).

6.1.1 Ethics and the Architectural Profession

Suppose there is a shift from BPEs being undertaken by academics and researchers to those within the architectural profession. In that case, rigorous ethical principles must still apply, especially as people can often become subjects or participants in the investigation (Sharpe, 2018b). Studies undertaken through academic organisations require ethical protocols for research involving human subjects, and some other

organisations might not have such rigorous ethical policies or procedures. Architectural professionals will apply their level of due diligence as per the Architect's Registration Board's (ARB, 2017) “The Architect's Code: Standards of Professional Conduct and Practice” and the Royal Institute Of British Architects’ (RIBA, 2019) “Code Of Professional Conduct”. However, both are lacking in terms of the definition of “ethical practice”. If deemed as a national or major development, a building project must have a pre-application consultation (PAC) report submitted to comply with the Town And Country Planning (Scotland) Regulations 2013 and The Planning Etc. (Scotland) Act 2006. For the applicant (typically the architects), it is a requirement to organise at least one open public consultation event as part of the planning application process. Applicants receive and document comments on their proposals as part of a report to be submitted to the planning department. However, this “due diligence” might not cover complex ethical revelations, especially when working with vulnerable populations in healthcare or schools. The Architects Registration Board (ARB) provides professional conduct guidelines for post-evaluation of buildings, but there are no specific ethical policies beyond these guidelines. To address this gap, it has been suggested that ethical considerations within BPE studies could be informed by academic protocols and policies. This might include considerations such as non-maleficence, research conduct that emphasises honesty and integrity, avoiding coercion, obtaining informed consent (including the right to withdraw), maintaining confidentiality, promoting equality and diversity, and ensuring data protection (Sharpe, 2018a). In NHS healthcare environments, if the research is part of routine monitoring and service improvement, it could be considered under the definition of service evaluation, therefore not requiring rigorous ethics applied. However, as emphasised by Stake, ethical research standards should be maintained: “qualitative researchers are guests in the private spaces of the world. Their manners should be good and their code of ethics strict” (Stake, 2003: 154).

6.1.2 Informed Consent

Informed consent is an important consideration when dealing with participants: informed means that participants know what the study involves and what is being

asked; consent means participants have explicitly agreed to take part. Informed consent can be an ongoing process, especially within qualitative research, involving communication between the researcher and the participant. Process consent involves the researcher ensuring participants still wish to consent during and after the data collection. A consent form should provide study details in simple, everyday language, omitting superfluous details and jargon. For consent within questionnaires, a brief consent statement and the return of completed questionnaires imply informed consent, with failure to return a refusal to participate (Sieber and Tolich, 2013). Within this study, the questionnaire consent statement is “submitting the completed questionnaire means that you are happy to take part in the research” (Appendix 2). Concerning interviews, the consent statement is a one-page document, with each point having to be agreed upon with the participant's signature and date at the bottom.

One instance of a challenging ethical issue occurred during an interview in the Pilot Study of the existing building. Due to participant convenience and potential oversight by the researcher, one interview was conducted within the space primarily used by that staff member. It happened that another member of staff was in the room tending to their own work. However, in some instances, the other staff member gave their view on the environment or added additional information to the participants' responses. As they had not been aware of the study or been involved in the informed consent process, the researcher asked if they could send out the participant information sheet (PIS), Appendix 3, and consent form to consider their statement being included in the study. They verbally agreed to receive this information after writing the transcripts and emailing them to the participant and the other staff member after the move. However, this staff member decided that their views did not fully represent the new facility after being in the space and experiencing it. Therefore, they did not want their data to be included in the study. As such, the researcher omitted any statement by this person from the transcripts. This left some confusion as some omitted statements were intertwined with the participant involved. In hindsight, having another colleague in the room may have deterred the participant from feeling comfortable sharing what they might have if they had been on their

own. However, as this was in the pilot stage of the study, with the results not being included as part of this thesis, it did not have significant implications for the findings. Instead, it added to the researcher's knowledge and experience of interviewing.

6.1.3 Confidentiality

Confidentiality forms part of the informed consent agreement and is “about data and refers to agreements with persons about what may be done with their data” (Sieber and Tolich, 2013: 155)—primarily concerned with protecting the anonymity of participants. This was straightforward within surveys where characteristics are anonymised, and data reported as averages of all respondents. However, in qualitative interviews, participants' statements may be publicly published, and measures must be taken to protect anonymity (Brinkmann and Kvale, 2008). Qualitative research aims to document detailed personal views and circumstances, but the risk of exposure for participants could lead to “embarrassment, as well as loss of standing, employment, and self-esteem” (Stake, 2003: 154). Sieber and Tolich (2013) further state the researcher can be held responsible for any harm, potentially leading to subjects suing. The researcher should always identify risks and put in place precautions to manage these. Measures to protect confidentiality must be considered within studies, and specific terms should be detailed within consent forms (Sieber and Tolich, 2013). It is good practice for the researcher to provide participants with drafts of how they might be portrayed, quoted or interpreted (Stake, 2003). An essential aspect of documenting people's views and accounts is the “member checking” process. This is when drafts are sent to the people involved in the study to review for accuracy and gather feedback for amendments (Stake, 1995). This was anticipated by the researcher within this study and written into the protocol and PIS that a draft transcript would be provided to participants for comments, amendments or omissions. In this study, some participants were concerned they might be identified through their quotations. The researcher acknowledged that when deciding on quotations to include, there was potential to identify participants due to some having unique specialisations within their work. The researcher made sure that any comment that could potentially identify a participant did not contain anything harmful to the participants. Stake (2003) states that one stylistic consideration of case

study research was deciding how much to anonymise. This “stylistic” consideration became a potential ethical concern for protecting participant anonymity. Therefore, the decision was not to provide aliases allowing cross-referencing of quotations, so comments could not be traced back by a single identifying quotation. The only delineation between quotations was categorised into staff, patients or families/friends.

Another data collection method within this study was to photograph the site. However, “photographs complicate human research as they automatically breach confidentiality: the image makes persons recognisable” (Sieber and Tolich, 2013: 79). As such, consideration was given to this within the ethics application, and the researcher would take photographs containing no human subjects and, therefore, would not breach confidentiality or informed consent.

6.1.4 Other Ethical Considerations

Much of the literature on sensitive research focuses on protecting participants, on ethical requirements and strategies to mitigate distress, and rightly so. However, less attention is given to the researcher, who could experience personally distressing situations, especially with doctoral students and novice researchers. Some suggestions for dealing with these situations are developing self-care strategies, engaging in journal writing, having social support networks that can contribute to processing feelings, reducing avoidance, and increasing awareness and preparedness (Kumar and Cavallaro, 2018; Rager, 2005). Immersing oneself in a healthcare environment and the lives of vulnerable people requires consideration of the sensitivity of the context, not only concerning the vulnerability of participants but also ensuring self-protection. Preparation can be made to make participants feel comfortable; however, unexpected situations might arise that could be emotionally charged or delicate, and such events should be considered (Groeneveld *et al.*, 2019). To that end, one ethical consideration of this study identified and addressed the concern of researcher protection.

Medical research is typically associated with physical harm or risk to participants, and as a result, it often requires rigorous ethical safeguards to ensure the safety and

well-being of participants. In contrast, some people argue that “soft” research, such as ethnography, is relatively harmless and requires less ethical scrutiny. However, this view is controversial, as all research can potentially impact participants in significant ways, even if not physically. There are serious ethical considerations when researching within the field of palliative care (de Raeve, 1994; Duke and Bennett, 2010; Parkes, 1995), but this should not deter researchers from including patients or families in research. However, conversations may lead to emotional memories. In research by Payne *et al.* (2007: 239), bereaved people found “the opportunity to reflect upon and discuss their experiences in the context of interviews as sometimes painful but also helpful”. If a participant becomes distressed during an interview, “expressing grief can be a very therapeutic experience, and the interviewer need not attempt to block or inhibit such spontaneous expressions” (Parkes, 1995: 175). However, the participant should take priority over the research needs with the decision to pause or end the interview dependent on the participant's wishes, which in some cases can be determined by the support the interviewer gives. If the person needs help, the interviewer should not hesitate to provide it, as there is no place for scientific detachment within these scenarios. The interviewer should also make themselves aware of any additional sources of support that can be used (Parkes, 1995). Within qualitative research, the researcher could be seen as taking the role of a therapist for participants feeling lonely or worried (de Raeve, 1994). Although this is much more likely within observational methods, it could still apply to interviews, with the researcher offering a neutral space for the participants to share views, stories or experiences. Consideration was given to these situations, with the researcher seeking training on communication with upset participants and having a point of contact at the hospice if they required further support. Consideration of the ethical implications the researcher might face when interviewing patients or families became a priority. Occasionally participants got upset remembering their experience within the building. Some recounted their experience with a family member or patient; some of these deeply resonated and stimulated other moments of emotion. It was harder to console someone or sense their emotional state virtually. Providing a form of peer debriefing and support from the research group allowed the discussions on these experiences, reliving the intensity and aiding in personal reflection. There was one

online interview where the researcher was met with strong emotions from a participant; in line with Parkes (1995), the interviewer provided time and space for the participants to express their feelings, with the opportunity to end or postpone the interview if required.

Participants may feel more anonymous during online methods of correspondence, which in interview situations could lead to over-disclosure of information (Sieber and Tolich, 2013). This also featured within focus groups and revealed over-disclosure as a limitation (Morgan, 1998). Regarding research ethics, face-to-face data collection could be considered "the gold standard" (Sieber and Tolich, 2013: 122). As such, safeguards should be implemented within other methods to maintain ethical integrity (Sieber and Tolich, 2013). These ethical concerns were addressed within this study's ethical considerations in the project protocol in Appendix 1.

6.1.5 Gaining UEC Approval/Limitations

As this was a study involving a vulnerable population, it included a detailed and lengthy application process (Creswell, 2018). In the first instance, research involving those who "are severely ill or have a terminal illness" (University of Strathclyde, 2013: 12) required approval from the University Ethics Committee (UEC) rather than the Departmental Ethics Committee (DEC). Under section "4.1.2. Protection of vulnerable groups", the University of Strathclyde (2013) suggest that in some cases, the researcher must be a member of the Protecting Vulnerable Group's Scheme (PVG scheme) involving an application for a "disclosure" document containing information related to criminal history. Although not explicitly required for the UEC application, it was requested by the PPWH organisation that the researcher went through this process, one through which they put all their staff and volunteers through to protect the people they care for.

Following the development of evaluation tools for the environment, there was insufficient time to collect data during the Pilot Study conducted in the existing building, which was further delayed by the ethics process. The researchers investigated the ethical implications and determined that the Pilot Study could be classified as a service evaluation in line with NHS guidelines if interviews with

patients and family members were excluded. However, as the study was still being conducted in a vulnerable population, the research team consulted with experts in the palliative care field and PPWH management, who recommended that the project be submitted to the UEC for review. Coming from an architectural background, there was little experience with ethical applications throughout university. Therefore, substantial research was required to effectively identify and address all ethical considerations this study raises. After discussion with the Research & Knowledge Exchange Services (RKES), the UEC application and the relevant documents (PIS, consent forms etc.) were submitted. Once the initial UEC comments were received, further advice was sought from various researchers and professionals in the palliative care field. The experience of submitting to the UEC provided a thorough grounding in the procedural methods of recruitment and consent: "Although it is not the job of the ethics committee to teach science, it should protect the public from sloppy methodology" (Parkes, 1995: 177). However, due to inexperience, there were instances of over-caution with ethical considerations, such as using PIS and consent forms for anonymous questionnaires in the Pilot Study. After discussion with other academics at the university, a revision was requested before approval to exclude these steps. However, the UEC Manager advised that it formed part of the procedures and was the correct way to gain informed consent. This impacted the response rate, with much information for the participant to read before completing the questionnaires. This consent method was reconsidered for the NHS ethics application and amended to include a short statement on questionnaires. During the research, requests were made to the UEC for amendments to include data collection involving focus groups and management interviews, as detailed in Table 6-1. After review by the UEC, this was approved relatively quickly. In hindsight, taking the project through ethics benefited the researcher; it helped validate the overall project, ensuring the correct procedures and protocols were followed according to the university policy. This ensured that when the project in the new building was taken through ethics and not deemed a service evaluation, the researcher had more knowledge and skills in this area.

Table 6-1 University ethics approval process

Action	Date
Flagged by PPWH as a requirement	21st February 2018
Supervisor made contacted UEC	12th June 2018
UEC meeting held	05th July 2018
Response from UEC with required clarification and amendments	18th July 2018
Submission of amendments (withdrawn after discissions)	04th September 2018
Submission of amendments	12th September 2018
Response from UEC with required further clarification and amendments	17th September 2018
Submission of amendments	18th September 2018
Approval received	19th September 2018
Amendments requested to include focus groups and management interviews	28th April 2019
Approval received	01st May 2019

6.1.6 Gaining NHS Ethics Approval

Ethical considerations should not only apply to the patients but also to the family members, some of whom may be bereaved. Parkes (1995) offered a criterion for preventing possible harm to bereaved participants, which can apply to all family members; these include:

- Research results not being conducted to obtain personal gain;
- Not pressuring participants to take part and them being informed of their right to withdraw at any point;
- The interviewer having training in support of bereaved persons, being able to identify if someone is distressed, allowing them space to express their emotions and offering to pause or end the interview;
- Having supervision from somebody with sound knowledge of bereavement and counselling as well as a good understanding of the research study;

- Ensuring confidentiality is adequately upheld;
- Minimising patient distress during the interview, which in turn allows the collection of accurate data; and
- Employing a rigorous study methodology.

As the study involved interactions with patients and did not fall under the definition of a service evaluation or audit, it was required to go through the NHS ethics application process (HRA, 2017). First, determining if the research within the new building would fall into the "service evaluation" category was an essential and lengthy process. After gaining advice from the PPWH research group, it was decided that the research could fall into either category depending on how the protocol was written. The HRA (2017: 5) report defines research as "the attempt to derive generalisable or transferable… new… knowledge to answer or refine relevant questions with scientifically sound methods". The framework also covers "noninterventional health and social care research", aiming to produce hypotheses, as well as methodological and descriptive research. As an aspect of "new knowledge" was being generated about the Sengetun care model, it was hoped that this could provide evidence for its adaption within other healthcare projects and, therefore, would push the study's definition into what the NHS framework would classify as "research". The PPWH research group suggested that some studies without the proper ethical approval could be challenging to publish. The HRA (2017) recognises that the generalisability or transferability of research may only become apparent after project completion. This was something that might prove true of this study due to the abductive method within the analysis. As a result, something that was previously classified as a service evaluation could later be deemed as research, and without the proper ethical approval, the study might become unpublishable. Due to time constraints, NHS ethical approval could not be sought for the study in the existing building. Therefore, patient and family interviews were excluded. Only anonymous questionnaires were completed by patients and families, who would be recruited by staff under the guidance of the research protocol and researchers' advice. The data collection phase in the existing building was explicitly designed for any patient/family involvement to be collected under a service evaluation.

PPWH research group lead provided the contact for the Manager and Scientific Officer of the West Of Scotland Research Ethics Service - the board who would be vetting the application. They advised that all quantitative research methods, including those involving patients, would not require NHS approvals if no direct interaction were had with patients. Nevertheless, qualitative methods like patient interviews may require ethical review. It was decided that it would be beneficial to have NHS approval due to the favourability of publication. The process of applying for NHS ethics is documented in Table 6-2. Completing the Integrated Research Application System (IRAS) application and amended documents from the previous UEC application took four months from start to submission (13th December 2018 to 12th April 2019). When submitted, it took less than a month to get the NHS Research Ethics Committee (REC) meeting date (03rd May 2019) and less than a week to get the decision (08th May 2019). Additional consideration was given to the last data collection phase, refining and expanding the research documents to comply with IRAS reporting standards. As the terminology within the IRAS application was tailored toward clinical research, there was a substantial amount of time reviewing the IRAS help guides to ensure the form was completed accurately. After submission, the REC Manager and Scientific Officer got in touch to discuss if the submission was suitable for REC review regarding the HRA (2017: 5) stating that "activities that are not research according to this definition should not be presented as research and need not be conducted or managed in accordance with this framework". It was agreed that certain parts of the application were expanded to clarify that it fell under their definition of research. For example, Section a57 of the form asks, "what is the primary outcome measure for the study?" was answered concerning research outcomes. However, the REC manager stated it referred to patient outcomes. Therefore, it was amended to relate to healthcare and patient outcomes, explicitly providing evidence for designing future person-centred care facilities. The application stated that the Chief Investigator (CI) could be a student in a "doctoral-level study while employed by a health or social care provider or a university" (HRA, 2017: 15). Therefore, the CI was named the doctoral student on the IRAS application. However, an amendment was requested for the CI to be a Supervisor unless the student had prior demonstrable experience within the healthcare field

(HRA, 2017).

Table 6-2 NHS ethics approval process

Action	Date
Registered with IRAS	13th December 2018
Submitted application	12th April 2019
Response from REC with required clarification and amendments	15th April 2019
Invitation email to attend REC meeting	26th April 2019
Date of REC meeting	03rd May 2019
Approval received	08th May 2019
Start of covid amendments & update to REC on one-year application progress	24th June 2020
Submitted covid amends	17th August 2020
Response from REC with requested clarification and amendments	18th August 2020
Submission of amendments	02nd September 2020
Letter acknowledgement for review	09th September 2020
Email request for amendments and approval letter received	10th September 2020

The researchers and PPWH hospice representative attended the REC meeting on 03rd May 2019, where they answered questions related to the research, including questions about (1) the sample size; (2) the potential for bias due to the host organisation being involved in recruitment; and (3) how the research would be disseminated. Ethical approval was given on 08th May 2019 (REC reference: 19/ws/0065). IRAS project id: 259357. Subsequent changes were sought for the original approval due to the emergence of covid-19 at the final stages of fieldwork. Amendments had to be submitted to the NHS REC to continue fieldwork during the lockdown, but these amendments only impacted the interviews and photography documentation, with details of these included in the next chapter on research methods.

6.2 The Site and the Participants

The case study of the PPWH already dictated the site, and the individuals participating were the patients, family, friends, staff, and volunteers. However, a concern raised by the NHS REC was that there might be bias due to the host institution's involvement in recruiting participants. This was problematic as the best access to participants was through staff within the organisation. The researcher attempted to mitigate this perceived bias by putting the recruitment poster on social media and in the posted newsletter to ensure everyone would have an equal opportunity to participate.

6.2.1 The Outsider/Insider Debate

Researchers often become part of the social group they intend to study, with this integration standard within qualitative studies. Consequently, healthcare research is often conducted by those with a related background (Bonner and Tolhurst, 2002; Walshe, Ewing and Griffiths, 2012). These researchers are often from a clinical background, such as nursing, and are classified as an “insider”. Conversely, those from an entirely different background and strangers to that field setting are classified as an “outsider”. Both have advantages and disadvantages. Being an “insider” can facilitate acceptance into the group under study and enhance cooperation. However, the researcher may also be biased or have a conflict of interest with their job role. On the other hand, being considered an “outsider” can facilitate taking an impartial observation role, free of commitment from the group. However, more time might be required to establish trust, or unexpected research delays may arise due to “culture shock” (Bonner and Tolhurst, 2002). From an architectural background, the researcher would technically be considered an “outsider” in this healthcare setting. An “outsider” was chosen to work collaboratively with the hospice organisation to produce novel insight into the design of healthcare facilities, not purely from a clinical standpoint but one that spans the disciplines.

An interesting finding by Groeneveld *et al.* (2019: 318) sets the scene for the stark differences within the fields of healthcare and design research, with “health [research] following structure and strict protocols, and design [research] processes

based on flexibility, ambiguity, and creativity". Interestingly the PPWH had a middle ground between the two, perhaps down to active engagement with the building project and architectural process for over eight years or their palliative care expertise, with a natural affinity for being receptive to alternative holistic care for wellbeing rather than treatment for illness. The PPWH research group demonstrated the combined impact of the two research styles. On one hand, there were those involved in clinical research, which was described in terms of procedures and protocols aimed at developing new treatments. On the other hand, there were those involved in alternative therapies, such as the art project, who explained their work in terms of philosophy and concepts, aiming to develop flexible frameworks.

Non-clinical researchers can experience many unexpected challenges and restrictions during fieldwork. Even with prior preparations, they can still have a feeling of being lost. This can include complying with strict protocols of controlled environments and managing relationships with clinical staff. This can be further complicated by design researchers and clinicians having different communication "languages", importantly, often having different terminologies. The success of research is ultimately down to creating understanding between both parties, ensuring everyone is on the same page (Groeneveld *et al.*, 2019). Identifying and addressing these challenges from the outset was achieved by the researcher maintaining a continuous dialogue with the hospice organisation, thus bridging the gap between architecture and healthcare to mitigate misunderstandings in communication. One method the researcher used to familiarise themselves with the hospice was informal observation and having a presence within the building.

To overcome the challenges of being an "outsider" in a healthcare environment, researchers should undergo the necessary training and gain practical experience, such as working within multidisciplinary teams or broadening their knowledge of various social research methods. This can help them better understand the healthcare environment and its complexities and enable them to identify the strengths and weaknesses of different data collection and analysis techniques.

One of the most important aspects of collecting data from multiple sources is the

training and expertise of the researcher. If the researcher inadequately implements the various research methods, the opportunity to establish converging lines of enquiry can fail (Yin, 2018). From an architectural background, this researcher came to the study with an unbiased perspective. Although experiencing some disadvantages, the consultation process conducted at the beginning of the study and documented in the fieldwork diary containing notes from informal meetings, discussions and observation strengthened an understanding of palliative care. It allowed trusting relationships to be established with staff, albeit not explicitly detailed due to the unscientific nature of data collection; they were no less critical to the formation of the thesis. Any of these informal encounters or experiences that shaped the thesis were included for reference to justify or introduce the reasoning for a particular strand of research and build an understanding of the hospice environments and how the research has been conducted. Groeneveld *et al.* (2019: 322) concluded that "as healthcare is moving from a disease-oriented model towards care that aims to support and empower patients in various ways, exciting opportunities are emerging for design to contribute to the wellbeing and positive experience of both care recipients and care providers". This statement was valid of all non-clinical research currently being conducted within the hospice, with a view of accommodating similar research. However, many proposals lack that sense of "structure and strict protocols" that come with health research (Groeneveld *et al.*, 2019: 318). This study, particularly this chapter, proves a non-clinically orientated research project can achieve the required standards of healthcare research, even if the process took much longer due to inexperience.

6.2.2 Access and Rapport

Identifying leaders or gatekeepers within a community can help access a target population (Creswell, 2018; Sieber and Tolich, 2013). The primary concern of gatekeepers is the health and welfare of their community involved in the research, with them being the ultimate decider in allowing or not allowing researchers access to the setting. They would consider supporting recruitment if the research outcomes benefited their community (Joseph, Keller and Ainsworth, 2016). Researchers can work collaboratively with gatekeepers to achieve a shared goal, especially when

results benefit the researched community (Sieber and Tolich, 2013). An organisation supervisor was assigned, the director of clinical services, who was a crucial support throughout the project, providing the researcher with an advanced understanding of the organisation and contact points in the field. This ultimately led to being invited to the organisation's research group meetings, with the researcher gaining insight into other research projects, including clinical research. As architectural and clinical research fields have many differences (Groeneveld *et al.*, 2019), access to this group was invaluable for seeking and receiving support, especially when seeking NHS ethical approval.

The researcher needs to maintain open communication with subjects and gatekeepers, especially in field research involving many visits to the site (Sieber and Tolich, 2013). In organisational settings, the researcher should provide all interested parties with a layperson's term statement about the research and provide updates on progress. In addition, the researcher should clear any project related public communications through the gatekeeper. This will ensure that good relationships can be maintained throughout the research project (Sieber and Tolich, 2013). In addition to the researcher's role, effective and successful collaborative projects require organisations to be open to research participation and establish early relationships, allowing “strong buy-in” from staff and identifying champions to act as liaisons (Skovdahl and Dewing, 2017: 92).

Another critical part of any study is developing a rapport and gaining participants’ confidence (Archibald and Munce, 2015; Creswell, 2018). Building trust and confidence and co-creating meaning was an essential element of the study by Skovdahl and Dewing (2017) with staff reporting that their role as nurses made participants feel understood and that they were interested in them as people, as well as the development of the services, rather than just collecting data. Participants reported that contributing to the research gave them a sense of purpose and usefulness, highlighting the importance of including people who access healthcare services not just as “participants” within the research but establishing rapport and co-creating meaning together (Skovdahl and Dewing, 2017).

There was no evidence of “gatekeeping” that might be found within a typical healthcare environment. Although the PPWH ensured all the correct protocols were followed and procedures in place, the researcher was allowed to get deeply involved with the organisations with access to different staff members. The PPWH even provided a “supervisor”, a point of contact for the researcher. This seemed to come from a genuine attitude that this research would highlight the services' benefits and help break down barriers. Within the research group, it was clear that the PPWH were keen to get involved with non-clinical research due to its benefits to the patients. However, protocol and processes of non-clinical research within a clinical environment, especially involving NHS patients, were often unreported or unclear in existing literature.

6.3 Sampling

6.3.1 Sampling Strategy and Size

Unlike quantitative research, qualitative research would not necessarily include large sample sizes or employ random sampling techniques. Qualitative research studies purposely select participants to help understand and answer the research questions (Creswell and Creswell, 2018; Creswell and Poth, 2018). Therefore, there is no predetermined sample size due to the iterative relationship between sampling and data analysis (Archibald and Munce, 2015; Tuckett, 2004). With this said, existing literature can guide this decision for the chosen research design by detailing their various sampling strategies. For example, narrative studies can include one or two individuals; phenomenology studies can include between three–ten; grounded theory between 20–30; ethnography examines one single group through various methods such as interviews and observations; (Creswell and Creswell, 2018; Creswell and Poth, 2018) and case studies can range from one up to four or five cases (Creswell and Creswell, 2018; Creswell and Poth, 2018; Yin, 2018). Rather than a predetermined sample, data saturation can be used; a frequent approach utilised in grounded theory. This is where data collection is stopped after reaching saturation within the categories or themes, and no new data is discovered (Charmaz, 2006; Creswell and Creswell, 2018). Even though data saturation was relevant to how often

something was mentioned, the intention behind qualitative data was not to quantify but instead focus on “the richness of the data, not the total counts but the detailed descriptions” (Carey, 2016: 490). Conducting interviews is taxing for inexperienced researchers, especially in studies requiring extensive interviewing, such as case study research (Creswell, 2018). This was a concern raised by the NHS REC due to the large amount of data this would generate for analysis (Appendix 4). However, the researcher assured them they had an adequate strategy and time frame for the data collection, transcription, and analysis, developed from the Pilot Study and expected to span 3-4 months.

This research design was a case study that focuses on one case but was embedded, meaning that it includes different lines of inquiry related to the case. Different sample sizes were predetermined for each data collection method. These sample sizes were estimated before the study due to ethical application requirements. However, the final sample size was determined by data saturation, where no new data was discovered. The Pilot Study identified a reduction in the interview sample size, as no new themes or discussion threads emerged. In this research, purposeful sampling was considered the most appropriate method. However, the researcher also employed elements of opportunistic sampling and snowball sampling throughout the study (Creswell and Poth, 2018). Opportunistic sampling was used only during the pilot Phase to allow the researcher to pursue new leads and identify additional interviewees. Snowball sampling was employed when recruiting patient and family participants, where the staff member interviewed was asked to circulate the recruitment poster to all eligible individuals on their caseload. This focused sampling aimed to obtain data from the key stakeholders that used and had experience in the different areas within the building.

6.3.2 Recruitment of Sample

An essential part of a research project is participant recruitment: “no matter how creative, innovative, or potentially science-altering a research project may be, if researchers are unable to recruit participants into the study, the study is destined to fail and its potential impact on the field of science is lost” (Joseph, Keller and

Ainsworth, 2016: 81). The influence of the informal "supervisor" at the PPWH was one of the driving forces in helping with participant recruitment and providing access to the organisation. The staff recruitment process was reasonably straightforward but became more complex for patients and families. There was a lack of literature, even within textbooks, on the recruitment process for qualitative research, meaning that novice researchers may fail to identify and address the challenges (Archibald and Munce, 2015). Therefore, recruitment challenges had not been anticipated before the commencement of the Pilot Study. One of the most crucial aspects of recruitment is that people freely volunteer to participate and don't feel coerced (Sieber and Tolich, 2013). Therefore, the decision was made to make initial contact through staff email and managers, making staff and volunteers aware of the study at team meetings. Sieber and Tolich (2013) warn that although the Internet may provide a straightforward way to contact potential participants, it can lead to requests being ignored. One solution is for the researcher to build trusting relationships with participants and community gatekeepers (Archibald and Munce, 2015; Joseph, Keller and Ainsworth, 2016). The researcher considered this, so frequently visited the site to get to know staff informally and establish relationships. Within the new building, recruiting staff was the process of contacting those who had already participated in the Pilot Study to seek ongoing consent. However, some had left the organisation by this time. Replacement participants were easy to access as the researcher had already established strong relationships with people in the organisation. However, as patient and visitor recruitment had not occurred in the Pilot Study, this proved challenging. They were more difficult to recruit than staff in the first instance and required an entirely different recruitment strategy. As detailed in Appendix 1, recruitment was initiated by staff in charge of the specific services and through posters, social media posts, and newsletters. However, if an organisation is involved in identifying potential participants for recruitment, there might be unintended or intended bias (Archibald and Munce, 2015; Joseph, Keller and Ainsworth, 2016), something raised by the NHS REC. However, the "gatekeeper" did not directly contact the potential participants in this instance; instead, information was disseminated to other staff, with no direct involvement or investment in the research project or its outcomes. They were tasked with sending general emails with project information to anyone on

their caseload who matched the inclusion/exclusion criteria. To further mitigate bias and establish an inclusive study, recruitment posters, social media posts, and newsletters could be accessed by those who used the services.

The covid-19 pandemic and the resulting lockdown in early 2020 disrupted the recruitment process for patient and visitor interviews, leading to the need for new recruitment strategies and research methods to suit the restrictions. Due to the lack of access to the building, it became increasingly difficult to recruit patients and visitors for interviews. Additionally, those who did have experience with the building would have to rely on their memories as they had not accessed the building for over a year. A new strategy was devised, and the NHS ethics application was amended for recruitment through the organisation's social media channels and again through staff sharing information with those on their caseload. When staff reached out to potential participants on their caseload that met the inclusion criterion, they reported that the shielding measures of lockdown impacted some patients and clients. Consequently, they felt less able to participate. This was remedied within the ethical considerations of the amended application, with the researcher addressing issues that the interviews may have.

6.4 Collecting the Data

Table 6-3 is based on Creswell and Creswell (2018) identifying characteristics essential to qualitative research. However, this study examines how these characteristics were applied to quantitative and qualitative data.

Research methods included:

- Informal observation (Ethnography)
- visual documentation of the overall building
- Interviews with members of staff across the various services (n13)
- Interviews with patients, families and friends across the various services (n12)
- Questionnaires for staff and volunteers (n50)
- Questionnaires for patients and families (n18)

- Environmental performance assessments (measuring IAQ and dB levels)

Table 6-3 The characteristics of research (adapted from (Creswell and Creswell, 2018)

Characteristics	Application to study	Methods to achieve this
Natural setting	The site under study was the existing and new build PPWH. Observing people within their natural environment and how they interacted within that space provided additional lines of inquiry for the researcher to consider. In addition, environmental measurements were taken within the setting, providing another picture of the environment.	Informal site observation Informal discussion with staff Interviews Focus groups Surveys Environmental monitoring Measuring walking distances
Researcher as a critical instrument	The researcher played a key role in developing the research design and study procedures. The researcher adapting to suit the environment under study and being guided by others within the organisation and supervisors. In addition, the researcher collected, analysed and disseminated all data.	BRMG Supervision Literature review Developing research skills Learning software packages
Multiple sources of data	Multiple sources were developed to collect data rather than rely on a single data source. The qualitative methods collected open-ended data, whereas the quantitative data gathered information through instruments and predetermine scales and options. All collected qualitative data was organised into codes and themes. The quantitative data was used primarily for triangulation with the qualitative data	Desktop review Informal site observation Interviews Focus groups Surveys Environmental monitoring Measuring walking distances
Inductive, deductive and abductive data analysis	The research employs inductive, deductive and abductive data analysis. Using the literature review to design questions and research methods and allowing the qualitative data from the Pilot Study to form additional codes through induction. This permitted an abduction approach to redefining the conceptual framework for Phase 3.	Literature review Conceptual framework interviews

	Then within Phase 3, using a deductive approach to link the established data to existing literature and theories.	
Participants' meanings	The researcher attempted to accurately document and portray the meanings constructed by the participant, seeking validation from them after writing transcripts.	Recording device Transcripts Open line of communication with participants
Emergent design	Throughout Pilot Study, the process was very much emergent. Being determined through the informal observations and data being collected. Allowing the research to delve deeper into the case. An additional Phase to the study was added (Phase 2) to review the design consultation documents and informal discussions with staff around the move.	Desktop review Informal site observation Informal discussion with staff Interviews
Reflexivity	The researcher's background in architecture and research experience within EBD and environmental psychology influenced the study. It helped drive the literature review's direction and provided ideas for the PPWH to determine the project outcomes. In addition, the collaborative involvement with the organisation helped shape the direction of the research	Researchers previous experience BRMG
Holistic account	One of the study's most critical aspects was developing a deep understanding of the case. Involving reporting multiple perspectives, identifying the factors influencing the case, and portraying the larger picture. This "picture" does not take a traditional linear process but documents various aspects of the case.	BRMG All research methods

6.5 Fieldwork Considerations

Beginning fieldwork, researchers are often overwhelmed by the time required to collect qualitative data and questions about the richness of that data. Starting with a

pilot project to gain experience can help estimate the time required to collect data. It is essential to anticipate and prepare for issues that may arise during data collection, including access to the site, procedures for observation, dynamics between the researcher and participants, and availability and access to documentation (Creswell, 2018). Therefore, a Pilot Study was developed and included in Phase 1 of the research protocol. This allowed testing research methods and environmental monitoring equipment to ensure accuracy and assess its value in the study. The researcher spent time around the different public areas in the building to establish themselves within the organisation. The gatekeeper felt that issuing the researcher a PPWH badge would help people feel more comfortable with their presence. The badge specified the name and role as “researcher”, acknowledging them as part of the team but differentiating them from staff or volunteers.

6.5.1 Desktop Review

Documents can be an undervalued data source within a case study, but collating and reading these can be helpful when researching within an unfamiliar setting. Some documents that may be relevant include official documents, planning documents, documents reporting on the project and media coverage. When studying documents, the same methodology should be applied as to that used when observing or interviewing: “one needs to have one's means organised yet be open for unexpected clues” (Schramm, 1971: 68). A desktop review was conducted before gaining UEC approval, as it did not require direct access to the organisation's site. The architects and organisation provided existing literature on the project and included the building's brief, design statement and initial consultation documentation, PPWH reports and accounts and media articles. This allowed the identification of the initial building aspirations and details on the consultation processes. There was a heavy focus on the person-centred aspects of the project, which led to further discussions on the outcomes they would like to see from this study.

6.5.2 Data Storage and Handling

There was often a lack of detail in the literature regarding managing data storage. Some fundamental principles for data storage and handling are: using high-quality

recording devices for interviews; documenting all types of information gathered; anonymising participant data; storing any identifying information separately; and creating a data collection matrix for locating and identifying information (Creswell, 2018). In addition, backing up research information and documenting changes made are essential considerations for all research studies (Davidson, 1996). In most of the researcher's documents, there was a cover page detailing revision numbers, the changes made, the person who made these changes, and the date. This helped track documents and superseded versions, which were retained for older revisions.

6.6 Conclusion

This chapter introduced the Creswell (2018) data collection circle relevant to this study. It included ethical considerations, sampling, recruitment, and fieldwork considerations. This chapter aimed to form a guide for informing similar studies with a non-clinical researcher in a healthcare setting. It documented this study's journey to comply with various research frameworks and policies. The subsequent chapter will set out the rationale for developing the research methods and their procedures.

Chapter 7
Research Methods

Research methods are “the techniques or procedures used to gather and analyse data related to some research questions or hypothesis” (Crotty, 1998: 3). This chapter will address the research methods in detail and the various approaches used within the data analysis, including semi-structured interviews, focus groups, surveys and environmental monitoring, which involved recording walking distances, noise levels and indoor air quality (IAQ). It will then provide details about the dissemination of research and conclude by discussing the transparency around the quality and reliability of research data.

7.1 Scoping Methods

Part of this involved environmental observation, influenced by ethnography: a qualitative research design rooted in anthropology and sociology typically involves collecting observational and interview data related to a particular cultural group within their natural setting over a prolonged period (Creswell and Creswell, 2018). Most commonly, participant observation is a preferred method. However, there is flexibility in how the researcher chooses to observe and their role within the setting, taking the stance of either an insider or outsider (Groat and Wang, 2013). Unlike other research designs, such as grounded theory, ethnography focuses on developing a description and understanding of the culture, behaviour and setting rather than developing a theory. If resources permitted, ethnography would have been a valid research method for the PPWH. However, as the impending move imposed a strict time limit, it became apparent that it would take too much time to establish the

research design and conduct this method. However, the study has utilised it as a research tool (Creswell and Creswell, 2018; Creswell and Poth, 2018). This was achieved by the researcher spending time in the public areas of the building. Determining typical routes for staff, patients and visitors, discovering points of engagement with the environment or interactions between people, and documenting the activities undertaken in each area. It aided an understanding of the organisation, everyday activities and culture. Observations were documented in informal field notes and discussions, aiding the development of the thesis narrative and opening other unexpected areas of investigation. The sketch observations on the plan produce common routes taken throughout the building and give the researcher a good awareness of areas the participants referred to when interviewing, diagrams of which can be found in Chapter 8. Another benefit of observation was having a researcher presence in the building, which aided in developing trust and reassurance, making staff more likely to engage with the study.

7.1.1 Phases of the study

The study naturally developed into three distinct phases. Phase 1 include the Pilot Study where the research methods were developed, tested and refined within the existing PPWH facility at Carlton Place. Phase 2 was added as an intermediate stage, gathering evidence related to the transition process and first impressions of the new facility, in addition to identifying areas of discussion for the future interviews. Phase 3 was a replication of the research method utilised in Phase 1 but with adaptation to the lesson learned from pilot data collection. The phase was conducted in the purpose-built facility with this data contributing towards the findings and discussions chapters of this thesis.

7.2 Collecting the Data

7.2.1 Interviews

The primary research method was semi-structured interviews, inspired by Stake (1995: 64) view that “qualitative researchers take pride in discovering and portraying the multiple views of the case. The interview is the main road to multiple realities”.

Ensuring a deep and holistic understanding of the case was achieved. The interviewer's role is effectively a “repository”, listening attentively and using “prompts” to direct conversation. Interviews for qualitative data collection allow researchers to understand and interpret people's observations, thoughts and feelings, with face-to-face interviews allowing the observation of non-verbal signals and hearing the nuances in verbal expressions. To allow participants to share descriptions and explanations rather than simple yes or no answers, the right questions must be asked, and the physical environment and approach of the researcher carefully designed to develop rapport and trust (Salmons, 2010). In this study, interviews were conducted in the organisation's facility and lasted approximately 45 minutes. The interview schedule comprised a list of open-ended questions, as seen in Appendix 5, developed from the literature reviews but with the flexibility to adapt to narratives presented by the participants. To allow participants to get comfortable with the situation and answer questions, the interviewer began by asking background questions about how long they had worked at the hospice, how they travelled to the building, and describing their job roles and daily routines. This allowed a smoother transition into questions exploring various aspects of the building. To conclude the interviews, participants were invited to provide additional comments about the areas discussed or anything about the building they felt impacted their wellbeing.

As well as the interviews evaluating the building environment, the case study methodology provided the flexibility to explore other interconnected aspects. Therefore, the concluding section of the interview was developed to gather reflections on the building project and consultation process, some of the questions being asked both pre-and post-move. As documented in the following chapter, this built a picture of the transition period and organisational culture, which significantly impacted the new facility's design. Examples of these questions were; their involvement with the consultation process, how informed they felt throughout, any concerns and what they were looking forward to before the move and whether these were realised afterwards. This documented the employee engagement process with the expectations and realities of the new facility.

7.2.1.1 Consideration of Asynchronous Methods

Although most interviews took place face to face, the emergence of the COVID-19 pandemic and subsequent lockdown meant that consideration had to be given to how they were conducted during this time. Three methods were offered to encourage maximum participation, emailing a list of questions, emailing pre-recorded questions, and real-time interviews over the phone or video platform. One of the critical considerations in selecting a method was reducing the participants' burden. A study by Ratislavová and Ratislav (2014) highlights that asynchronous email interviews may have a therapeutic effect by helping participants reflect on their written responses and offer a space to share their thoughts. However, it was considered that this method would require excessive back-and-forth messaging to clarify responses or provide additional information, which would be too burdensome on participants. Another disadvantage of email interviews is the lack of non-verbal and paralinguistic cues (Ratislavová and Ratislav, 2014). Although it was offered as an option to participants, in case this was something they would prefer. Ultimately, all interviews during COVID-19 were conducted via video conferencing or telephone. This was consistent with the synchronous methods used within the other interviews, meaning the collected data was obtained similarly.

7.2.2 Surveys

A survey can produce quantitative descriptions of trends, attitudes, and opinions or test relationships between variables (Creswell and Creswell, 2018; Fowler Jr, 2013). This study employed a survey following the basic principles stated by Sarvimaki (2018), considering; goals and preparation, response format, phrasing of the questions, question order, format and instruction and ethics. Most of these are addressed in this section, but the latter was included in the previous chapter's ethics section. There were two surveys developed, one for staff/volunteers and the other for patients/families; these are provided in Appendix 6a-b.

Goals and preparation

As documented in Chapter 4, there are widely used commercially available post-

occupancy surveys. However, initial consideration was given to the main topics of the survey and the purpose of each question (Sarvimaki, 2018) to receive data meaningful to the research. To develop a set of questions, equal consideration was given to the building evaluation and EBD literature reviews and the study's research questions. The survey questions were influenced by techniques that Stevenson and Humphris (2007) employed in the post-occupancy evaluation of the Dundee Maggie's Centre and PROBE studies. The main goal of the questions was to determine how satisfied various user groups were with the areas identified in the conceptual framework, specifically, satisfaction with choice, environmental conditions, layout, accessibility, adaptability and access to nature. Two surveys were developed, one for staff and volunteers and one for patients and families. Although they contained similar questions, they had additional specific areas appropriate to each stakeholder group, such as "work environment": only applicable to staff and volunteers.

Response format

A critical aspect of good survey design is determining the advantage and disadvantages of closed and open-ended formats (Sarvimaki, 2018). Closed-ended questions allow participants to rate their answers on a scale, producing quantitative data. In contrast, open-ended questions allow participants to respond freely to questions, producing qualitative data (Creswell and Plano Clark, 2017). Another consideration in determining the response format is how the data will be analysed and reported (Sarvimaki, 2018). Although there were open-ended questions, the majority were based on an ordinal, 5-point Likert scale with a choice of two positive, one neutral and two negative responses. This scale allowed the survey to adopt a similar correlation technique by Stevenson and Humphris (2007). Their research utilised two questions, one on self-reported health ratings and the other on quality of life, to identify correlations between these and satisfaction with environmental features. Regarding the analysis, the paper-based responses were coded and entered into Excel, with online responses being automatically transferred. These were then exported into SPSS where frequency queries were calculated to determine overall

satisfaction, further divided into satisfaction by user group.

Phrasing the questions and question order

The survey follows the sound design principles proposed by Sue and Ritter (2012): questions being easy and quick to answer, progressing logically, grouped on topics, with bold or colour used to highlight important words. This also complies with suggestions by Sarvimaki (2018) that questions should run logically, be short and unambiguous, ask only one query per question, exclude leading questions and begin and end with shorter, straightforward questions.

Format

For the Pilot Study, it was suggested by the PPWH that a paper-based survey would gain a higher response rate than an electronic version due to certain groups not having or maintaining frequent access to email addresses to which the recruitment email would be sent and patients and families difficulty accessing the online versions. This allowed participants to complete the survey in their own time, with the benefits of a physical copy being a reminder to complete and return. Lessons learned from the Pilot Study of surveys informed research in the new facility by utilising a hybrid of paper-based and online surveys developed in Qualtrics.

An important consideration was the process of voluntary participation, even down to the level of what questions participants wished to answer. For example, in paper surveys, participants could leave questions unmarked, which was extended to online methods to not pose additional ethical concerns (Sue and Ritter, 2012).

Instruction

Instructions for completing the survey should always be provided (Sue and Ritter, 2012). These are important for explaining the practical aspects, such as completing and returning information about the study, gaining informed consent, and publishing the information (Sarvimaki, 2018). These are included as the cover page of each paper survey and the first page of the online version.

7.2.2.1 Feedback

Throughout the development stage of the survey, the questions and format were thoroughly discussed within the BMRG. The research group was then asked to provide feedback on layout, format, clarity, the relevance of questions, and anything else they identified as issues. Following feedback, some questions were re-written for clarity, dividing questions that asked more than one thing and removing ambiguous or superfluous words or phrases. A consensus with the feedback was that the survey did take around 10 or 15 minutes to complete, with many questions. Although everyone felt these questions were relevant, only a few were excluded. Some of the specific discussions for changes were:

- It should be in "easy read" format, as many patient participants were older or had visual impairments. For this, the font size was made larger to 12pt minimum, Arial font was used and bold to denote key areas rather than underlining.
- The ethical considerations ensured that only necessary background data relevant to the study was requested, complying with and excluding biases (Sarvimaki, 2018). In addition, options were given to allow participants to respond, "prefer not to say".
- The hospice lowered the admissions age from 18 to 15, with the new building providing space for "young adults" ages up to 39 years old. Therefore, to capture respondents who might fall into the new age ranges and Young Adult categories, the survey age range was tailored to suit by including a 16-18 age range rather than 18+.

7.2.3 Walking Distances

Research by Yi and Seo (2012) had determined that increasing walking had many health benefits, but there were few cardiac or stress-relieving benefits within the medical community. Measuring walking distances was one research method explored in-depth, particularly using indoor positioning systems (IPS). However, the cost and time implications of implementing such measures became apparent, with products available proving too expensive and developing a grassroots method too time-

consuming. Therefore, it was decided that as one benefit of the Sengetun was reducing walking distances, it would be most relevant to use personal devices that measure walking distance. Fitbits were purchased and given to five members of IPU staff, including nurses and healthcare assistants. To remove any potential bias by participants being able to track their steps and potentially being encouraged to walk more, the devices were covered up - only the research team had access to the data. After measuring participants' step counts, the researcher transferred this information onto the Fitbit application. Although it was evident that the app had access to minute-by-minute data, it only documented these in 15-minute periods and could not be exported on mass. Therefore, after much research, a Java code that could download minute-by-minute data called “interday data” was discovered and adapted for use in this project through google sheets. However, in Phase 3 of the study, parts of the code had been depreciated, meaning the scripts failed to run. Therefore, data had to be collected directly from Fitbit and the 15-minute windows they provided. Although the analysis from the Pilot Study showed that interday did not play a significant role in the findings, as results were presented during a shift rather than per hour. Therefore, the data included within this thesis are based on graphical information taken directly from the Fitbit application, with the steps and distances calculated per day.

The data was analysed against research by Welton *et al.* (2006), which revealed that nurses typically walk 4-5 miles during a 12-hour day shift and slightly less during night shifts. It was also compared to the total daily walking distances from the Pilot Study in the previous facility. To this end, 4-5 miles was used as a benchmark concerning 12 hours shifts experienced by participants within the PPWH IPU. It was perhaps obvious that the hospice, being on a smaller scale than standard hospital environments, would lead to reduced walking distances compared to averages. However, this study aimed to benchmark against the Pilot Study to determine if the Sengetun achieved its benefit of reduced walking distances.

7.2.4 Environmental Monitoring

Evaluating indoor environmental quality (IEQ) can be integral to a POE. This can

involve measuring factors that impact the comfort and wellbeing of users, such as; temperature, humidity, CO2 and pollutant levels, noise and light. These can either be “spot-checks” or monitored over a specific period. The monitoring strategy should be designed to address the specific requirements and parameters of the building being evaluated (Agha-Hossein, Birchall and Vatal, 2015). A systematic approach was adopted, producing a timetable and location map; see Appendix 7a-b. Locations were discussed and confirmed by a walk round with a management staff member. A poster was produced to sit next to the devices and placed around the building to ensure awareness. These monitors were employed within both the pre-and post-evaluation and placed in comparable environments, i.e., single bedroom to single bedroom, nurses' station to central unit space with nurse's desk.

7.2.4.1 IAQ

The use of air quality monitoring was introduced into the methodology shortly before Phase 1 of the data collection, addressing technical performance data that was planned to be undertaken by another company but that ultimately never went ahead. Measures were designed and adopted in this study involving IEQ monitoring as it could prove beneficial to triangulating the qualitative data. Various monitors and instruments are available for measuring temperature, relative humidity (RH), carbon dioxide (CO 2), carbon monoxide (CO) and volatile organic compounds (VOCs). The device chosen could be plugged into a wall socket and measured temperature, RH, and CO 2.

The data was analysed against standard ranges in which temperature, relative humidity and CO2 levels should fall to establish a good indoor air environment. Levels of CO2 under 400 ppm are typically found in outdoor environments, with guidance suggesting that levels of CO2 within indoor environments should be no more than 1000 ppm. Levels higher than this indicate a poor ventilation rate (CIBSE, 2011). Relative humidity levels should sit within the range of 40-90%, with less than 20% causing skin or eye irritation for some people and above 70% being uncomfortable with the associated threat of surface condensation and mould growth (HSE, 1992a). Health and Safety Executive (HSE) guidance suggests that in

workplace environments, the temperature should be no less than 16ºC. Although there is no guidance on maximum temperature, it can become uncomfortably hot when it reaches over 30ºC (HSE, 1992b). The average ambient temperature for indoor environments should be between 21-22ºC. However, in healthcare environments, the temperature is usually kept a few degrees higher than average to account for ill patients who are more susceptible to feeling the cold.

7.2.4.2 Noise

Noise can be measured with a sound level meter (SLM) or SLM smartphone app (Agha-Hossein, Birchall and Vatal, 2015; CDC, 2019). The researcher contacted another hospice organisation, which provided the information they used to conduct and monitor sound levels. They did so through hourly spot-checking on an iPad app conducted by staff responsible or the delegated staff on shift (as recordings were taken 24hrs), writing the figures down. However, staff often forgot to record the levels when the staff responsible was not on shift to take measurements. There, for this study, It was decided that a device that could continuously record and log data would be more efficient and less susceptible to human error. The locations chosen were those deemed sensitive to noise, according to staff. The devices would record both dBA and dBC, but as the human ear recognises dBA, the device was set to record this.

The data was analysed against guidelines by the WHO recommends that night-time noise levels in hospitals should be between 30-45 dB, with under 40 dB creating the ideal sleeping conditions and sleep or rest being disturbed when noise reaches over 55dB (Berglund *et al.*, 1999; WHO, 2009). However, studies have shown that these maximums were often exceeded, with typical levels ranging from 48 to 46 dB, with some peaks exceeding 85 db. In addition, research by Berglund *et al.* (1999) states that levels over 80db can be related to changes in social behaviour, such as reduced helpfulness or aggression. To put these figures into perspective, 30dB would be a whisper, normal conversation would be about 60 dB, and 85dB would be the equivalent of traffic noise or a lawnmower (CDC, 2019).

7.2.4.3 Limitations of the Methods

There were some limitations with the monitoring device, both in efficiency and application. Consideration should be given to the battery life of sensors. If possible, those requiring an electricity supply should be hardwired to prevent them from accidentally being switched off (Agha-Hossein, Birchall and Vatal, 2015). However, this was not possible with IAQ monitors due to the limited number of available monitors, the frequency they had to be switched to separate locations, and them being hardwired. This barrier was overcome by placing do not remove stickers over plugs and making domestic and other staff aware of their presence. Although, at the start of the Pilot Study, there were difficulties with devices being accidentally unplugged or moved, even with “do not unplug” labels. Once unplugged for a certain amount of time, the device lost its readings, and if unplugged and then plugged back in, the device would reset and not record data. It could not be determined if these instances occurred until the device had been plugged into a computer for data transfer, meaning that when this occurred, data collection for the period would have to be repeated. Another issue with these devices was when it came to Phase 3 of the data collection, two years post-move, the IAQ devices from the Pilot Study had stopped working correctly, potentially due to issues of not being in use for a prolonged period. However, the SLM continued to work. New IAQ monitors were purchased that seemed to work more efficiently than the previous ones. One ethical issue arose with the SLM and IAQ devices in the Pilot Study. Although, after the briefing, the patient was content with it being placed in the room, the patient's family was unsure of the device. Therefore, it was taken out, and another room was agreed between the researcher and staff, seeking that patient's consent.

7.2.5 Phase 2 Data Collection

This data collection phase involves management interviews and focus groups, established as interim reports. As data from these methods were not included in the main findings, they are not explained in detail within this thesis. However, this data collection phase helped inform the project's organisational culture and background about people's experiences with the process.

7.3 Inference of the Qualitative Data

7.3.1 Inference

Inference, or forms of reasoning, inform part of the research approach (Creswell and Poth, 2018). inference can conclude from evidence and be deductive, inductive or abductive (Schwandt, 2014). Deductive reasoning is typically employed in quantitative research and involves existing theory driving the data collection and analysis, with the discussion linked to existing literature. Inductive reasoning is typically employed in qualitative research and involves drawing interpretations or meaning from collected data. Charles Sanders Pierce (1839-1914) was the founder of pragmatism and developed abductive reasoning, which is a method of discovering hypotheses or theories that is distinct from induction or deduction. Unlike deductive testing of hypotheses or inductive generalisation from collected data, abductive reasoning aims to generate new findings and theories. In this study, an abductive approach was employed, using existing theory to develop methods for conducting building evaluations and inform data collection methods. The findings were then used to establish and build upon existing theory, which was in line with the abductive reasoning approach.

7.3.2 Qualitative Data Analysis

There are many approaches to analysing qualitative data: narrative analysis, content analysis, conversation analysis, discourse analysis, and thematic analysis (Butler-Kisber, 2018; Harper and Thompson, 2011). It is crucial to decide this before transcription, as this will determine the level of detail required to be obtained (Braun and Clarke, 2006). As thematic analysis was being used within the study, as explained in a subsequent section, there were no strict, predetermined guidelines for transcription. However, a rigorous and thorough verbatim account of the interview is essential and remains “true” to its original nature (Poland, 2001). All the interviews were audio-recorded and transcribed verbatim. Common filler words such as “so” or “like” were excluded for clarity, with any regional dialect excluded to ensure participant anonymity. However, any significant alterations to the quotes used within the findings were enclosed in square brackets []. Most common were exclusions of

specific names and the generalisation of gender to them/they in certain instances to protect anonymity. Stake (1995: 66) view was that “getting the exact words of the respondent is usually not very important, it is what they mean that as important”. He states that verbatim transcription can be discouraging for participants, as it may not accurately represent what they intended to convey or lack eloquence in their speech. Therefore, the researcher may need to revise and improve the transcript's style. In some cases, the researcher did make stylistic changes to the transcript to better reflect the participant's views. When participants expressed concerns about discrepancies in the transcript, the researcher made necessary adjustments and discussed them with the participants.

7.3.3 Grounded Theory Approach

Grounded theory (GT) is a research methodology that can often be misrepresented when discussed in relation to studies. It can often be viewed as a way to organise, analyse and present data through coding and categorisation. However, it is inherently a systematic research approach to constructing a theory or model from the data (Singh and Estefan, 2018). Interestingly, the first use of GT was in Glaser and Strauss (1965) Awareness of Dying, a text explored in Chapter 3. It is widely used within nursing research and has evidenced a real-world impact on improving care quality (Nathaniel and Andrews, 2009; Singh and Estefan, 2018; Stacey *et al.*, 2019). One of the primary outcomes of GT is that a preconceived theoretical framework does not limit it but instead develops a theory that is deeply grounded in the data and context (Glaser and Strauss, 1967). Thus allowing data collection and analysis to be driven by key ideas relevant to the discipline (Charmaz, 2006). For example, Glaser and Strauss (1965) goal with the introduction of GT was “that readers would almost be able to see and hear the people involved in terminal situations - but to see and hear them in relation to our theoretical framework” (Glaser and Strauss, 1967: 241).

This study, however, had already established its methodology and thereby utilises GT in a way some, as mentioned at the beginning of this section, might construe as inappropriate or “misrepresented”. This study follows a fixed mixed methods design, which was predetermined and planned to use quantitative and qualitative methods

rather than an emergent approach, added later to support or improve findings (Creswell and Plano Clark, 2017). Instead of a pre-defined and overarching theoretical framework and hypothesis, this study employed "sensitising concepts and theoretical codes" to establish a loose theoretical framework to guide the study. This theoretical framework formulation was rooted in GT studies (Charmaz, 2006). It adopts Charmaz (2006) stance that GT methods can complement, rather than oppose, other approaches to qualitative research. Commenting that those who are not totally driven by GT, or perhaps acknowledge only aspects of the approach, can "bring an imaginative eye and an incisive voice… their works transcend their immediate circles" (Charmaz, 2006: 9). From its first introduction, Glaser and Strauss have "invited their readers to use grounded theory strategies flexibly in their own way" (Charmaz, 2006: 9).

Contrary to traditional GT approaches, Charmaz acknowledges that researchers will almost always have exposure to existing literature, even before commencing the study, but recognises the importance of understanding the broad context of the topic. One of the founders of GT, Glaser (1998), later acknowledges that when faced with the prerequisite to conduct a literature review before data collection, as is a typical requirement of PhD programmes, the literature review should turn into data collection, which is in a constant state of comparison. Acknowledgement is given to the similarities between GT and "constant comparison inquiry" by Butler-Kisber (2018). They state that it can highlight common experiences and provide an evidence base to advocate for policy change. Something this study aims to contribute towards. This flexibility allowed the devised theoretical framework to inform specific arguments instead of the entire research project. This allowed the theory to be identified and defined on the evidence gathered rather than existing theories. It can be a flexible tool for building conceptual frameworks that can be applied to research from across paradigms or studies that employ none (Robson and McCartan, 2016).

By utilising a mixed methods case study methodology, the researchers were able to combine elements of GT in the qualitative analysis with other aspects to drive the study forward. This approach created a dynamic interplay between pre-existing

theoretical frameworks and the development of new theories that built on these, ultimately situating the research firmly within the context of the case study being examined. The GT approach provided a systematic way of analysing the qualitative data and aligned with pre-defined themes within the literature review of EBD. With a deductive approach taken on a thematic analysis of the data. The researcher's background in Environmental Psychology, relating to the Biophilia Hypothesis and Art, had provided a basis for formulating a loose theoretical framework fusing building evaluation studies and wellbeing. Before formal ethical approvals, it was agreed between the PPWH organisation and the researchers to conduct some informal scoping fieldwork to understand the environment and organisation better. This approach dictated the direction of the study. It thus informed the decision to utilise a GT approach within the methodology. Where better to fully explore and understand the case study than looking to gather knowledge from those who created the case of study; the architects, the organisation and the people? This methodology ultimately led to co-creating the study design and research findings.

7.3.4 Thematic Analysis

Braun and Clarke (2006) have described thematic analysis as a six-step process: familiarise yourself with the collected data, generate initial codes, search for themes, review themes, define and name themes, and produce a report. This differentiates from the GT approach of collecting and analysing data simultaneously (Creswell, 2018). Braun and Clarke (2006) advocate that it is “ideal” to collect all data before analysis, as ideas and patterns can be identified when reading the entire data set together. However, due to the semi-structured nature of the interviews, there was an informal iterative process as the researcher was consciously aware of what topics required more focus. Generally, this study follows Braun and Clarke (2006) approach, each step detailed below.

1. Familiarisation with the data: if the data is collected by the researcher doing the analysis, there might be some analytical thoughts formed. Total immersion in the data is crucial for effectively analysing what can be done through constant doing, dynamic analysis, and comparisons (Braun and Clarke, 2006). Transcription can

be a good way to achieve familiarisation (Riessman, 1993); this study involves a process of frequent relistening to recordings, typing and re-reading to ensure it was transcribed verbatim. The transcripts were read as an entire data set before initial coding. Handwritten notes were taken at the interview, indicating keywords or reoccurring topics.

2. Generate initial codes: Having undertaken the thematic analysis of Pilot Study data by hand and data from the new facility using the software NVivo, it was clear as to the benefit of utilising the software; being able to code the same text in multiple categories, quickly amending mistakes and swapping out codes or renaming them—something which was more challenging with printouts and physical notes. For transcripts coded in NVivo 12, pre-formulated codes interpreted from the written notes were created. The transcripts were then coded with their relevance to the impact of the environment on people. There were some theory-driven codes derived from the development of the theoretical framework. Some of these were as follows: environment and care model: noise, temperature, air quality, nature, inclusion, choice and design. There were also data-driven codes, highlighting important aspects to the participant, including "engagement with people" and "supporting resilience".
3. Searching for themes: this step involves collating the codes into themes (Braun and Clarke, 2006). This was achieved by grouping codes into themes related to the theoretical framework, providing a narrative for writing up the findings and, in some instances, becoming overarching themes in themselves.
4. Reviewing themes: at this stage, themes are reviewed, with some being discarded or merged (Braun and Clarke, 2006). That involved reading all the coded extracts for each theme, ensuring sufficient evidence to retain the theme, moving codes to a different theme or, in some instances discarding the theme or codes altogether.
5. Defining and naming themes: sub-themes and themes were also moved around the topics to ensure they retained a suitable narrative and adequately answered the research questions.
6. Producing the report: there is a need to provide enough data extracts to evidence each theme and point being made, organised within a narrative designed to interest the reader (Braun and Clarke, 2006). Each theme had been categorised

based on the most commonly reoccurring threads of discussion, supported by the related quotations. Findings have been written up and presented within a series of reports provided to the PPWH, and the key findings within Chapter 9.

7.4 Dissemination

The researcher can adapt to multiple roles within a case study, including "teacher, participant-observer, interviewer, reader, storyteller, advocate, artist, counsellor, evaluator, consultant, and others" (Stake, 1995: 91). Stake (1995) suggests that the case study report could fall between storytelling and a formal research report. However, it is necessary to note that one common problem within case studies is the amount of data collected; a warning given by many (Merriam, 2009; Stake, 1995; Yin, 2018); "we have to be careful not to get buried by avalanches of our own making" (Walcott 1990, p35 as cited in Stake, 1995: 84). This is considered as the researcher adopted various roles through the research journey, evidenced in this thesis. Drawing on the advice of Leaman (2010b) from Chapter 4, all the data collected had been included within smaller reports, carefully considered to be as concise as possible and provided to the hospice to share at their discretion. A key aim was to produce a report that was easily understandable and intriguing to read, drawing the reader into the story of the case and caring about its importance.

7.5 Quality of Research Design

Validity in quantitative and qualitative methods can differ, but both support the same function by ensuring the data quality, results, and interpretation. Validity within qualitative research relies on analysing procedures. In contrast, validity within quantitative research relies on the quality of both scores from the instruments and the conclusion drawn from the analysis (Creswell and Plano Clark, 2017). As a case study relies on multiple sources of evidence, it is often helpful if the data can be triangulated (Yin, 2018). Triangulation aims to "seek convergence, corroboration or correspondence of results from multiple methods" (Greene, 2007: 100). This requires for each method to be treated independently so that one does not influence the other (Greene, 2007). If a study uses convergent evidence, then triangulation can

strengthen the construct validity of a case study. In addition, gathering evidence from multiple sources can increase confidence that the findings will document the case study accurately (Yin, 2018). To triangulate the data, quantitative and qualitative methods were used to evaluate the same case. For example, the study had three interrelated methods: interviews, surveys and monitoring. One example was survey questions asking for ratings of environmental conditions, interviews asking for personal perceptions and experiences, and monitoring devices measuring actual levels. A detailed and extensive procedural document ensures the research design can be replicated, increase reliability, and minimise the risk of errors or bias within the study (Yin, 2018). A project protocol was produced for this study to ensure reliability. This thesis also documents and discusses considerations and procedures employed in this study, most notably within this and the two previous chapters providing an in-depth description of the methodology, data collection strategy and methods employed. Yin (2018) suggests that the quality of research design can be determined within case study research through four criteria. Table 7-1 provides measures taken through the research to ensure these criteria were met.

Table 7-1 How this study achieves Yin (2018) case study research design quality.

Criteria	**Principles**	**Measures to ensure study compliance**
Construct validity	Define the study in terms of specific concepts Identify ways to measure these concepts.	Research questions Developed multiple research questions that were tested and defined throughout the pilot phase Theoretical and conceptual frameworks Gathered existing literature and guidance on tools and techniques employed within building evaluations Data collection Qualitative research questions related to the research questions and objectives
Reliability of data	Use of multiple sources of evidence Addressing alternative	Data collection Five stakeholder groups were included at various levels throughout the data collection: management, patients, family, friends, staff and volunteers.

	perspectives	Mixed methods Quantitative data was embedded within the qualitative study to help triangulate findings.
External validity	Use theory to drive single cases Use replication logic in multiple cases	Theoretical framework Gathered existing literature to help inform theory development Benchmarking Used pilot case to develop and refine data collection. In addition, using the valid results to benchmark results post-move.
Reliability	Ensure sound research design Document procedures to allow replication of methods	Protocol A project protocol was developed, documenting the data collection, analysis and ethical considerations. The research design is also further evidenced within this thesis Review Analysis was reviewed multiple times to ensure accuracy

7.6 Conclusion

This chapter introduced scoping methods used for the Pilot Study, established a grounding in the topic and research field. Then, it detailed the research methods, procedures, purpose, development, collection and analysis. The inference of quantitative data was provided, along with its influences and scope in GT. It discussed Braun and Clarke (2006) six-step thematic analysis process for analysing and presenting the data. Concluding with how this thesis complied with quality in case study research. The subsequent chapter introduces the findings section of this thesis, an introduction of the organisation, people and facility involved in the study.

Chapter 8
Introduction to the Findings

Prior to reporting the findings, it is important to build a more comprehensive background of the project, allowing readers to place the findings into context. Therefore, this chapter provides an understanding of the hospice organisation and their involvement with the building project. Then, it describes the new facility by departments and frequent routes, illustrated on floor plans. Finally, it provides the demographic and statistical information related to the sample for the research methods.

8.1 From Aspirations to Actualisation

A conversation the PPWH CEO had with a teenage patient sparked the idea for the new facility. "'He took one look at the Day Services room and said – that's not for me," recalled the CEO at the appeal launch. "It was because the majority of people in there were over 50, and the whole environment was simply wrong for someone his age… It made me think – how can we make this better?" (Baillie as cited in Priest, 2016). The Prince & Princess of Wales Hospice (2015) documents the problems in the existing facility, with a lack of adaptability to satisfy their ambitions and keep up with modern palliative care demands.

> "if the wards had been on the ground level [in this building] with a big garden, we would have still been here… we can't expand anymore - that was a deciding factor when they said, "we need a new building"" – Staff

Once the limitations of the existing PPWH facility were established, the organisation

began assessing the growing needs of the hospice services to develop project aspirations. The PPWH worked closely with the Project Architect, who introduced them to the concept of the Sengetun model of care; helping to establish a clear vision for a design which could adequately support the high quality of person-centred care already provided.

In terms of the PPWH organisational values, they have been consistent throughout the years:

- Person-centred compassionate care;
- Value all as part of the hospice community;
- Fairness and integrity;
- Dignity and respect;
- Striving for excellence

(The Prince & Princess of Wales Hospice: 2019)

In addition, the PPWH set out strategic aims for 2018-2020, further informing of their organisational values and goals:

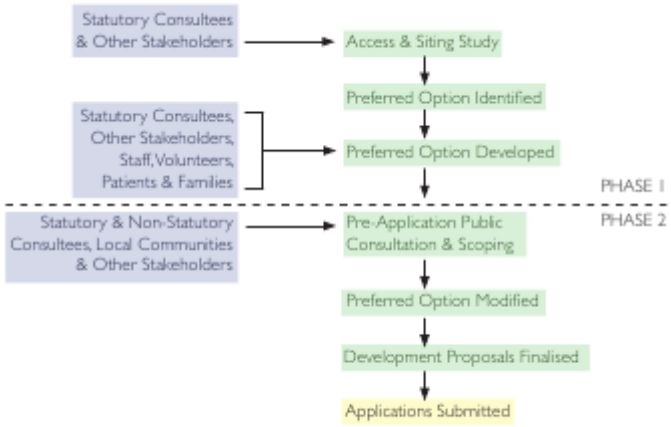
- Lead - Maintain a leading position in the delivery of palliative/end-of-life care through to bereavement care for all those affected by a life-limiting condition.
- Learn - Develop our local, national and international research and knowledge sharing with a focus on the education and support of the workforce providing care.
- Collaborate - Develop and deliver our services in collaboration with patients, families and our partners.
- Transform - Develop a comprehensive digital strategy to support effective delivery of our clinical services.
- Reveal - Work with our communities to develop an understanding of the importance of good palliative/end-of-life care through to bereavement care

(The Prince & Princess of Wales Hospice: 2019)

The project's consultation period began in 2011, with involvement continuing

throughout the design development stage (Pert *et al.*, 2013b). The project required a Pre-Application Consultation (PAC), as the facility exceeded 5000 sqm and was classed as a "Major Development" under the Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009. The architectural practice, led by the Project Architect, produced a report documenting the PAC period and additional consultation activities throughout the design development (see Figure 8-1). The consultation process formed an essential part of the project, which aimed "to improve awareness of the hospice proposals, provide stakeholders with information about the project and also to provide them with opportunities to influence the development of the proposed hospice" (Pert *et al.*, 2013b: 9). The PAC process had two phases: the first was consultations with staff, volunteers, patients and families; and the second was with the public and wider stakeholders. Part of phase one consultations involved

Figure 8-1 Overview of consultation during the project (Pert et al., 2013b: 9).



design workshops, with this feedback being incorporated into the final design (Pert *et al.*, 2013b). Staff involved with the initial consultation process felt engaged with the project, with workshops facilitating collaboration on lists of their requirements, how they use their space, and involvement with the design development. Comments from staff about the consultation process showed they felt valued and supported within the organisation, which led to positive employee engagement with the project.

The PPWH needed to raise £ 21 million for the new facility while still maintaining its current services and existing facility. With £6 million of project funding secured

through Revenue Reserves, a Capital Appeal Fundraising Team was formed to fundraise the additional £15 million (The Prince & Princess of Wales Hospice: 2019). The PPWH board announced they had successfully reached the required funds in June 2018 (The Prince & Princess of Wales Hospice: 2019), the largest capital appeal by an independent hospice in the UK. In October 2018, the hospice transitioned from its previous facility at Carlton Place to its new purpose-built facility at Bellahouston Park.

Strong leadership within the organisation, led by the CEO, established the initial idea and drove the project forward. The involvement of staff with the facility's design during the consultation period helped communicate their vision and allowed staff to engage with the process. Acknowledging and incorporating their opinions within the facility led staff to become personally invested in the change. In addition, it ensured that the values and beliefs of the staff and the PPWH organisation remained well aligned.

8.2 Hospice Departments

Four hospice departments are located within the new building: the IPU, Day Services, outpatients and family support services. In addition to these, there are public and staff areas. All of these spaces are described below, with floor plans included in Appendix 8 and 9.

8.2.1 Inpatient Unit

The inpatient unit (IPU) occupies the entire lower ground floor of the building and adopts the Sengetun care model design (see Figure 8-2). There are 16 single rooms with ensuite facilities, split over two units of six and ten beds. Each self-contained unit, known as a “bed cluster” or “Sengetun” in Norwegian, comprises single rooms with personal garden access, a central communal seating area for socialising and staff operations, family garden room(s), domestic service room (DSR), linen store, assisted bathroom, and sluice. The family kitchen and dining area with visitor toilets are at the centre of the plan and shared between the two wards. Beside this and leading down from the main entrance staircase and lift is the IPU reception desk and

Figure 8-2 Diagram of Sengetun care model within the PPWH IPU.

team office. There is a dedicated lounge for young adults, with a courtyard garden. In the same vicinity are two family bedrooms, which open onto the family courtyard, and a multi-sensory room. A smoke room is provided as an enclosed mechanically ventilated space. The plan includes an auxiliary section, situated away from the public circulation area, which contains the back-of-house areas that support the operation of the IPU. These areas include rooms such as the staff break room, toilets, staff kitchen, drug presentation room, the mortuary, and additional storage spaces.

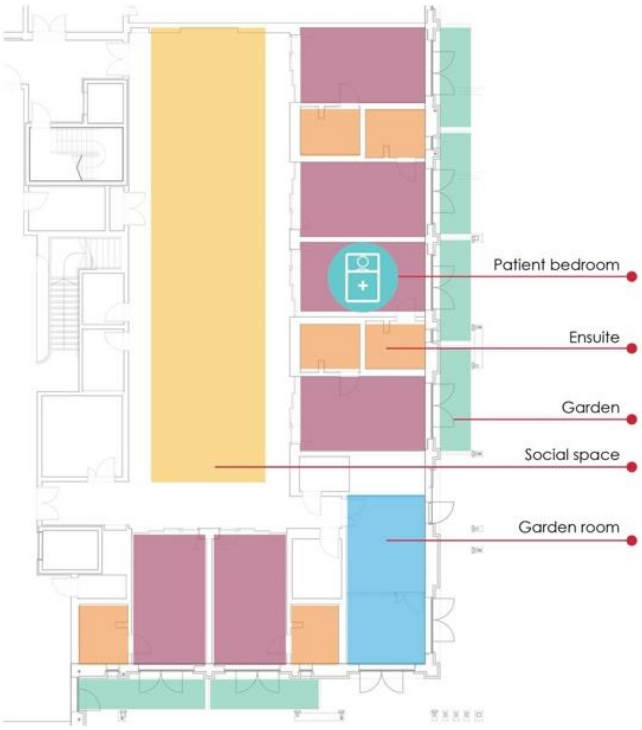
8.2.1.1 Innovative Model of Care

One of the unique aspects of the PPWH was incorporating the Scandinavian Sengetun care model within the inpatient unit. The model was previously employed at St. Olav's Hospital in Norway (Nordic), but it would be the first used within a palliative setting in the UK (The Prince & Princess of Wales Hospice: 2019). Its incorporation at Bellahouston aims to place patients and families at the heart of the facility. It establishes two groups of individual patient bedrooms clustered around a

central social space, with auxiliary areas separated from patient areas. Benefits of this model include improving orientation and establishing a more comfortable and safer environment for patients and families, increasing privacy, improving communication, and reducing unnecessary travel time for staff (Pert *et al.*, 2013a). Figure 8-3 shows the key features of one of the units. In addition to the benefits of the Sengetun, the main aspirations for the IPU followed person-centred attributes, including:

- Establishing a model of care adopting the person-centred Sengetun model;
- Providing 16 individual patient bedrooms with ensuite;
- Providing suitable services for young people;

Figure 8-3 Diagram of all important elements of the Sengetun layout within one of the units.



- Providing more family areas;
- Providing communal dining areas for patients and families; and
- Providing accessible garden areas.

8.2.2 Day Services

Day Services is on the ground floor, encompasses a spacious lounge area with direct access to secure balconies, as well as a multipurpose room and a quiet room. Shared with Outpatient Services, this area also features treatment rooms, information areas, accessible toilets (one of which meets “changing spaces” standards and had a shower), a tea area, a staff office, and storage facilities. These versatile spaces enable PPWH to collaborate with external organisations and offer additional patient services, such as Macmillan's weekly “Improving the cancer journey” clinic. The Art Room is an essential part of Day Services, and opportunities to use this service are open to outpatients, inpatients, and family sessions. Moreover, some of the Young Adults who attend Day Services make use of the Young Adult Lounge. A distinctive feature of this service is the walking groups that take Day Patients on excursions into the hospice gardens and beyond, into the wider park.

8.2.3 Outpatient Clinic

The Outpatient Services are on the ground floor, beside the Day Services Lounge with doctor and nurse-led clinics. This area features four consulting rooms, a treatment room, three complementary therapy rooms, and a nail and hairdressing salon. The Outpatient Services also have a dedicated waiting area outside the day service lounge and share the aforementioned facilities.

8.2.4 Family Support Services

Family Support Services are situated on a private and self-contained ground floor area, adjacent to the main reception. It comprises four counselling rooms, a room that can be adjusted to accommodate children and young adults, an accessible toilet, a tea preparation area, and a direct exit from the building. The service provides diverse types of counselling to aid the families of patients, which includes both group and individual sessions. Additionally, the Family Support Team's primary offices are situated on the first floor.

8.2.5 Public Areas

The building's public areas, including the shop, café, and reception, are all located on

the ground floor, accessible to all. The seasonal gardens and bothy are also open to the public. The main reception serves as the primary entrance for most family and friends, the public, and staff. However, there is a separate patient entrance at the side, commonly used by day and out-patients for deliveries. At reception, there are typically “greeter” volunteers positioned near the front door to welcome visitors and guide them if necessary. Additionally, a staff member is always present at reception, and after hours, the porters take over the duty.

8.2.6 Semi-Private Areas

Three meeting rooms are located on the first floor, dispersed throughout the offices. There is also a self-contained education suite with a large conference room that can be used as an independent space with dedicated toilets and a tea preparation area with a dining area and outdoor terrace. The education suite can be hired out by internal and external groups and organisations. The viewing room was on the ground floor, a space that families could access. In addition, beside the reception was the sanctuary which is used by patients and families and the Eddie Lloyd room, which is used by families collecting their relative's belongings and death certificates.

8.2.7 Private Areas

The majority of the offices are situated on the first floor, with team offices located within their respective departments. The laundry is situated within the IPU on the lower ground floor, but domestic staff typically work throughout the building to ensure a clean and tidy environment. Porters also work throughout the entire building, with a workshop space located on the ground floor near the patient entrance. During after-hours, the porter would be stationed at reception. The morgue is located on the lower ground floor, accessible via the lift, with a private area available for vehicles to drive into the building.

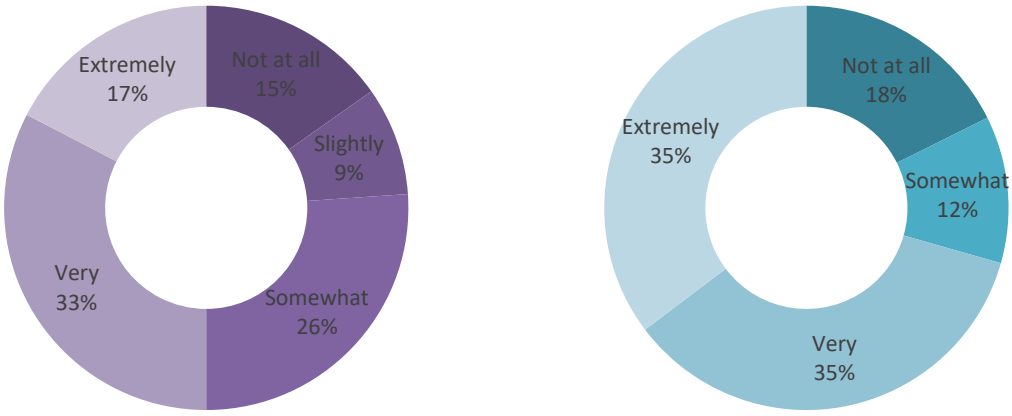
8.3 Participant Background

There were 93 participants across all the research methods for Phase 2 and 3 of the study. 25 interviews and 68 survey responses, as shown in Table 8-1 and Table 8-2. Chapter 7 details how the research data was collected, analysed and reported. In summary, survey responses were anonymised from collection and did not require amendments. Interview transcripts were edited to clarify and exclude identifying information; square brackets depict these edits. In addition, due to specialisations and specific projects, certain staff had the potential to be identified through their comments. To mitigate these, quotations are assigned to groups ('staff" or "patient" or "family / friend") rather than individual participant codes to prevent cross-referencing of quotations. Any identifiable quotations, some of which could not be amended, were discussed and agreed upon with the participant before inclusion. Out of the survey respondents 85% of staff and volunteers and 82% of patients and families felt the building impacted on their wellbeing (Figure 8-4).

Of the staff interviewed (n13):

- 54% (n7) had work involving direct care of patients or families;
- 23% (n3) had work interacting with patients, families, or friends; and
- 23% (n3) had limited or no work involving patients, families or friends but worked closely with staff and received feedback.

Figure 8-4 Staff & volunteer (purple) and Patient & family (blue) rating of building impact on wellbeing.



Questionnaire Response method:

- 16% (n11) paper-based; and
- 84% (n57) online.

Table 8-1 Participant population

Questionnaires (n68)		**Interviews (n25)**	
Staff & volunteers (n50)	Patient/family/friend (n18)	Staff (n13)	Patient/family/friend (n12)
Volunteers (n28) Nurse (n5) Healthcare Assistant HCA (n7) Family Support Services (n1) Office-based (n4) Allied Healthcare Professional AHP (n1) Not specified (n4)	Patient (n4) Family (n14)	Management (n3) Nurse (n3) HCA (n1) Family Support Services (n1) Doctor (n1) Front of House (n1) facilities (n2) Other (n1)	Patient (n7) Family (n3) Friend (n2)

Table 8-2 Services spent time in (note: many spent time in multiple)

Questionnaires		**Interviews**	
Staff & volunteers	Patient/family/friend	Staff & volunteers	Patient/family/friend

IPU (n30) Day Services (n14) Outpatients (n11) Family Support Services (n7) Not specified (n11)	IPU (n8) Day Services (n1) Outpatients (n3) Family Support Services (n6) Not specified (n1)	IPU (n8) Day Services (n2) Family Support Services (n1) Outpatients Services (n2)	IPU (n8) Day Services (n3) Family Support Services (n1)

8.4 Conclusion

This chapter provided a brief overview of the entire building process, from initiation of idea to realisation. In addition, it set the scene for readers to be able to contextualise findings in relation to the building environment. The interpretation of these transcripts formed the main conceptual themes, as noted in the abstract as (1) fostering resilience, (2) creating thoughtful focus, and (3) engaging in holistic sensory experience. Each is discussed in the following chapter, developed from the analysis of interview data and supported through quantitative data from surveys and environmental monitoring.

Chapter 9
Key Conceptual Themes

There were three key conceptual themes which emerged from the thematic analysis of the interview transcripts: (1) fostering resilience; (2) creating thoughtful focus; and (3) engaging in holistic sensory experience. These themes were generated from interviewing 13 members of hospice staff, seven patients, and five family and friends across the services. It includes text from participants in their own words, supplemented with the researcher's summary of themes and patterns. In addition, direct quotes from participant interviews support and evidence each theme, establishing a real-world connection to the findings and allowing readers to observe how conceptual themes arose. This chapter will present these themes with the relevant quantitative analysis, and discussion weaved in between. Although this might be seen as unconventional practice, it supports the structure of the qualitative analysis in answering the research questions without superfluous data. It also mirrors techniques frequently utilised within architectural methods; described by architect Aalto [1940, p78] as “a combination of technical, physical, and psychological phenomena, never any one of them alone”. The graphs generated from the quantitative data can be found in Appendix 10 which includes satisfaction with various statements related to the environment, Appendix 11 which includes noise level graphs, and Appendix 12a-b which included IAQ graphs.

Although the three themes in this study focus on distinct aspects of the environment that affect wellbeing, they are not mutually exclusive and are intertwined with each other. This was because they were developed in an interactive manner during data

analysis and were adjusted to establish links between themes. Therefore, the presentation of the three themes should be viewed in conjunction with each other and seen as interrelated. This echoes the findings of Zhang, Tzortzopoulos and Kagioglou (2018: 759) who concluded that "people are multi-dimensional and […] healthcare buildings are also multi-dimensional […] one dimension can influence many others, directly or indirectly".

This chapter concludes with the analysis of the POE articles identified from the scoping review in Chapter 4. Detailing the salient and discriminating features of each and their relationship to the novel POE methodology utilised in this study.

9.1 Fostering Resilience

The theme of fostering resilience was found to be the most extensive among the three identified themes in the study. The environment played a significant role in contributing to this theme by providing opportunities for social engagement at different levels while also offering individuals the chance for solitude and autonomy within the space. Importantly, this achieves a sense of familiarity or "home" in a building to which people often possess an existing natural anxiety coming to. As detailed within the literature review, one of the most prominent features of positively contributing towards wellbeing was the feeling of the "everyday" and being supported to live autonomously. The values of hospice care state that the focus should be on establishing a comfortable non-clinical setting to provide person-centred care. This theme was a natural parallel to "social support" in Ulrich's Theory of Supportive Design – in that it refers to building relationships with people. However, it highlights that not only relationships with others but also with the self and the environment form an essential role of a supportive environment. Exploring the relationship between self and environment were prominent features in the following two themes.

There are seven sub-themes evidenced in this theme:

- Space for Social Engagement

- Community Integration
- An Environment of Choices
- Caring for the Carers
- Allowing People to Live, How They Want to Live and Die, How They Want to Die
- An Inclusive Environment that Supports Independence and Instils Confidence
- A Welcoming, Comfortable, and Homely Environment
- Sense of "Home"

9.1.1 Space for Social Engagement

> "your wellbeing is not just about the physical infrastructure of the place, but it's also about the people within it; the engagement with those people, the opportunities to see and engage with those people, the interactions that you have with them, and just the morale of people. They go hand-in-hand … but if the building space isn't conducive to those interactions, then it can leave it a bit more open." – Staff

The building fostered strong relationships among its users based on trust and support. The open-plan layout facilitated daily encounters between users and front-of-house staff, volunteers, facilities staff, and kitchen staff, which contributed to the building's welcoming atmosphere. Non-enclosed staff spaces, such as the reception desk (Figure 9-1) and cafe counter, created a less formal environment than a hospital, making family and friends feel welcome and enabling staff and volunteers to feel accessible.

> "when I'm going there and feeling down, as soon as I stepped through that door and just see all the smiling faces, the porters, the receptionist, the volunteers. As soon as you go in the door, they put you at ease. They know my name and ask me how I am." – Patient

> "we're not sitting at a desk; we're walking about and just making sure "are you okay; are you alright; do you need anything; or are you waiting on someone'. You've got more interaction and just making sure everybody is okay. Even when they come in, showing them the sanctuary, and if you see somebody was upset, you say, "come on with me and have a seat in the sanctuary", because people get embarrassed if they get upset. So, you can

> take them into the sanctuary, and then you would phone down and say, "listen, [this person's] relative is upset, and they're in the sanctuary; they'll be five minutes". So, you're managing and letting other people know where they are - so that they know they're okay." – Staff

Establishing relationships with the broader hospice team throughout the building contributed to people's sense of comfort, trust and even enjoyment within the space. The reception, café, and gardens offered opportunities for chance meetings with everyone in the building, which proved to ease anxiety and provide a sense of being actively or passively involved with others. Corridor breakout spaces (Figure 9-2) contributed to this, good for rest while walking, in addition to offering space for informal conversation: which could build resilience while establishing a connection to the outside, as most of these spaces were designed facing a window with a view of nature.

> "I always had a chat with the chef … I've been downstairs visiting, and if someone else comes as well, we would say "we'll just have a cup of tea in the café" and have a bit of banter with the chef that was there." – Patient

> "you could sit outside the chairs in the art room, and you would see families in the nook, and you see families maybe just taking a bit of time at the top of the stairs to the IPU, and an older couple sat in front of the fire near the café." – Staff

The Day Lounge afforded patients time to socialise (Figure 9-3); being in a similar situation enabled people to empathise and relate to one another. For staff, shared offices established a supportive and safe environment for informal discussions among colleagues on difficulties, working through problems, and fostering new initiatives.

> "When you met your friends there with different cancers, when I was at home, I felt as if I was alone, but when I was there, you see other people's problems and can have discussions. You felt there's a reason to carry on now." – Patient

> "it's about feeling valued, and we are coming into a nice clean, bright space. We've all got lovely new chairs, we've got new desks, we can see each other, we've got our own kitchen that we can go and get yourself tea … we are

> going to be working with people who are distressed, who are bereft, who are frightened and there is often a lot of child protection an adult support protection concerns. You're working with people, and what you do with that interaction with them can be a bit of a minefield because you're there to build a relationship to help them with their grief, but you might then have to go and make a call to social work. So then, to be able to once you've had a session or once you've finished working with them. To be coming into a [shared office] where you feel safe for yourself and your own space and can sit with your colleagues and go, "I've just had a difficult session there, I think I'm going to have to…" and you're all together, and if appropriate can have a discussion about where I am going to take this […] it's good to bounce off each other rather than being somewhere that your Individual and very isolated." – Staff

9.1.2 Community Integration

The PPWH always had strong connections with their local community at Carlton Place, and prior to the move, staff felt establishing strong relationships with surrounding organisations was extremely important. Cornerstones to community integration at the new facility included having a public café, various outdoor spaces and an Education Suite with bookable spaces for internal and external events.

> "The walking group is being done in collaboration with Glasgow Life, that's the sports centres. That fact that [Macmillan] Improving the Cancer Journey is now using this space, that fact that we are in negotiation with the Community Council to use this space to have their meeting… I would say yes, we are integrating into the community." – Staff

9.1.3 An Environment of Choices

> "I think the fact that they've got the option, the choice: they can be included or not included as they want, and some people even just like … sitting there and they like just listening to the chatter going on round about them. They don't have to be involved in it; they can just sit quietly and listen to it and observe but without feeling left out." – Staff

The building offered a range of choices to its users, tailoring the environment to suit specific needs and preferences. The layout of the building played a crucial role in achieving this. Multiple exits permitted those who were upset or vulnerable to take a private route, evidenced in the self-contained Family Support Services Area on the

ground floor (Figure 9-4) and the Berry Suite layout. In addition, there were rooms for private or difficult discussions located off, but not apparent from, main circulation routes such as the sanctuary, informal breakout areas, counselling rooms and garden rooms. Having rooms dedicated to these conversations meant people did not have to re-access these spaces if they did not want to. This means they will not have reminders that might negatively influence their perception of the environment as a whole. These rooms often had focal points and created novel experiences, facilitating effortless attention which allowed the focus and processing of thoughts. They took the form of expansive views of the outside world to achieve feelings of immersion in nature, or discreet, slim windows that framed a particular view or created dynamic lighting conditions.

> "I like where our rooms are. It's very easy for people to leave and be straight out, they don't have to walk through… a busy area" – Staff

> "My sister and I … used the sanctuary, and that was lovely. Just for an exchange of what's happened, where are we…"– Family/friend

> "You would have the garden area [for a private conservation]. I never went into the garden room, but I'm sure if you wanted a private conversation, you could go in there. The room itself was comfortable enough to have conversations. Even the café because they had private booths." – Family/friend

Space for time alone allowed people to sit and reflect rather than feel rushed out of the building, which was critical when people felt overwhelmed. This was not only provided for those accessing the services but for staff and volunteers, who had access to dedicated space, which contributed towards resilience and allowed for a refreshing break without feeling "on demand".

> "If you need some of the staff to speak to, they could organise that, but if you just need some quiet time. You can even take a book in. Even if you just want to sit in there for quietness and there is a window. They've definitely got a space for that." – Patient

> "they have a choice, and I have said to [people], there's the sanctuary there if you need some time, you can go and sit over there. There's the café if they

> need to go and get a cup of tea or a drink of juice, or they can sit in the seated area at the kitchen" – Staff

The Day Lounge's layout, with its dividing wall and grouped furniture, created zoning and enabled the running of simultaneous activities. The openness of the space also facilitated people feeling included in their surroundings while not feeling compelled to be involved. Additionally, the multipurpose room's proximity to the Day Lounge allowed for large sliding doors to open and create an extension to the Day Lounge (as shown in Figure 9-5). This sliding wall was also a feature in the training room, enabling the creation of two separate private rooms or a larger room, depending on the need.

> "I love that it's got three different areas … it's got the multipurpose area that doors can be closed off from, and then Day Services itself splits into two areas. So, you could host two different groups, even within that. It gives loads of opportunities, and it still got a bit of outdoor space as well" – Staff

> "the staff are first class… they try and get you to do things and make things, which is great, but if you don't want to at all, you can go and sit in one of the big chairs and adjust them to whatever suits yourself. They make you feel very welcomed." – Patient

The counselling rooms within Family Support Services (Figure 9-6) could be viewed as having a "fixed" layout. However, staff members acknowledged that it is not only necessary for spaces to be adaptable but to maintain consistency. Management staff were knowledgeable about the building's layout, down to the placement of cushions and fire hydrants. Keeping this consistency allowed people who accessed Family Support Services to feel comfortable as they became familiar with the room; almost forming a sense of belonging and connection to the room itself. However, the rooms were adaptable to meet specific needs, with furniture that could be easily removed and stored in a nearby cupboard. The rooms also provided choices in seating, lighting, and heating, which allowed individuals to make decisions based on their comfort levels and promoted confidence and empowerment.

> "there are some people that do like [a room with no window] because it makes them feel safe… it's more private. It goes back to personalities and

personal choice of what people like and what they don't like." – Staff

> "there are couches in the rooms … that's actually beneficial for clients who like to be sitting side by side. Some people don't like eye contact, and sometimes part of the therapy is just having somebody sitting beside you. It's a real plus … it's good they have a choice. The client can lie down on the couch and put a cover over them" – Staff

The bedroom had controllable features (Figure 9-7) to suit people's preferred comfort levels, from temperature to light levels. Blinds and operable windows control light level, glare, temperature, and ventilation. Dimmers controlled the majority of artificial lights on individual room panels, or in larger spaces, requests were made to those in charge of the central control room to alter the temperature. The requirement for artificial light during the day was limited due to the abundance of natural light. However, even when on the artificial lights often went unnoticed because of the indirect, soft lighting. In shared offices and meeting rooms, people had varying preferences over temperature levels, so not everyone was comfortable all the time. However, staff acknowledged this was because of personal preferences rather than controllability.

> "when the sun is out at dinnertime, we sometimes have to draw the blinds. Just to keep the sun from dazzling you. If you're facing the window, sometimes you can struggle to see if the sun is in your eyes, but putting down the blinds manages that." – Patient

> "it's probably staff who determine what Lux is coming out, even in all the [Family Support] rooms and places like that, it's all dimmable lighting in there; the sanctuary, the café, the staff dining room, the staff lounges, the meeting rooms… so that's all dimmable, allowing you to set the mood lighting in each space" – Staff

> "You're never going to please everybody: sometimes you can walk into the office and go "it's freezing in here", but they go, "oh, I'm roasting". Most times, it's a happy medium. It's the same with the lights…" – Staff

During the warmer months, the environmental conditions occasionally became unmanageable in the offices. However, having personal level of control over the environment allowed these to be accepted and adapted to, blaming external

conditions and not the building.

> "it was quite hot in the summer. I've got a fan on my desk now, which I wasn't necessarily expecting but my office, in particular, was warm and the window only cracks a bit, rather than opening completely … given that it's Scotland, that was about a week, in the grand total of the year. It wasn't a major deal, but my office was a little bit warm." – Staff

9.1.4 Caring for the Carers

> "The staff that I did meet were all in the right job. They were all very welcoming and informative if you needed any help." – Family/friend

As well as supporting the wellbeing of patients, the PPWH contained areas that supported the wellbeing of the care team, including staff, volunteers, and families. PPWH staff had always advocated for dedicated family space and therefore it was a key design consideration in this building. The garden rooms (Figure 9-8 and Figure 9-9) were the cornerstone to this, which many rated as their favourite space in the building. It was often used for difficult conversations, the room's interior design mirrors the outside environment using timber cladding, a planting wall, and soft green tones. This place was also envisaged for gardening activities with dedicated drainage, double doors opening to the outside and a nearby garden store.

> "they've got [dedicated family areas], and they've noticed it. They feel more relaxed." – Staff

> "I could have stayed in the family unit overnight, and that's a nice thing to be able to do. Having your own space but knowing you were nearby if needed. If you would actually be sleeping in the room and there all the time, you might feel that you have to get away sometimes." – Family/friend

> "I wasn't able to have that kind of [difficult] conversation with my older sister. We did actually meet with one of the doctors in one of the garden rooms." – Family/friend

> "[the garden rooms are] lovely, seeing how the plants are used as a room divider that's not just pretty. It's not just pretty but bringing the outside in." – Family/friend

Families frequented the social space (Figure 9-10) to wait while patients received personal care or while others visited. It allowed for informal meetings between families, forming connections and relating to mutual experiences, increased social support, and built resilience. It was an area that provided a dedicated and comfortable space for families and friends, compared to waiting in hospital corridors or transient areas.

> "See if somebody comes to visit, and we are going in to do personal care, and we asked them to sit outside. They'll all sort of sit and gab there, and it's a nice place for them to be. In the central spaces in the ward, you see families sometimes congregating and sitting" – Staff

> "It looked as if [the central space] was open for anybody to use, really. It didn't look as if it was just for the patients. It looked like that was the reasoning behind it because there were lots of chairs, and they're nice and comfy. Everything was welcoming. You just felt you could use it without even asking." – Family/friend

The building offered a pleasant environment to work for staff and volunteers. Staff felt they worked in a healthy environment, with well-planned interior design and designated staff areas. This allowed them to feel valued and have space for personal time or socialising, which contributed towards building resilience.

> "it's good health-wise, environment to work in, and they take care of staff with the wellbeing program as well and healthy living. So, they do all that and support the staff with the healthy living and yearly training and inductions. So, they support the staff that way and have regular meetings for the staff and let us know how you're getting on." – Staff

Figure 9-12 indicates typical walking distances over a 12hr dayshift. The staff in the PPWH IPU averaged 12,657steps (5.73miles) over six 12hr dayshifts and 8,453 (3.83miles) over one 12hr nightshift; the highest number of steps during a 12hr dayshift was on one of the Saturday shifts at 15,766 (7.17miles), and the lowest number was on a Sunday at 9,844 (4.46 miles). There were no concerns over walking distances, as the self-contained units had all the required supplies for a shift. The self-contained nature of the layout allowed staff to stay in the same vicinity as patients and families, even if just visually.

> "the six bedded area, and the ten bedded area, both areas have got the exact same: they've got a bathroom each, they've got a sluice each, they've got disposables, they've got a garden room, they've got a garden store. What we wanted to do was to make sure staff weren't having to walk any further to get materials to carry out care." – Staff

The decentralised nurses' stations consisted of tables and chairs in the central space of each unit (Figure 9-11). This open plan layout, coupled with the informal nature of a dining table workstation, seemed conducive to building strong relationships between patients, families and staff. Allowing an establishment of familiarity that can contribute towards building trusting relationships and allowed for staff to feel more accessible. Although, the overwhelming majority stated the benefits of this layout, it is important to consider one comment that a staff member was concerned families might perceive them as not working when typing notes on laptops, owing to the informal nature of the space. In addition, they sometimes felt their work, requiring concentration, was interrupted due to being so easily accessible. It should be noted that there are individual workstations within each bedroom, where comprehensive notes can be taken in real-time. Although as the internet signal was variable, staff often had to connect laptops to ethernet cable in the central space, meaning they would be capturing this after being in the privacy of the patient's bedroom. In addition, there were other private staff only spaces that could be used for these tasks.

> "unless you go into the duty room, then you've not got the privacy to do notes. I had three sets of notes to do, but I was getting interrupted, [and] it took longer. I don't think relatives realise you're sitting there working because you're in the middle of the ward… they will come up and say "such-and-such needs", and I think they don't actually think you're working. They maybe think you're sitting on the computer looking things up, but you're actually doing notes… to be fair, we should be doing them in the rooms, but the Internet connection isn't the best." – Staff

The central space in the IPU received natural light from skylights and borrowed light from the bedrooms (Figure 9-13). This filtered lighting created a calming and relaxed atmosphere. A few staff perceived the levels as slightly too low, only after they spent

prolonged periods – which could lead to lower energy levels. Although the area was a transient space, this feeling could arise as staff spent extended time in the space due to requiring a stronger internet connection – as mentioned previously, tasks that would be completed ordinarily in patient bedrooms were done in this area instead. However, there was acknowledgement that the rest of the spaces staff had access to had more than substantial levels of natural light and views of nature – which they had unlimited access to throughout their shifts.

> "I feel you go home from here more tired, and I don't know if it's maybe the stone floors because we're at ground level. When we're down here we don't see anybody and see in the winter - it's dark when you come in, and it's dark when you go." – Staff

> "the office has a big window; there is lots of natural light. Then coming out into the main central area, we've got good natural light there and then in the individual patient bedrooms. There's quite a bit, I think, there's maybe not quite so much in the central areas, but in each of the rooms there's the windows in the space" – Staff

> "I wasn't aware until you showed me these pictures that there were these skylights above [the IPU…]. I can't honestly say I appreciated that at the time, maybe because it was winter, in summer it might be different." – Family/friend

Measurements of CO2 levels in the central space showed consistent good indoor air quality, staying below 1000 PPM and even reaching below 400 PPM (i.e., good outdoor air quality) for 6% and 24% of the day (8 am-10 pm) and night (10 pm-8 am) respectively (Figure 9-14). However, staff members perceived the central space to be less ventilated, possibly linked to the previous comments on the lower lighting levels or lack of access to views from windows. This perception was supported by comments that the winter months could be more tiring.

> "I don't know how to describe it, but [the central space] feels quite claustrophobic. Although it's a big place, it can feel quite claustrophobic, as in air wise" – Staff

> "I just feel like no fresh air gets into the place. There is very seldom a window open unless a patient requests it, and most of our patients would feel

cold" – Staff

9.1.5 Allowing People to Live, How They Want to Live and Die, How They Want to Die

"she had a choice of how she wanted to live, and she didn't want to live in bed" – Family/friend

The space was designed to be accessible, which enabled people to maintain their independence, something that may not have been possible in their home environment. The interior design and layout included accessibility aids that provided support while still allowing for autonomy, enabling people to live independently in a safe environment for as long as possible. Additional layers of support, such as remote-controlled access to room features, integrated ceiling hoists (Figure 9-15), and even the ability for oxygen to reach the ensuite easily, allowed people to adjust to the environment at their own pace instead of feeling disempowered by having their choices taken away and having everything done for them. However, the lip on the doors to access the outside was identified by staff as needing further consideration and was under review by management. Although not a trip hazard or a high step, it could be challenging to move a bed over.

"She wanted to sit up, and she was in a chair up until about two days before she died. She always thought if you stayed in bed, it was never a good thing for an older person to stay in bed too much. We always had to persuade her to rest. It was important for her to be able to sit up in a chair; if you call that independent, I don't know. But she wasn't lying down; she was sitting up. She was able to do sudoku or read a magazine... She was able to do all these things…"– Family/friend

"she very, very quickly deteriorated, and so she needed support a lot of the time. She was a very independent person, but she couldn't stand up unaided. The ability to do this left her very quickly. Her core muscles seemed to deteriorate quickly, and she wasn't able to support herself well. She could eat, she wasn't hoisted at all, so she was able to transfer between the bed and the chair well enough, as long as she had support. When you say how much independence she had… it depends on your level of fitness, and that deteriorated pretty quickly. She was still able to eat herself; she didn't need any help with that, and initially, she was able to go to the toilet

> independently. She was on oxygen all the time, and the oxygen cable was long enough, so she was able to do that. She wouldn't have been able to do that in the hospital, where there wasn't an ensuite." – Family/friend

> "what we were told was that the beds can be wheeled out onto the patio area, it can be done, but It's very difficult because there is a bump, but again that's just a minor thing; if it was really important to the person you would find a way to do it" – Staff

No matter fitness level or frailty, the grounds were fully accessible. The design extended to the accessibility for bedbound patients, even down to the curved pond path designed to accommodate the turning circle of a patient bed. Maintaining independence for those requiring additional support was achieved by incorporating subtle accessibility aids, such as the timber railings (Figure 9-16) for the path leading down the seasonal gardens to the pond.

> "[accessibility of the outside is] quite good because, again, we took into consideration wheelchair users. So much so that even going down the seasonal gardens, we made sure you could take a bed down there. The pathway that goes all the way down there can take a patient bed." - Staff

> "I'd imagine the handrails [either side of the seasonal garden's pathway] would have a usefulness, it's a nice thing because there's a lot of people that don't like to use a walking stick, but a handrail would give them the option of doing without that while having a bit of additional support. It's a good idea, I would think, and they weren't intrusive… I could see it would be really useful for a relative that I know who doesn't like to take a walking stick, but they're kind of like an understated way of somebody having a support there, that they could do with, but it's there for everybody to use and it's kind of integral. It's not in your face "look, I am an accessibility object here". It blends in nicely with the garden." – Family/friend

> "I would also say that all the paths are very flat and … there are two separate bits and like a little gulley running up it. There is a natural separation there. If somebody is coming towards you, you're on one side in they're on the other" – Family/friend

Young adults were a minority group within hospice care, often having unique needs not adequately met by paediatric or adult care services. Peer engagement and the

utilisation of connective technology, such as social media, can often play a crucial role in the lives of patients who may feel more isolated due to frequent appointments or symptom flare-ups that require time off school or prevent them from attending social events. Recognising the importance of this often overlooked group, the PPWH considered their needs when designing the new facility by incorporating dedicated spaces to meet and support them, as well as establishing a supportive peer network.

> "I see much more young adults want to come here because the building itself lends itself to being much more accessible." – Staff

The environment provided several ways to empower and offer a sense of control, especially in bedrooms, as they were often even more customisable than a home environment (Figure 9-17). For example, a bedside remote controlled temperature, lighting, TV, bed position, and curtains. There was manual control over the curtains, doors, and even the room layout, with furniture not being fixed. Lighting was an essential aspect of the environment; its adaptability was utilised to support different needs and help create specific atmospheric conditions. Artificial lighting included lamps, wall lights, and controllable overhead lights (Figure 9-18), which allowed patients and families to alter conditions to suit their preferences or needs, whether this was strong bright or softer light.

> "patients have remote controls for electric blinds, electric curtains, the lighting, the heating -they can adjust the heating and lighting to suit themselves in each individual bedroom." – Staff

> "all the buttons were there, she could control whatever angle she wanted her bed, and everything was reachable for her." – Family/friend

> "The light pads are an excellent idea because it is very easy to adjust lighting. My wife has a visual impairment, so it really helped her when we stayed in the family rooms or when in the garden room areas." – Family/friend

> "there is plenty of natural light, even though the [bed]room is deep, there is enough natural light to go through the space. Maybe if you were reading a book, I didn't even need it then, but there are lights there." – Family/friend

With brightness being a common complaint in healthcare environments, here, the

public and patient areas emulated homelike conditions, with artificial lighting often going unnoticed. However, the staff commented that lighting within the IPU reception could feel "too bright" without controllability over this, perceiving that families might feel under the spotlight.

> "The interior light they had wasn't overly bright. Sometimes you go into the hospital, and you've got to adjust your eyes to the light because it's so bright. Obviously, the type of lighting they had; they could control it to keep it minimal. Enough for you to need, but not overly bright." – Family/friend

> "Lighting [is] too bright needs more lamps for the evening, Reception area too bright in the evening. [It] would benefit from under lighting on units and standard lamps to soften lighting, making it less stark for families when they are feeling upset. I feel as if families may feel that they are walking into a spotlight when really it should be a more tranquil area in the evenings." – Staff

9.1.6 An Inclusive Environment that Supports Independence and Instils Confidence

> "Safe, I feel safe. I feel inspired, and I honestly really, really look forward to Wednesday... There's always so much happening; it's something I look forward to" – Patient

All entrances were accessible with level thresholds. The main reception entrance door was domestic in scale and operation which established a less clinical experience, with meet-and-greet volunteers opening the door for everybody, ensuring inclusivity. There were automatic doors at the patient entrance for those who frequented the building and prefer more independence. A myriad of accessibility features were integrated into the interior design, from the ceiling track hoists to the additional built-in support to seating, which provided people with the right level of support for their needs but also not "standing out'. Seating styles, from homely couches to higher chairs with armrests for easy manoeuvrability, did not just suit accessible needs but also accommodated preferences and choice for everyone (Figure 9-19). The flexibility of the furniture layout allowed for adaptability to suit various conditions and activity requirements.

> "There are meet and greet volunteers at reception that will open the door for anyone entering the building and keeps it feeling inclusive. It is a level threshold. There is a more accessible side entrance with automatic doors that will be active when patients are coming in for Day Services." – Staff

> "we've been approached by different organisations to say that our accessible toilets, there so huge, the one in Day Services that's got that ceiling hoist, could we advertise that we have that space. So that when you're through the park, and actually they need a changing place, it's not quite a changing places toilet, but it meets quite a lot of that requirement. They would be really keen that we advertise that as publicly accessible for those who need it. That's a real positive thing." – Staff

> "There is a variety of seating throughout the building that offers choice and can be suitable for different needs without looking like the chairs have been altered. Chairs can be specifically brought in if required." – Staff

The environment helped support and empower people to regain confidence that might have been lost in their daily life; offering opportunities to re-engage with their abilities or develop new ones. The art services seemed to be an integral aspect of relaxation and focus, offering a sense of purpose and fulfilment while getting lost in creativity. Patients who took part in producing a physical object, such as paintings, had considerable pride in their work, often inspired by what they and others around them could achieve (Figure 9-20).

> "Absolutely, [it gave me back my confidence]. At home, anything I used to do, I leave my wife to do now. I used to have confidence and could do anything on the computer, but now, I question myself. Everything that I dealt with, my wife deals with now because I'm not 100% sure of myself. It's a weird feeling. I get a lot of depression, but I work myself out of that. I still like to do a lot about the house. Look, they got me into doing art. – Patient

> "I did photography a long time ago. When I went there, there was an opportunity to join the art class, and part of that was photography. So, I took that up again. – Patient

> "Have you seen my work up? It's hanging in the art room. You go into the art room and turn left, and it's right down at the bottom. Unless they've sold it and made a million!" – Patient

> "There is one patient in particular, over the spring, summer, and autumn last year has been out, where he can and been photographing our seasonal gardens to photograph the progress of the season's changing and the flowers in bloom and the colours and things … the art room are going to do a display of all his work, and then his family can come along to it, which it's lovely. That … gave him a project to do, something a distraction, something to focus on and feel like he's got a purpose again and then look at this end results: he's going to have an art gallery display and show his family. His family are so proud of him that he's actually, despite his illness, despite his age, despite the fact that he is heading now for end of life – he can actually still achieve something. So that's been very good." - Staff

9.1.7 A Welcoming, Comfortable, and Homely Environment

> "we just need to keep doing the best we can for patients… and make them realise that this is for them. This is their place; they tell us, we don't tell them. It's not about us, it's about them, and that's it, keeping them right and happy." – Staff

The building's aesthetics were interpreted in subjective ways. However, all had positive connotations to the building, with it feeling intriguing and / or safe. The first impression of the building for many was that it was peaceful and projected a welcoming atmosphere. The cornerstone to this was the reception, with its open plan desk, and staff and volunteers standing rather than seated, having a choice over comfortable seating areas, and even the option to go straight through to the café. The front door being domestic in scale and operation established a less intimidating clinical appearance than a standard healthcare building, something important when many can feel anticipatory anxiety coming to a healthcare environment, often not there by choice.

> "I came through the park to it, and I thought it had quite a church-like feeling about it when I was coming down the hill towards it. For me, it was quite a peaceful thing because I always associate churches with ... a safe place, I would associate it with an interesting place." – Family/friend

> "it feels warm and welcoming, and the rooms feel comfortable, and then you've got the staff on top of that" – Patient

> "I'm equally sure there are some families that won't even notice it, d'you

> know, because I suppose I would still say that buildings are buildings, and it's the care that's given, and I don't think we should ever lose sight of that, but the most important thing is people feel cared for beyond a building, and people will let you away with a lot, and I've cared for people in the most awful of spaces, but if they really feel like they're being really well cared for, I think that it absolutely contributes to a lot of peoples wellbeing, but it's not the only thing that contributes to it." – Staff

When people experienced difficult emotions due to symptoms, the building allowed for relaxation, and symptoms could almost be forgotten during their time there. Many used words such as "peaceful" and "relaxing" to describe the space (Figure 9-21). The provision of space to offer complementary therapies (Figure 9-22) seem to be one of the most beneficial aspects contributing to feelings of relaxation.

> "[I feel] total relaxation [in the building] and all these morbid thoughts that I can have, that I'm just about to pass away or that this thing is just about to explode in my head. I have a lot of headaches, but when I'm there, nothing. It relaxes you that much … it's weird because when I'm at home, I have to sit down and relax. If I lay down on the side of the tumour, the headache goes away." – Patient

> "When you get [reiki massages], it's absolutely fantastic. That just totally relaxes you; it takes about half an hour, and when you get up, you just about float out the door. You've got absolutely nothing on your mind." – Patient

The environment offered people a chance to reflect on positive memories or experiences. Some even turned a negative experience of art creation in their past into a positive one at the hospice. The hospice had a dedicated Art Room with staff focused on developing individual interests, resulting in many being inspired by past experiences or hobbies. In addition, neighbouring businesses and donating organisations' plaques triggered fond memories when in the hospice, providing a positive connection to the environment.

> "they make it look, if you want to say, nice and Scottish - you know it's got that feel about it with the heather colours and that. Again, some people maybe won't like it because it depends on individuals' tastes, but anybody that comes in, anyone that we've met and even external groups, when they've come in, they've commented straight away on how lovely it is, and we get a

lot of feedback at that front desk about how lovely it is, that people have been in awe about it all." – Staff

"The story behind the art class, when I was in school, I hated art. I would cause trouble and be sent to my form teacher, where I'd take 2 or 3 of the belt, and I missed art. But see now; I love art!" – Patient

9.1.8 Sense of "Home."

"[it] gives me a good feeling, in comparison to going to hospital." – Family/friend

Many of the freedoms associated with a home environment were achievable in the IPU. For example, the bedrooms offered a sense of "home" for many. The ability to have multiple visitors, flexible layout, comfortable furnishings, adjustable levels of privacy, and direct access to outside contribute to people feeling they were visiting somebody's home. Even calling the patient rooms "bedrooms" positively affected the perception of home within the environment. Sofa beds offered a comfortable option for people to stay in the patient bedroom (Figure 9-23), with nearby family rooms provided additional space for people to remain in their own environment.

"The bedrooms are wonderful, and it is fantastic that they are called bedrooms and not rooms. The bedrooms make for a homely environment and are really comfortable. They contribute hugely to the sense of peace and help make the time spent there more relaxing than it would be in somewhere like a ward environment." – Family/friend

"[the bedrooms] are very comfortable, peaceful places. The lighting and temperature levels are just right. The inpatient, family rooms and lounge areas feel very homely. The hospice environment is calm, and it enabled me to spend the best quality of time with my dad because I could feel as "at home" as possible." – Family/friend

"Sometimes, if my mum was sleeping, I would sit away from her, so being able to use the sofa was useful, being able to have a chair and sit beside her and when she became more ill, being able to sit beside her and hold her hand." – Family/friend

"It was great for the family. There was plenty of space. There was a sofa that turned into a bed, which meant that her family could stay overnight with her.

> It was a good size; it wasn't claustrophobic." – Family/friend

The family dining area (Figure 9-25) was another space that established a sense of normality. Patients and their families could come together and enjoy a meal with access to cutlery, dishes, and other kitchen facilities. Moreover, the circulation route to both units did not feel rushed and had a sense of comfort, even feeling "zoned" by the change of floor covering and access to a window. Access to the family dining area ensured patients, family, and friends had unrestricted access to kitchen facilities, offering the opportunity to prepare drinks or food at their leisure without feeling they were burdening staff.

> "I've seen families who are staying maybe get a takeaway, and they just all sit round the [dining] table, and underneath there are dishes, everything is there – everything they need. They can just get the dishes and just sit and be sociable." – Staff

> "when I first went down, the nurses said just help yourself to tea, and there is hot water on tap, teabags and sugar. You just made your own and cleaned up after yourself. I felt it was great because it meant I could make Margaret or myself a cup of tea without thinking I was bothering anybody. A lot of the time at the hospital, you're desperate for a cup of tea, but you don't want to say to anybody because you know they're busy with other things. So, the fact that you could do it yourself is fabulous." – Family/friend

Direct access to the outside from the bedrooms allowed the unrestricted visitation of pets, which had minimal disruption to surrounding patients or families. This established a homely environment, acting as the back door to let your dog into the garden. This contributed positively to wellbeing, as interaction with pets brings comfort and distraction, providing a sense of normality that a human visitor might struggle to emulate.

> "When they came to visit, they brought the dog as well, which Margaret loved. It was great because it took her mind off things. You know what dogs are like; they're jumping up on you and excited. They don't care that you're sick, making it probably more normal than us visiting. They just don't get it." – Family/friend

There was a balance between the need for a safe, clinical setting and providing a

comfortable and homely space. In the bedrooms, the clinical areas were located on one wall, with built-in storage that kept the main space clear and uncluttered. In addition, there were distinct zones for activities, which providing space for everyone in the care team (Figure 9-24). The IPU, throughout, integrated medical equipment, such as oxygen tanks, into furniture (Figure 9-26), detracting from being of prominent focus as they might be in other healthcare settings. This brough a normality to the space and allowed people to feel at ease. That also allowed casual visitors, who maybe had limited knowledge or awareness of someone's condition, to feel at ease and make them comfortable enough to visit as much as they wanted, rather than a hospital environment that might deter visitors. In addition, it allowed patients' medications and clinical equipment to be stored in the room, providing easy access and autonomy for patients and families over medication use. There were tables and display shelves within the rooms for the use of patients and families.

> "you've kind of got this middle ground here, where you've got the clinical stuff that you need from a more clinical environment, but you've got the homely stuff that you need from a home environment, so it meets them both." – Staff

> "It's a very homely atmosphere. There's a fridge there for individual use, that's really nice because you know normally if people are in hospital, you might take stuff in, but there's not really anywhere like that to store it, and if you maybe wanting something cold, something that you fancy that's been brought in for you. That's nice… The other thing that was quite nice was the back of the bed. We were able to put up cards and so on. It might have been nice for her to be able to see them, they were right round the back of her, but she had read them, she knew that they were there, but I don't know if that might have been something, you know to have been able to look at things might have been nice too. She could see them if she was sitting up in a chair." – Family/friend

> "Even coming out and to the family dining area was welcoming. Even before you got to her room, all these nice comfy seating areas. It was nice to be able to see that, rather than just nothing or all equipment which you would see in a hospital." – Family/friend

> "I definitely felt comfortable visiting her because if I didn't, I wouldn't have

> visited as much as I did. I felt it was a really nice environment for myself to come and visit. It didn't upset me the way it would have if she were in a hospital. That was nice, with respect to friends and family visiting. The family felt that as well; they felt comfortable enough to go in and spend time with her and have dinner with her. It was like their front room. When I was there, her family were always there. It was like going into her front room. Apart from the fact she was in her bed, the environment allowed [her family] to keep it quite normal for her." – Family/friend

One of the most significant contributors to feeling comfortable and positive about visiting someone's private home was that the bedroom spaces did not feel "invaded" by staff. Although a visual connection remained between the bedroom and staff space (Figure 9-27), it did not feel invasive. If staff were difficult to locate, they responded quickly to buzzer activation, or there was always the reassurance somebody would be at the IPU reception.

> "The nurses were there, but they weren't in your face, and they weren't walking about with uniforms on. Like they would do in a hospital. When you're in the hospital, I think you're very aware of the fact that you're in hospital and you're interrupted constantly with different things. Whereas in the hospice, that wasn't the case. I could have been there the whole visit and not seen anybody, other than if Margaret wanted to send for the nurse to give her medication." – Family/friend

Figure 9-1 Open plan desk in reception area.

Figure 9-2 Corridor breakout space.

Figure 9-3 Various areas for socialisation within the Day Lounge.

Figure 9-4 Direct exit from family support area.

Figure 9-5 Diagram showing the zoning and separation within the Day Services Lounge.

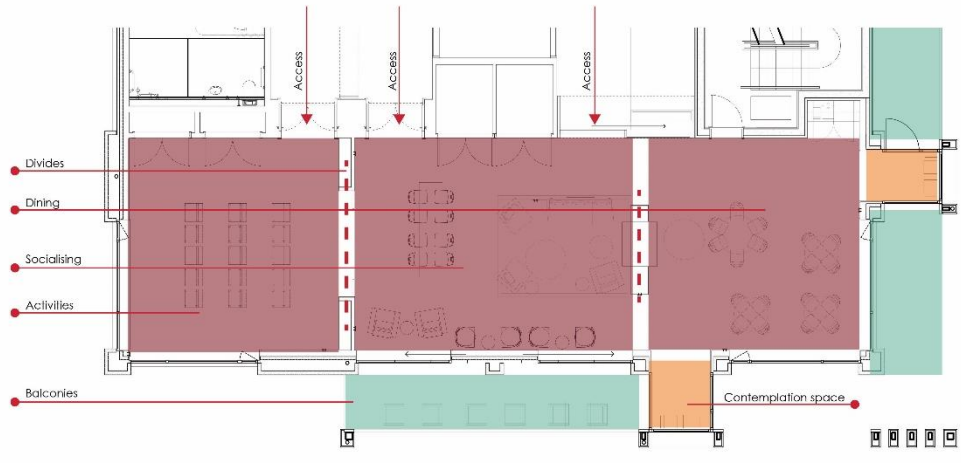


Figure 9-6 Family Support room with similar décor but different features.

Figure 9-7 Various levels of privacy can be achieved within the bedroom to suit.

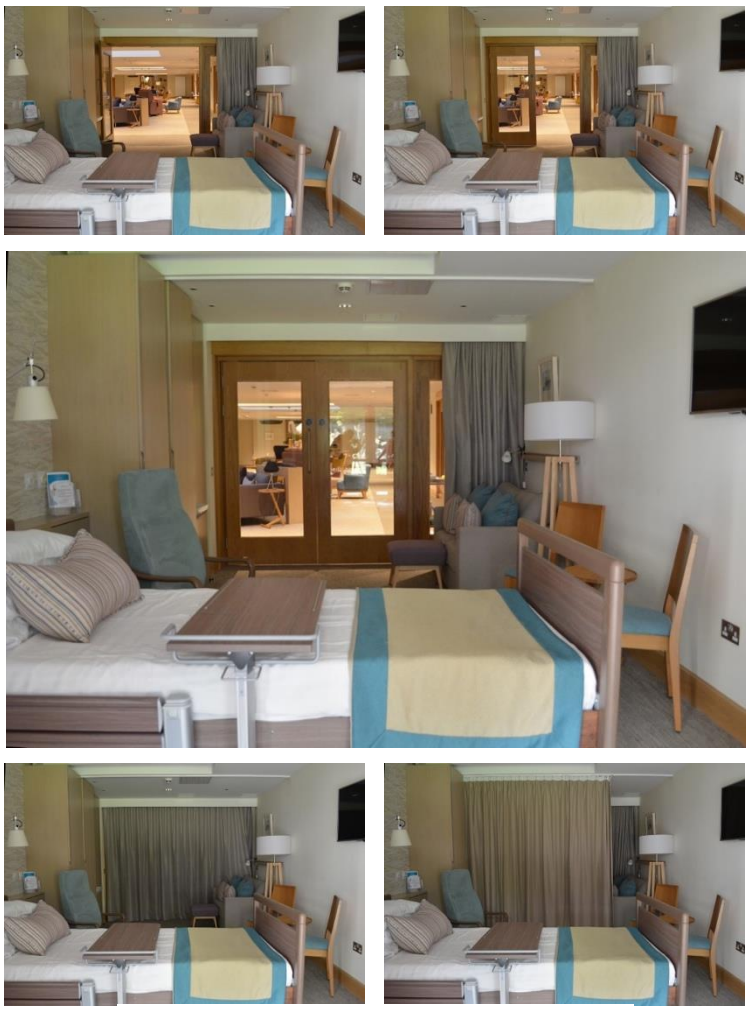


Figure 9-8 Diagram showing garden room location in relation to unit layout.

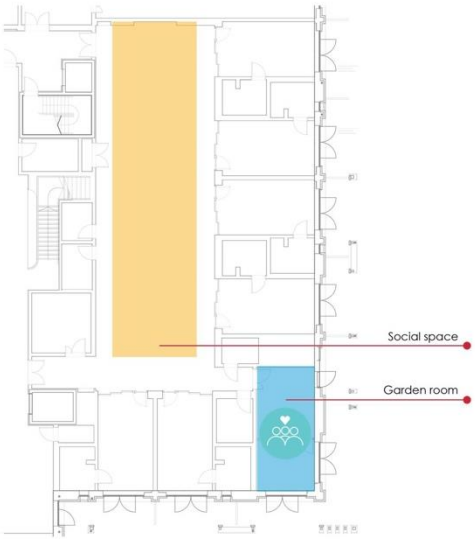


Figure 9-9 The outside-in interior of the garden rooms.

Figure 9-10 Unique and comfortable furniture in the central social space.

Figure 9-11 Open plan desk in the centre of the social space acts as an informal staff working area.

Figure 9-12 Walking distance of IPU staff over a 12hr dayshift.

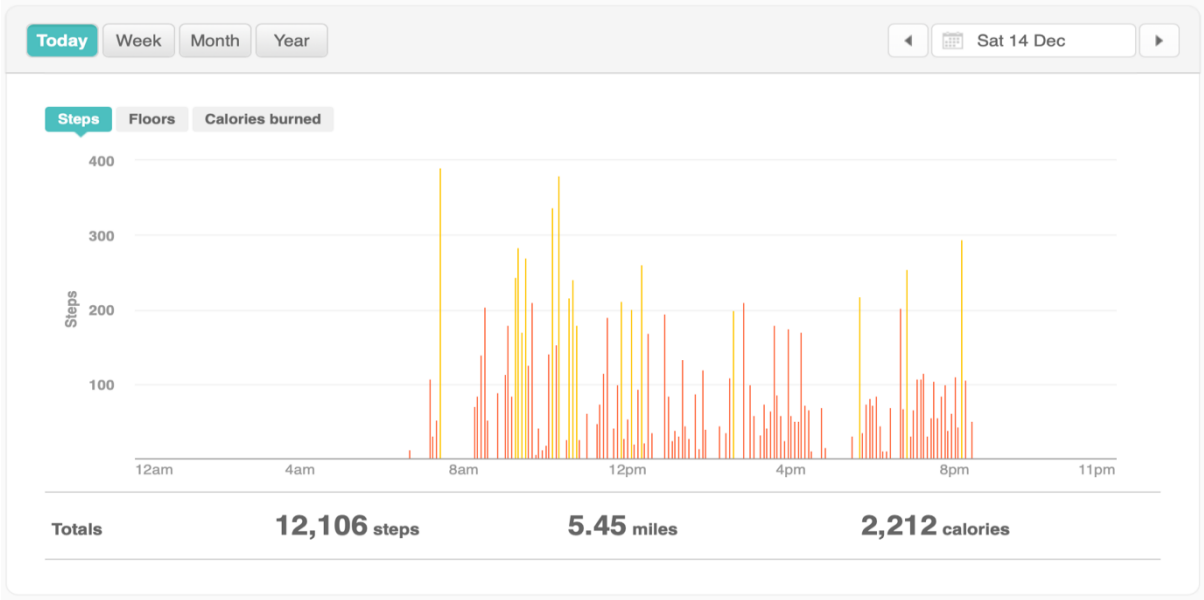


Figure 9-13 Skylights and artificial lights in social space.

Figure 9-14 Graph showing CO2 levels measured within the unit central space over a 24hr period.

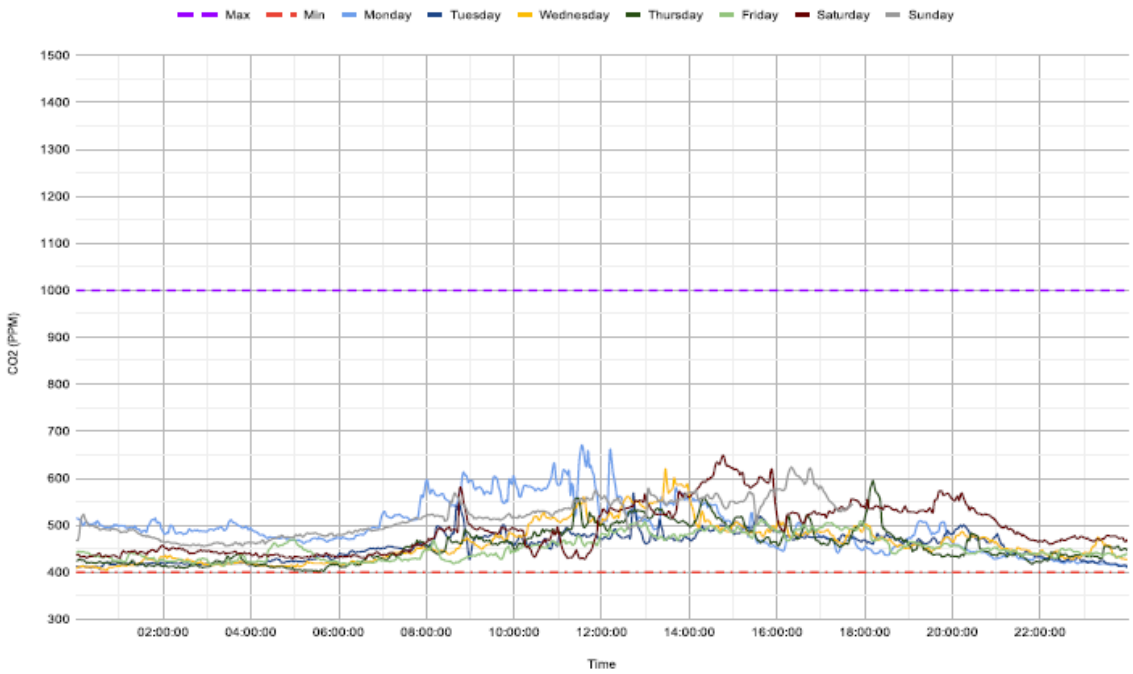


Figure 9-15 Integrated hoist concealed within the ceiling design.

Figure 9-16 Timber handrails lining the pathway, acting as a subtle accessibility aid.

Figure 9-17 Accessible seating which blends in with the rest of the décor.

Figure 9-18 Controls integrated at the bedside.

Figure 9-19 Various lighting conditions can be achieved within the bedroom.

Figure 9-20 Gallery beside patient side entrance that had patient work displayed.

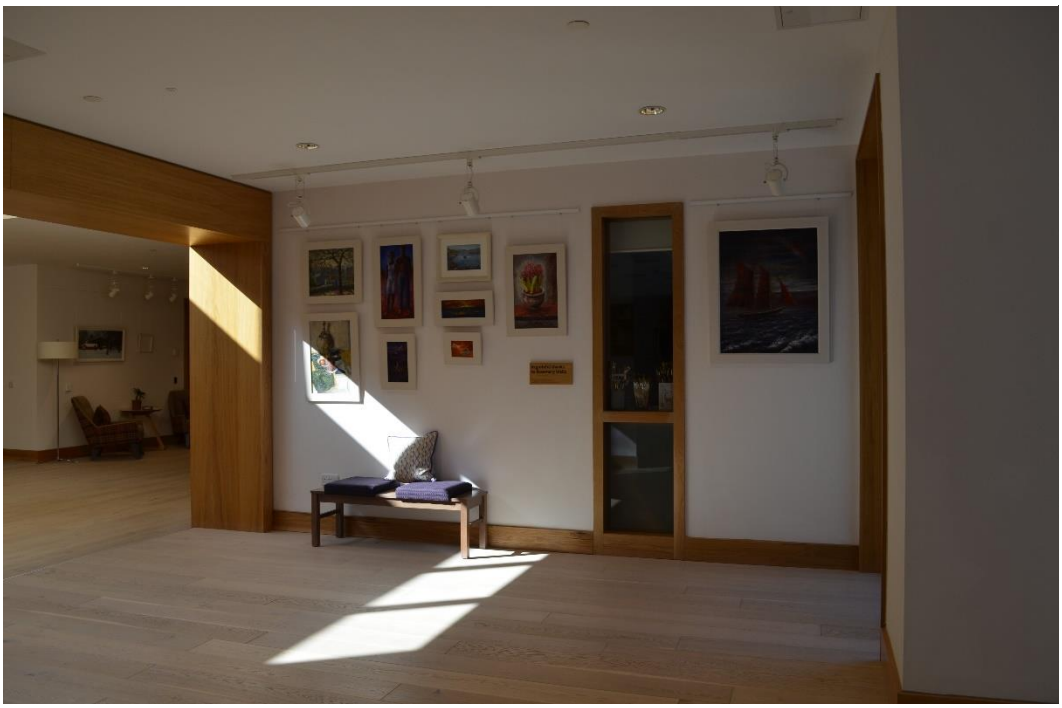


Figure 9-21 Quiet room near Day Services.

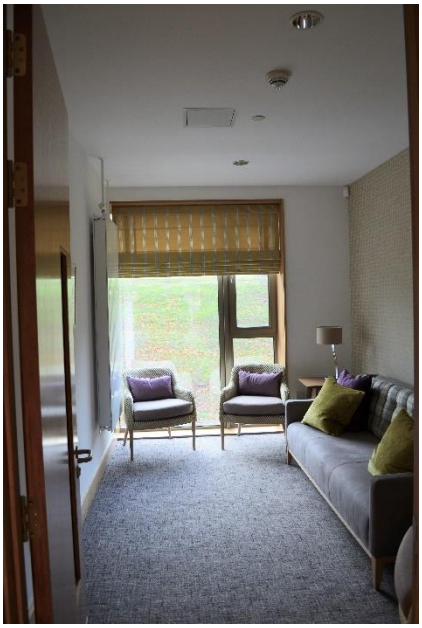


Figure 9-22 Complimentary therapy room.

Figure 9-23 Family zone in patient bedroom.

Figure 9-25 Family dining area.

Figure 9-24 Diagram of zones within the patient bedroom.

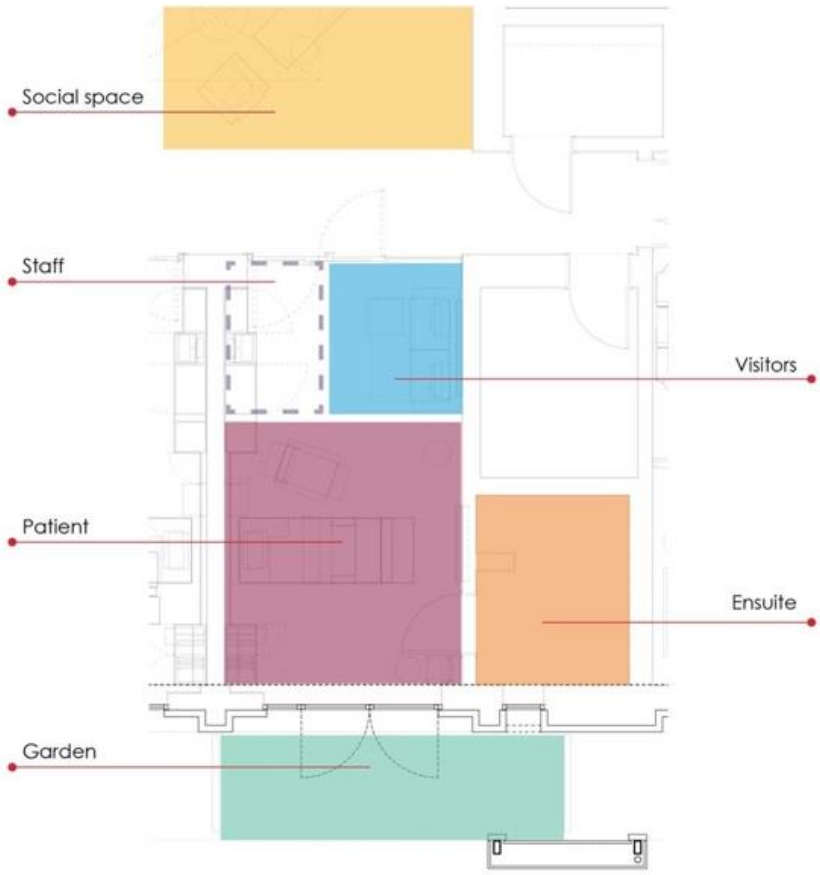


Figure 9-26 Built in furniture which conceals oxygen.

Figure 9-28 Diagram showing social space used primarily for staff working and socialisation for families.

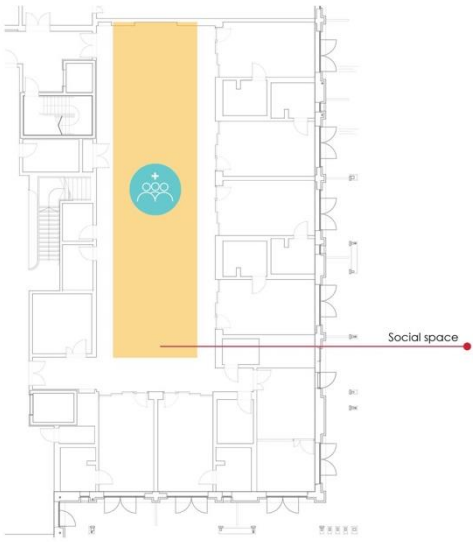
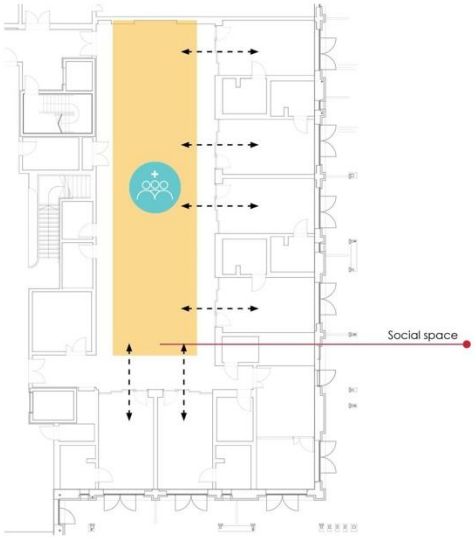


Figure 9-27 Diagram of visual and direct connection between staff in social space and bedrooms.



9.2 Creating Thoughtful Focus

Describing this theme was challenging as it encompasses two distinct characteristics: the use of physical objects or furnishings to facilitate thoughtful focus and the spatial qualities of the environment. The former was associated more with subjective experiences and memories, including cultural and contextual references. The latter was a more innate reaction to certain elements of the environment, such as those related to Browning, Ryan and Clancy (2014) concept of "prospect," which has similarities to the Savanna Hypothesis. Both of these characteristics engage individuals with their surroundings and foster a sense of familiarity that enables them to feel at ease in the space and be mentally receptive to thoughts and reflections, which were crucial in the healing process.

There are two sub-themes evidenced in this theme:

- An Environment that Encourages Wonder, Focus, and Distraction
- Open Space

9.2.1 An Environment that Encourages Wonder, Focus, and Distraction

> "There were some nice artworks, I remember. That catches your eye; your eyes always go to sculptures and artwork, and even the design of the lamps and furnishings was quite nice. To me, that was always something you focused on as well" – Family/friend

Design features integrated throughout the building engage effortless attention while journeying to a destination, which can help absorb and process thoughts and emotions. These included the café, shop, furniture, artwork, lamps, various open seating areas, views of nature from corridors, and the curved staircase leading down to reception. This helped to break down the stigmas attached to healthcare settings of bland corridors void of natural light and full of medical equipment and trolleys. In addition, by the time the destination was reached, this had facilitated a relaxing and engaging journey through the building, which could calm initial anxieties.

> "we have the facilities [at reception] of having the seated area right next to us,

> and we've got the distractions of the television, which people can focus on as well …" – Staff
>
> "[we] made use of [the reception] area … sometimes when we were waiting to be called down. It's a very pleasant area, and at Christmas time, they had the Christmas tree as well, that was nice." – Family/friend
>
> "I like coming into the entrance; that wall behind reception is lovely. It's quite a focus. Then there's the shop, on the right-hand side as you go in, with lots of scarves and jewellery that you can look at and purchase. You can get stuff for Christmas, cards and presents like the scarfs are displayed outside, which is good to have a look at" – Patient

In addition, unique design features helped established engagement and discussion points throughout the building. These included the fireplaces and immersive "bay" windows (Figure 9-29). This offered a supplementary heat source and created a cosy, homely atmosphere; people gather around to socialise or get lost in thought by observing the flames (Figure 9-30). As patients with life-limiting conditions can especially be sensitive to the cold, the fireplaces were a valuable feature for providing instant and visible warmth. The bay windows, often referred to as the hanging windows, were throughout the building and accompanied by a bench to immerse yourself within nature beyond, providing a similar experience to the balconies but with more protection from the weather.

> "I love that all chairs are centred around the fire" – Staff
>
> "It's comfy. When you just want to sit down, you can just sit back and watch the flames; they don't even have to be on full. Sometimes when it's cold, they will have it on to heat the room, but it's a bonus just to sit and watch the flames. – Patient
>
> "It's quite an unusual window. They call that the hanging window. I don't know if that's what it's meant to be called, but that's what it's getting called. They've not seen one like that before, and also it makes you feel you're kind of floating when you're looking out of it, then you look down and go, "oh look, I didn't realise that was there" … everybody comments on it when they come in here … I think that's really important if you've got somebody coming into a session, who has never experienced anything like this before or even if they have, they're coming into a room with a stranger, and there is a talking

point. It breaks down a barrier" – Staff

There could be anxiety with a patient's first visit to the services, equally or even more so felt by families and friends. However, one thing considered within the environment's design facilitates a calm and reassuring atmosphere, reinforced by the staff and volunteers: the café (Figure 9-31) and shop established a sense of normality, with the impression of eating or browsing or buying gifts at an independent local business. This feeling was amplified by having a dedicated space with a different appearance from the rest of the building.

> "my mother used it to meet friends before she was ever unwell and before covid started; she used the café to meet a friend there and have lunch. It's a very social place … She used it as a nice place to have lunch with a friend, and I suppose she thought it would support the work of the hospice." – Family/friend

> "[patients] have the chance to go and do their own bit of shopping, pick things up… they've not lost that being part of society… It really helps because if they've not been in the shop for maybe a month, two months, or maybe even been in the house as a Day Services patient, they know they can pop in and get a card and get a small gift, they can have a look about - even if they just want to browse round the shop." – Staff

Even the views towards the gardens from the bedrooms afforded patients who could not get out the opportunity to connect with the world beyond their room: seeing people, wildlife, and nature. 89% of patients, family and friends rated access to a view of nature from the bed as "excellent" or "good" (Figure 9-32).

> "You can hear the bird's tweet, which is fantastic, and you can see the odd rabbit, and there's another thing we used to see running about. It's just the surroundings, the apple tree and the waterfall down the path when you're out for a walk. Absolutely fantastic." – Patient

> "some of the patients and their relatives bring in plants and planters and leave them outside... One of the visitors brought up a birdfeeder, and it was great seeing all the birds coming down, and I was saying you will get the squirrels…" – Staff

> "If it had been summertime or early autumn, we could have supported my

> mum to move even in a wheelchair; we could have gone out… You're down at a different level, but you're still able to see the ground and walk outside if you really wanted to. That was nice. It's not like you're in a hospital, up a floor. There's that feeling of the outdoors-in because of the huge windows" – Family/friend

9.2.2 Open Space

> "[what's good is] space, the amount of space, light, the location being in the middle of a park, being surrounded by nature." – Staff

A recurring theme of "open space" related to various aspects of the building design and grounds. The building was often described as light and airy, supported through immersive and expansive views of the outside, high levels of natural light and the open plan layout. This openness was achieved throughout the entire building, floor to ceiling windows in circulation spaces and larger rooms offering expansive views and the filtration of passive light into large areas, such as the Day Lounge. The openness was inviting rather than, as you might expect, exposing with people in a vulnerable emotional state. It offered room for people to sit with their thoughts but still feel engaged with their surroundings without the space feeling too small and confined or too big and intimidating. If people felt more overwhelmed, there were smaller areas or private rooms near reception (Figure 9-33) and throughout the building.

> "there is plenty of spaces, plenty of open space, very airy. Peaceful." – Patient

> "[The entrance is] just one door, and there's two walls on either side, then it's just immediately a really big space, and the desk is just like on the left, it's just all open, and the reception is just like a desk dropped in the middle of this massive space… Sometimes I'd sit on the seats that are next to the reception desk or the ones that are near the fireplace. I just switch it up." – Client

> "You came down those nice stairs, and you pass the kitchen area. You notice the whole openness of it, with all the rooms built round these open areas, with nice sofas and chairs." – Family/friend

The building had 360-degree views of nature (Figure 9-34). Almost every single area had not only access to natural light but a view looking out to nature. Figure 9-35

shows 87% of patients, family and friends felt access to a window with a view was "excellent" or "good". The balconies and terraces throughout the building offered another opportunity to be outside. Although there was transparency to the building both from outside-in and inside-out the landscape and pathway design provided visual privacy inside the building; from the western hillside wildflower meadow to the eastern open lawn. Major pathways were a reasonable distance away from the building, and areas of planting acted as separators (Figure 9-36). Blinds throughout the building offered an extra layer for those who feel exposed.

> "the greenery of it gives you a positive vibe ... In getting a lot of sunlight in … it just makes you feel more comfortable because you can physically see everything a lot better" – Family/friend

> "There was a nice large lawn space further down towards the building, so that was a nice vista. Again, you could be sitting in any of the gardens and looking towards that lawn, and I think the lawn again took my interest away from the building; that was more my focus because there is such a big expanse, and I think because it's downhill from the garden, it draws your eye down and across the lawn rather than up and towards the building" – Family/friend

> "from the outside-in, it doesn't really give very much away. I do feel it's quite private; any time I did look towards it, I couldn't see anything" – Family/friend

> "when I was coming back down from the [destination] hut, I could see the bedrooms are actually quite well hidden, and you would really need to be making an effort to see into them, so I thought that was nice that it's quite private… the rooms are almost at below ground level" – Family/friend

A 2.5m wide spine corridor connected the services (Figure 9-37). Corridors leading to the four main departments and public areas were barrier-free, with doors either automatic or open when the services were active. The open café doors created a vista from the main entrance, which invited people into the space.

> "on the whole, people say this building offers some independence, as there's not a lot of doors to get through, so when they're in through that front door, they can get right round to Day Services with no doors, they're all open..."–

Staff

> “The wideness of the place, the open space, the wide corridors [are good]. Especially that walk down to Day Services, patients don’t feel crammed in. Our patient is sometimes elderly and slow walking, and if the corridors are narrow and there is somebody behind them, they feel like they’re holding them up - so they try and hurry up. Whereas there is plenty of space for them to walk at their own pace and people can still overtake them, staff can overtake them and walk away down, and they feel like they can go at their own leisurely pace. That’s really good.” – Staff

Although the space was open plan, noise levels were not a concern. Any excessive noise was contained in circulation space, notably the two atriums, a design that aimed to increase connectivity throughout the three floors. Excess noise was attributed, in part, to the wooden floors and hard surfaces, not just the open space. However, as they were circulation spaces they acted as effective “buffer” zones, stopping noise from penetrating noise-sensitive areas across the services.

Figure 9-29 Bay "hanging" window.

> “[the noise is] not so bad because we don't have people [in reception] for any length of time... if we've got larger groups, maybe school groups, then the noise can maybe carry-on downstairs, but the [patient] rooms are set away from the reception and from ourselves and because we've got the atrium area if I know we've got large groups coming in then we will always coordinate them through to the atrium... So that we can keep the noise away [from the desk], and that allows us to do what we need to do at reception if you're dealing with sensitive stuff.” – Staff

> ”You can hear people talking [at reception], but it’s never noisy or really loud; you can just hear people talking.” – Family/friend

Figure 9-30 Images of sitting around the fire in Day Services.

Figure 9-31 Cafe decor.

Figure 9-32 Respondents' satisfaction with views of nature out the window from their bed.

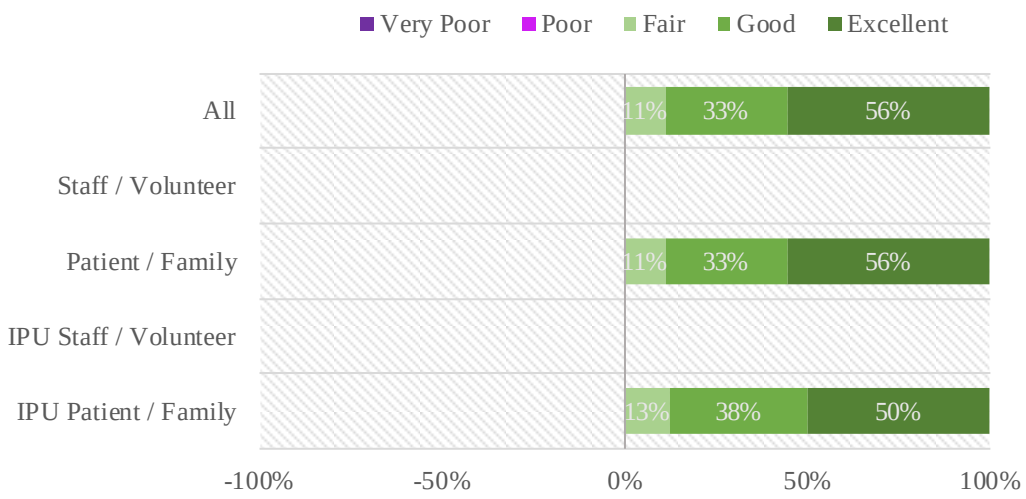


Figure 9-33 More intimate seating area beside reception.

Figure 9-34 Four views towards North, East, South and West.

Figure 9-35 Respondents' satisfaction with access to a window with views of the outside.

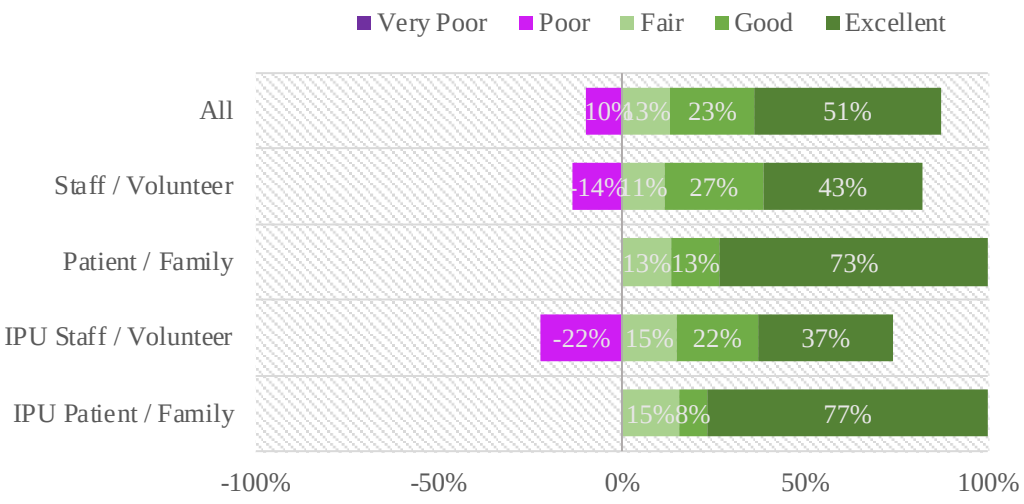


Figure 9-36 View from inside-out and outside-in and from destination hut.

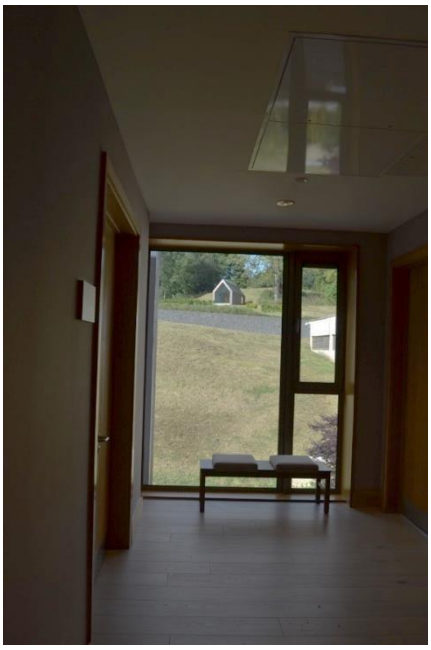


Figure 9-37 Corridor to complimentary therapy rooms.

9.3 Experience of Holistic Sensory Environment

Although sharing similarities to the previous themes, this feature encapsulates a more tangible and prolonged engagement with the environment. Such as following the journey of the local wildlife and physical engagement with nature. The primary aim of this theme was to reconnect with nature, self and others through mindful activities engaging with the immediate surroundings. The theme mainly focuses on the external nature of the facility and the building's integration into its landscape setting.

There are three sub-themes evidenced in this theme:

- A Healing Environment for the Senses
- The Importance of the Journey, Not Just the Destination
- Being Present with Nature
- The Healing Aspects of Nature

9.3.1 A Healing Environment for the Senses

> "[the IPU is] quiet but not silent, if that makes sense? There is noise, there is room, there's stuff going on, and I think when you're coming from other environments, whether it's home or you're at hospital and it's super busy" – Staff

The IPU was found to be a peaceful environment with low noise levels, which was supported by both quantitative and qualitative data. This was highlighted in the qualitative data, with 62% of IPU staff /volunteers and 76% of IPU patients, family and friends stating the noise levels were "Just right" (Figure 9-38). In addition, 100% of IPU patients, family and friends reporting to be "never" or "rarely" awakened by noise at night (Figure 9-39).

DB measurements show that, in a patient bedroom, between the hours of 8 am-10 pm, dB levels were under "ideal sleep" levels of 40db, 77.2% of the time, reaching over "disturbed rest" level of 55 dB and "conversation" level of 60db, only 3.2% and 1.1% of the time, retrospectively. This dropped to 66.4% below "ideal sleep" levels

of 40db and never reached over “disturbed rest” during the nighttime hours of 8 pm-10 am. Between the hours of 8 am-10 pm in the social space, dB levels were under “ideal sleep” levels of 40db 35% of the time, reaching over “disturbed rest” level of 55 and “conversation” level of 60db, only 2.1% and 1.1% of the time retrospectively. This dropped to 86.1% below “ideal sleep” levels of 40db and only 0.1% over “disturbed rest” level of 55db during the hours of 8 pm-10 am (Figure 9-41).

The social space also acted as a buffer between bedrooms, with glazed double doors providing visual engagement with activities in the social space and outside (Figure 9-40), which gave the perception of not complete silence and lessened feelings of isolation. The lower ceiling height in the bedrooms also helped to dampen noise.

> “you don’t hear the same thing that you do in the [nearby large acute hospital] about the single rooms and isolation as much. They’re still occasionally people who don’t like being on their own for any periods of time, but in the [that hospital], it’s quite common for you to hear people saying the doors are shut, and they don’t see anybody for four hours. I don’t hear the same thing about that here.” – Staff

According to both participant perspectives and measurements the IPU had exceptional fresh air circulation, which prevented any unpleasant clinical odours from lingering. According to CO2 measurements taken in patient bedrooms, the indoor air quality remained at or below 1000 PPM, indicating a healthy environment. Additionally, the measurements indicated that air quality was below 400 PPM, which is indicative of good outdoor air quality, for 6% of the day (8 am-10 pm) and 25% of the night (10 pm-8 am) (Figure 9-42). The bedrooms' proximity to the surrounding nature allowed for fresh air and excellent ventilation.

> “it is a very pleasant place to be. It doesn’t smell like there will be a lot of body fluid coming out of there, so for me, it’s positive it doesn’t smell like a lot of clinical places do. And for some people, that might not make any difference, but for me is a pleasant environment to be in, that it doesn’t smell like a hospital.” – Family/friend

> “It was nice, and you could open the big doors if you were too warm to let fresh air in. Which I thought was fabulous because, in the hospital, you can’t

do that; you can't even open the window in the hospital because of infection. In the hospice, you could open up all the doors and let the fresh air in." – Family/friend

9.3.2 The Importance of the Journey, Not Just the Destination

Intuitive wayfinding was achieved through the open plan layout (Figure 9-43), with passive signposts such as seating areas, artwork, and atriums contributing to this. Minimal signage made the environment less clinical; however, that did not seem to affect wayfinding. People could orient themselves around the building once they had visited a few times. On initial visits, the meet and greet volunteers could signpost or took people to their destination.

Accessing the IPU through stairs, rather than lifts, was a novel and welcoming experience compared to typical hospital settings; creating a self-directed mindful journey instead of being moved by automation and enabling autonomy over pace and direction and created opportunities to connect with surroundings. The entrance to each bedded unit was visible from the IPU reception: the bedrooms all centred on an open social space, making them immediately visible upon entering the units. The clarity of directions integrated into the layout, interior design and relative scale provided a transparent public and private space hierarchy, and prevented people from being led into staff areas and negated the need for obtrusive, negative signage.

"we were shown where we were going, and it was straightforward. There's a nice area of seating just past the lifts." – Family/friend

"being able to go downstairs was great, not having to use an elevator because it's all on a few levels, like the way you need to take a lift in the hospital as it's all built up" – Family/friend

"people, once they've been and had a tour, they find it fairly easy to orientate themselves. There's not a lot that can go massively wrong; as long as you know which ward you're starting on, then it's usually fine." – Staff

"it took me a while to find the room numbers, but once I did, it was easy. All the rooms are right next to each other." – Family/friend

The well-maintained appearance of the building created a sense of value for those

who use it, similar to that of a hotel, providing a luxurious and peaceful environment (Figure 9-44). The Inpatient Unit (IPU) maintained the same appearance and luxurious atmosphere as the upper floors, with features that created a thoughtful focus. The IPU followed the same open-plan layout as the upper floors, which promoted continuity and maximised natural light levels, even though it was located on the lower ground floor. Additionally, internal courtyards, which opened up to the sky (Figure 9-45), provided both light and visual access to nature for areas deep within the building. Windows were strategically placed to create an inviting, reassuring, and calming atmosphere by allowing daylight and views to the outside, which helped people to orient themselves within the space and avoided feelings of claustrophobia.

> "It was nice and inviting, nice and light, and the decoration was nice and light, nice pictures. I felt it was quite welcoming, and it was a nice experience walking into it." – Patient

> "It could have been a hotel; it was designed more like a hotel. The difference was, there was a hospital bed, but other than that, you would have thought you were in a hotel, to be honest. It took away that hospital environment, which is nice. Obviously, the patient knows they're ill, and in for a reason, but for the family, maybe they wouldn't think about it as much because of the way it's been designed. You could be visiting your mum in a hotel room; you sort of forgot it was a hospice, and you didn't think about it that way." – Family/friend

> "I think the quality of things within the building is phenomenal. You can see it everywhere you go; you would never come into this building and think that you were getting second-class treatment … it's beautiful throughout." – Staff

> "when you go into a hospital reception, it's all full of files, notes and with nurses behind it. That's quite unique as well, the fact that right away, you don't feel it's a hospital environment because it's just one desk with one person behind it." – Family/friend

> "it looks like a beautiful hotel, it's lovely, which you know in a way it doesn't make you think of someone being sick, it makes you think about someone being well and enjoying life, which I suppose that's the aim of hospice care, to make you live well. I suppose it's to have a "good death" as well, but that

looks like a place that you live in; that's what I would say, it's a place you'd think, "I'd like to go there." – Family/friend

"it's beautifully decorated … I know there must've been a lot of money spent on fixtures and fittings, and I suppose I might have thought before that's a lot of money to be spending, but do you know what – it makes people feel valued. If you're going in and you're sitting on a nice chair with a nice cushion, and you're emotionally distressed, well, that environment matters and makes you feel valued, and it makes you feel special in a way that you're getting some kind of comfort. Often people will sit and hug a cushion when I'm talking to them." – Staff

9.3.3 Being Present with Nature

"we can look at the flowers, we can feel the heat of the sun on our skin, we can listen to the trees swishing, we can hear the birds" – Staff

The gardens allowed people to engage with nature, each other, and their thoughts and emotions. This was supported by the establishment of a walking group, where mindfulness and a sense of being present were encouraged through discussion on the change in seasons, observing surroundings, and providing opportunities to interact physically, such as picking and eating apples from the garden. The lawn (Figure 9-46) and the seasonal gardens (Figure 9-47) supported various activities such as socialising, flexible play or holding events, with wide pathways, curved walled seating and open space. As some may have come into the facility on a bed, the ability to see the ground from bedrooms contributed towards improved orientation and reduced feelings of entrapment. Patients even had the choice of have consultations outside, which was especially appreciated for those coming from isolated environments.

"When I joined, the walking group was already established, but there was always a group to do with the entertainment. They put on a show for us, and then they had us out walking and hugging trees. People passing were giving us all looks as we were hugging trees, but the trees are older than us by far." – Patient

"on a Wednesday, with our walking group, we go out, and we go over to the walled garden and then into Bellahouston Park, and there's a volunteer who

> will often try and bring a quiz or a small game to do when we're out. Not that we're recording it, but even if we just make a point of, "let's notice the changes as the seasons are changing and how all the flowers are just the wee buds and then as the weeks go on, their beginning to bloom and be like "what colour do you think that's going to be?". We're just noticing the season's change, which has helped our patients have distractions and things to focus on." – Staff

> "during the summer, they had tables out, and we were out doing various projects, which was good. I've got photographs of everyone sitting out at the tables." – Patient

The hospice further expanded opportunities for physical interaction with nature by introducing a beehive to produce honey and looking into allotment gardens. Interaction with wildlife was significant to many, some tracking the progress of the fox family (Figure 9-48) or putting up feeders to watch the birds. This form of engagement could foster nurturing feelings and a sense of purpose.

9.3.4 The Healing Aspects of Nature

> "The site, for me, was very peaceful and in a nice location. And even though there is a workspace beside it like a plant nursery but it's still quite a nice space; everywhere around it seems very peaceful; although you can see neighbouring properties, it's all very peaceful it's very, very quiet, and anywhere you look, it was all nice views." – Family/friend

The site was quiet and peaceful, experienced right from the entrance gates. Noise level measurements evidenced that levels reduced the further the site extended, protecting bedrooms from excessive noise. Between the hours of 9 am-7 pm, outdoor levels reached over "conversation" level of 60db; 64.6% of the time at the main reception entrance (Figure 9-49), 5.3% of the time at the patient entrance (Figure 9-50), and 1.7% of the time at the Day Lounge balconies (Figure 9-51). Sitting and looking at the various planting offered space for restoration, where people could clear their minds and get lost in thought. The walled seating in the seasonal garden provided endless seating options (Figure 9-52). Unlike a static bench, people could explore and find their favourite space to sit.

> “it's lovely; it's very tranquil. It's funny, the road coming into the car park, it's really quite busy. People coming and going all the time, but you don’t get that feeling in the building at all. Although there’s a lot going on roundabout it, it’s very tranquil. That’s quite interesting.
>
> The entrance to the building that's closest to the business outside it almost cuts it off. The garden seems very tranquil as well, it’s not just about the design of the building, but it’s the design of the whole site, very tranquil and inviting.” – Family/friend

> “The outside space from her bedroom, that was my favourite because you could sit out there and be anywhere. It didn’t feel like you were in a hospice or a particular space; the garden was lovely, everything they had done in the garden. The different areas with the different planting, it was a nice and open space, very open.” – Family/friend

> “I felt I could let my thoughts drift and just enjoy the space; I felt quite peaceful and interested in it, and I found myself thinking, although some of the plants were bare. I thought, I wonder what they would look like further on in the year, and it would maybe make me think, I would like to see that.” – Family/friend

Experiences within the gardens were unique to the individual and their current emotional state, either seeking an open area that encouraged interaction with others or a space where they could “hide” and feel protected among the planting. The overhangs of the balconies (Figure 9-53) echoed this feeling of protection while providing shelter from the unpredictable Scottish climate. This was an experience people attributed to the entire grounds, feeling it was a safe space. Staff were keen to see the further development of sheltered areas throughout the gardens after seeing the benefits of the destination hut. Although this was mentioned in the initial design statement (incorporate “shelter structure[s] within which to sit or take shelter from the weather” (Pert et al,. 2013), it was never fully realised and staff now advocate for the advantages of such shelter for those with sun sensitivities.

> “I think there is a kind of fun aspect to it, a kind of “hide and seek” type of thing. I’m quite a private person, so I did like that aspect of it; I kind of like to hide.” – Family/friend

> "The fact that you could open up your doors from the bedroom and sit out in the garden and there was an overhang, you could sit at the door if it was raining." – Family/friend

> "the bit that was missing was that we needed a bit more shelter, but I think that's easily fixed. So, I think if we had more tables, chairs and shelter, then that would be fab." – Staff

Although complying with building regulations, the pathway to the destination hut had a steeper incline than the gentle slopes of other parts of the grounds (Figure 9-54), proving a challenging route for those who were frailer. It was clear that staff, potentially from experience working with vulnerable populations, acknowledged that this route might be more difficult for some. However, as with many aspects of the facility, everyone was getting used to exploring and enhancing its potential. This aspect of the facility was seen as having lots of development opportunities.

> "I love the fact that even the outside gardens … and even up the destination hut is wheelchair accessible … as you come out of Day Services, there is a ramp that takes you up the winding path. So, it is accessible … if you've got an electric wheelchair, that's great, but if you're pushing people, there is still an incline… but it's accessible." – Staff

An initial design aspiration was to retain as much as the site topography (Pert *et al.*, 2013a). Therefore, this pathway to the elevated position of the destination hut (Figure 9-55) offered an alternative perspective of the building and surroundings from that of ground level. Something evident throughout the site with alternative perspectives from various viewing angles in the grounds and park: which established an air of intrigue and wonder and encouraged people to explore the site.

> "Even up here, up on the hill. The path stops, but there's like a wild area below that I love the different views and outlook from the building of the different hillsides, the different types of planting – like the wild gardens, the seasonal gardens and the pond." – Patient

> "It looks very modern and nicely placed where it is. The building looks absolutely beautiful from the outside, looking up to it. You get a better view from the pond area, up towards the building itself and its lovely." – Patient

> "I've been all over. It's lovely looking down into the gardens and seeing the roof of the hospice. The colour it's lovely, looking down on it. That hut at the top is lovely and light." – Patient

There was a strong connection between art and nature, with many patients drawing inspiration from the outdoors for their creative pursuits. Patients going out and bringing back inspiration to discuss and inform their creations within the Art Room was an activity staff would like to further develop within the art services.

> "[the gardens are] a conversation starter with people on the wards, I think being able to use that again as a way to just kind of activate the imagination or to have a different kind of dialogue. It's like another opening or access point that you can draw on in a creative way." – Staff

> "It's 100%, [the gardens are] absolutely beautiful, I do photography when I'm at Day Services, and I've taken some lovely photographs during the winter and then into summer." – Patient

Family Support Services offered informal side-by-side conversations outside during walks through the grounds, which could feel less intimidating than facing people within an enclosed space. The accessibility of outside allowed them to tailor sessions to support individual needs and preferences. As many sessions often involved uncomfortable emotions or vulnerability, directing the session structure to develop organically enabled people to feel comfortable and empowered. Outside access allowed pets to visit, a source of comfort for many. It's also offered independence and empowered people to take steps they might not have ordinarily and gain a sense of achievement.

> "if you're working with a young person, they're more likely to share if they're out walking with you ... It's probably when they're going to get that information because there's something about not sitting facing each other… about being more relaxed, and it's more conversational." – Staff

> "people already bring dogs into the hospice, but … I had a young guy in who has Asperger's and had a dog, and the person who died was the owner of the dog, and he took the dog in... and he feels he's got a connection to his uncle through this dog. The dog has become really important to him and the only person, for want of a better word, that he felt he could talk to about his grief.

> So, I said to him, “look do you want to bring this dog into sessions”, which he was delighted with, and it really, really helped break down barriers… for us but also for him to come into the hospice and bringing the dog. We would have half the session in the room, and then the other half of the session, we would go out into the garden and go for a walk with the dog.” – Staff

The topography and landscaping of the destination hut offered views of the surrounding park and further towards the city centre (Figure 9-57), which facilitated conversations, especially beneficial when providing support for those who felt anxious or not as comfortable sharing. The view offered a talking point supporting people to speak freely.

> “the destination building, that's often a destination that we go to, not to be in the hut itself but to get the view because you've got a fabulous view of the city skyline… it's a really good talking point if you are…coming into a service and you’re feeling anxiety around that, well, you’re here because you’re bereaved or you’re going to be bereaved, and that’s potentially a really emotionally demanding and frightening experience, to anticipate coming into but if you can go and say “oh look I know that place and I can see the university”, it just helps to build that relationship.” – Staff

Access to the gardens and park provided a therapeutic environment for staff, with a refreshing space away from their work environment to spend time alone or with colleagues. The outdoor rooftop terrace (Figure 9-56) was especially beneficial for allowing staff, who might be busy that day, to briefly access a restorative outside space.

> “having the likes of the external terraces, so in the summer months on a nice day you don’t need to sit in the office and have your meeting, you can sit outside. … during the summer months, staff are sitting outside having their lunch; a lot of fresh air coming through the building, staff will go a walk on their lunch or go out a run… That’s actually very good for staff and helps with their resilience as well.” – Staff

> “I was just sitting and thinking this was bliss: lunch break, music on, sunshine - this is fabulous … how lucky are we to have that space. Especially doing the job that we do. And we’ve had meetings out on the balconies already.” – Staff

Figure 9-38 Respondents' satisfaction with noise level.

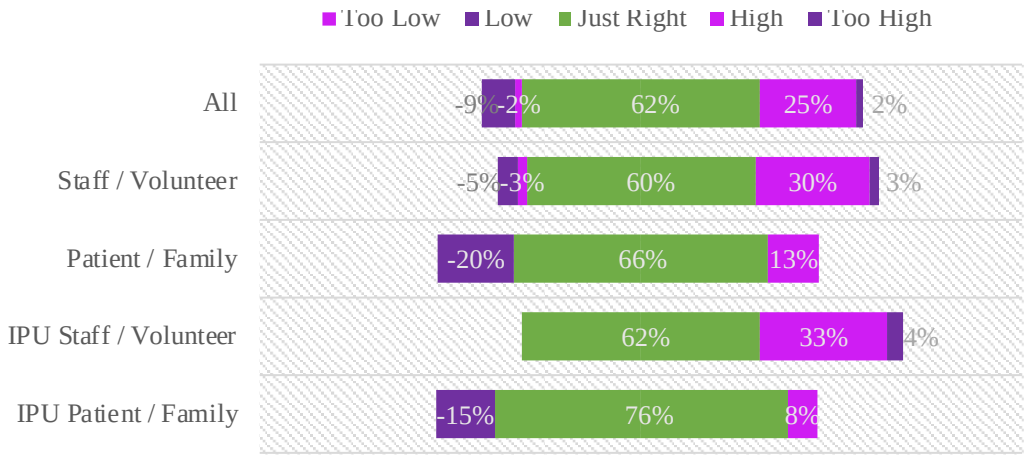


Figure 9-39 Respondents' frequency of being awakened at night by sounds, other than for required activities.

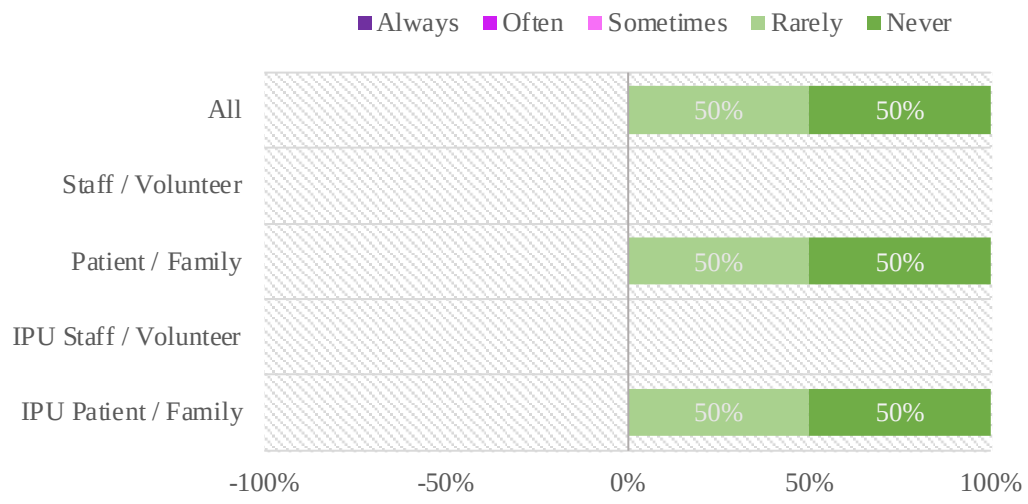
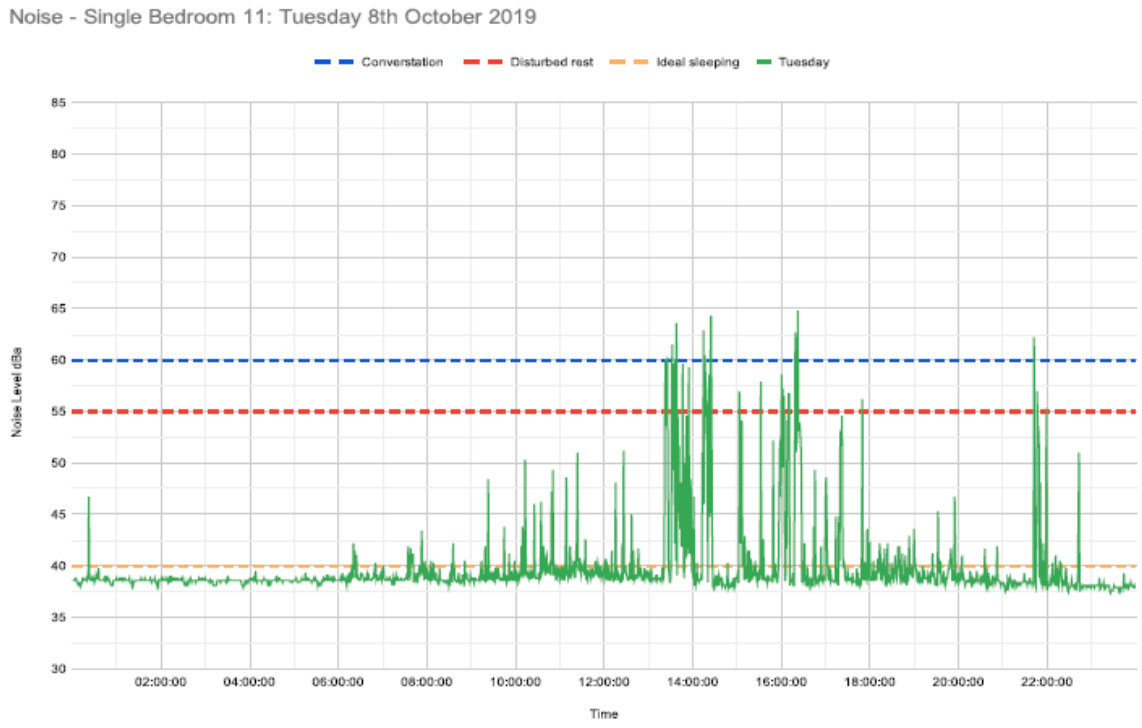


Figure 9-40 View towards social space from bedroom.

Figure 9-41 Graphs showing noise measurements within bedroom 11 and social space, over a 24hr.



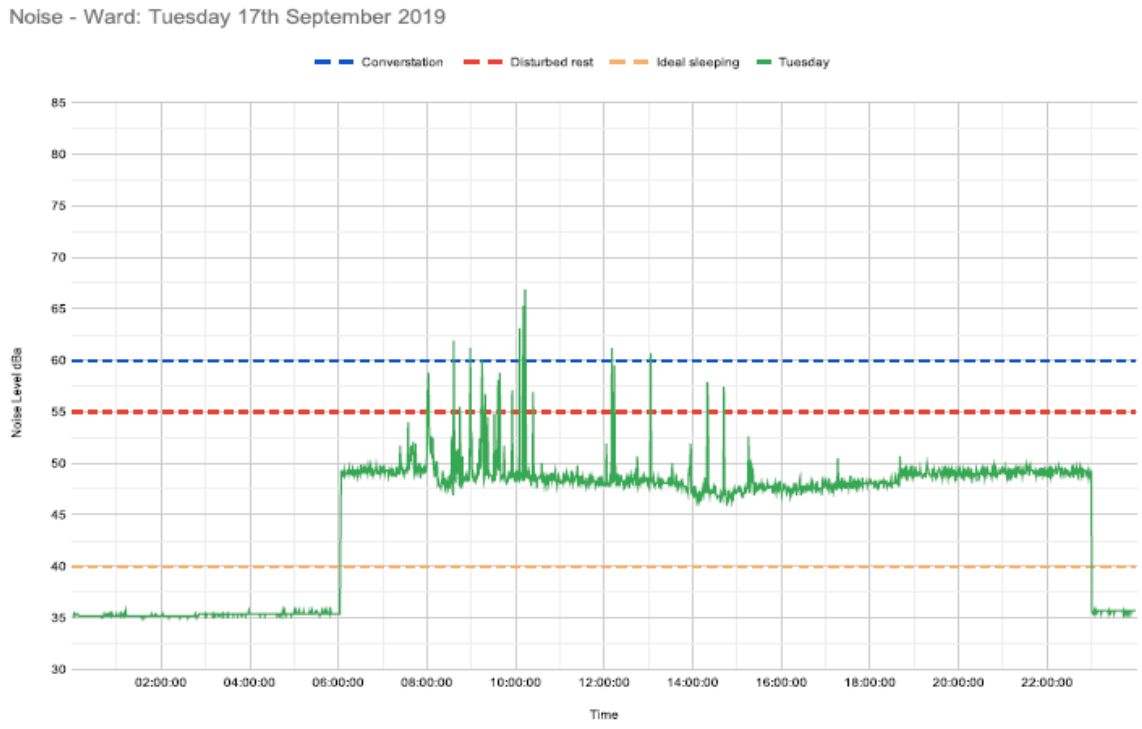


Figure 9-42 Graph showing CO2 levels measured within the bedroom 11 over a 24hr period.

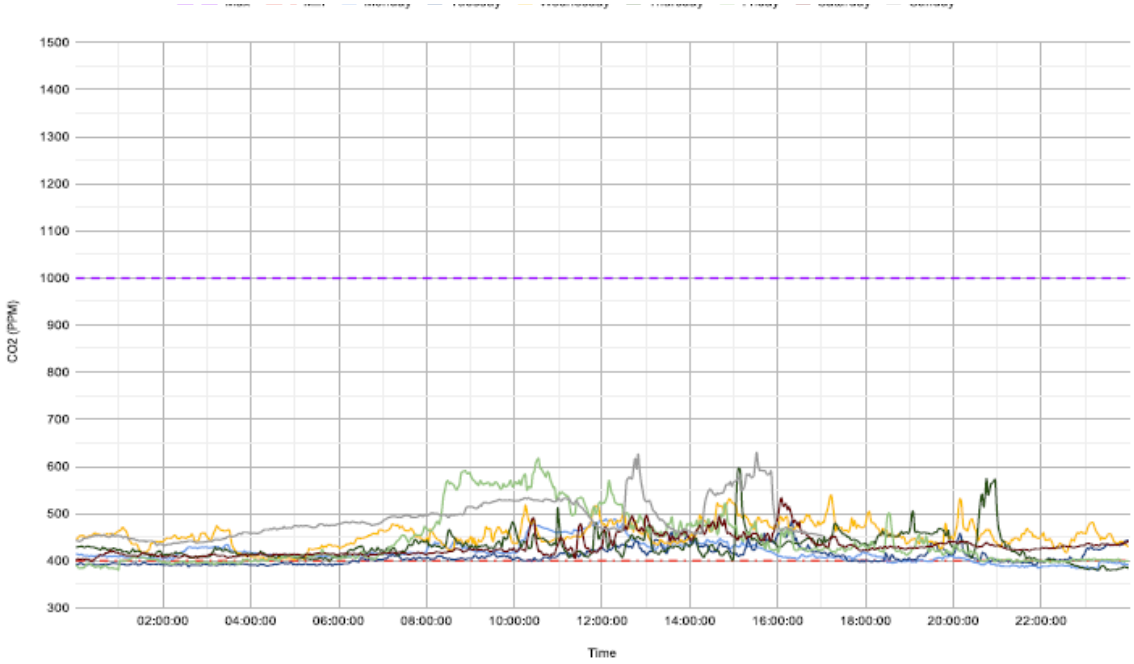


Figure 9-43 Diagram of sightlines from main reception entrance, highlighting the ease of wayfinding.

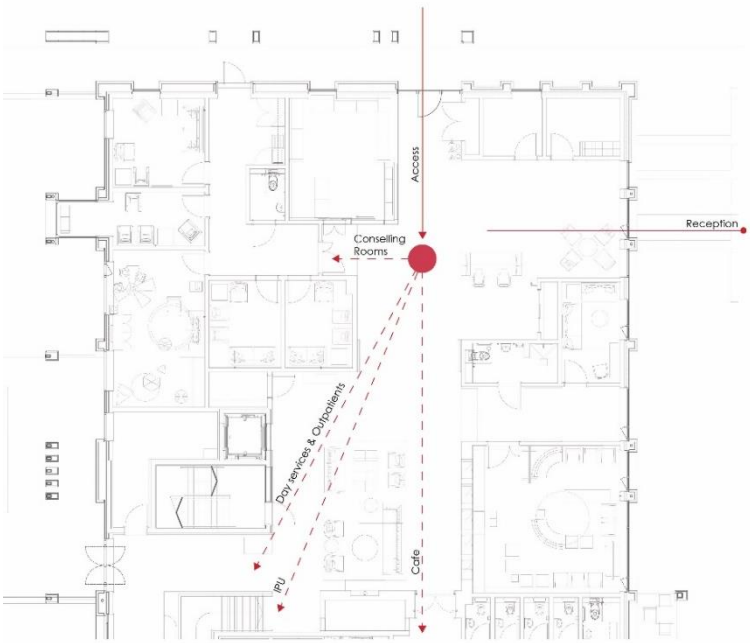


Figure 9-44 Example of décor within Day Lounge.

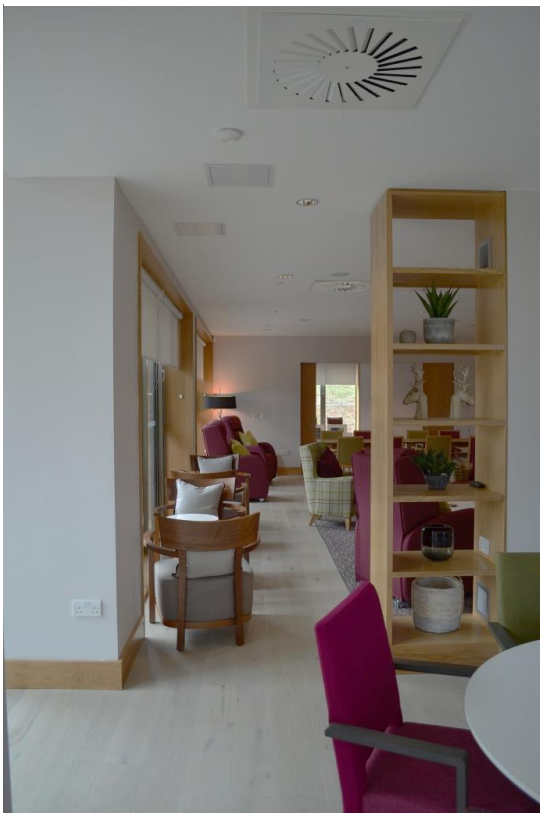


Figure 9-45 A view towards the internal courtyard from a corridor leading to IPU reception.

Figure 9-46 Expansive lawn area in front of bedrooms.

Figure 9-47 Four distinct seasonal gardens, ensuring planting is in bloom all year round.

Figure 9-48 PPWH social media post of resident foxes.

Figure 9-49 Noise measurements main reception entrance, over a 24hr period.

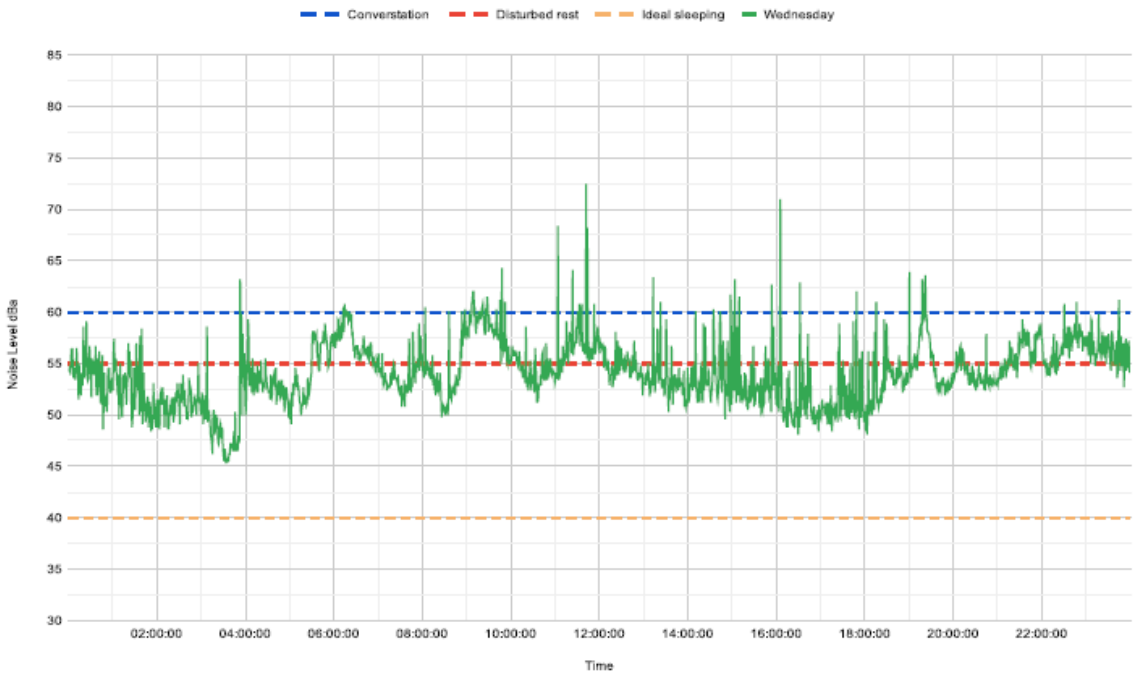


Figure 9-50 Noise measurements Patient entrance, over a 24hr period.

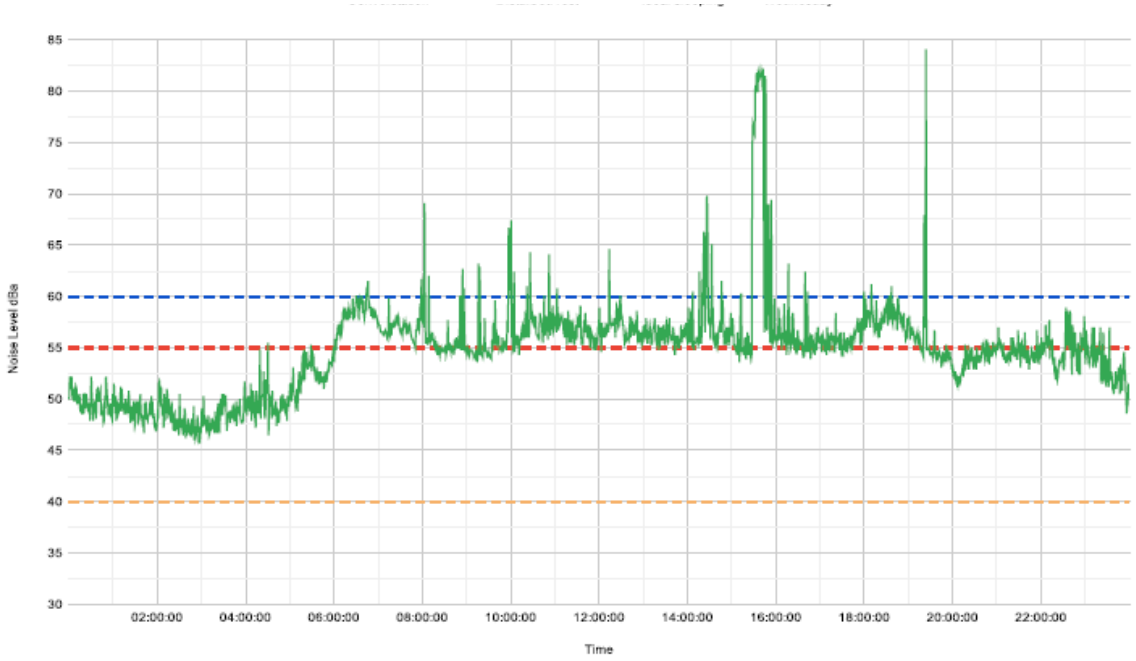


Figure 9-51 Noise measurements outside Day Lounge balcony, over a 24hr period.

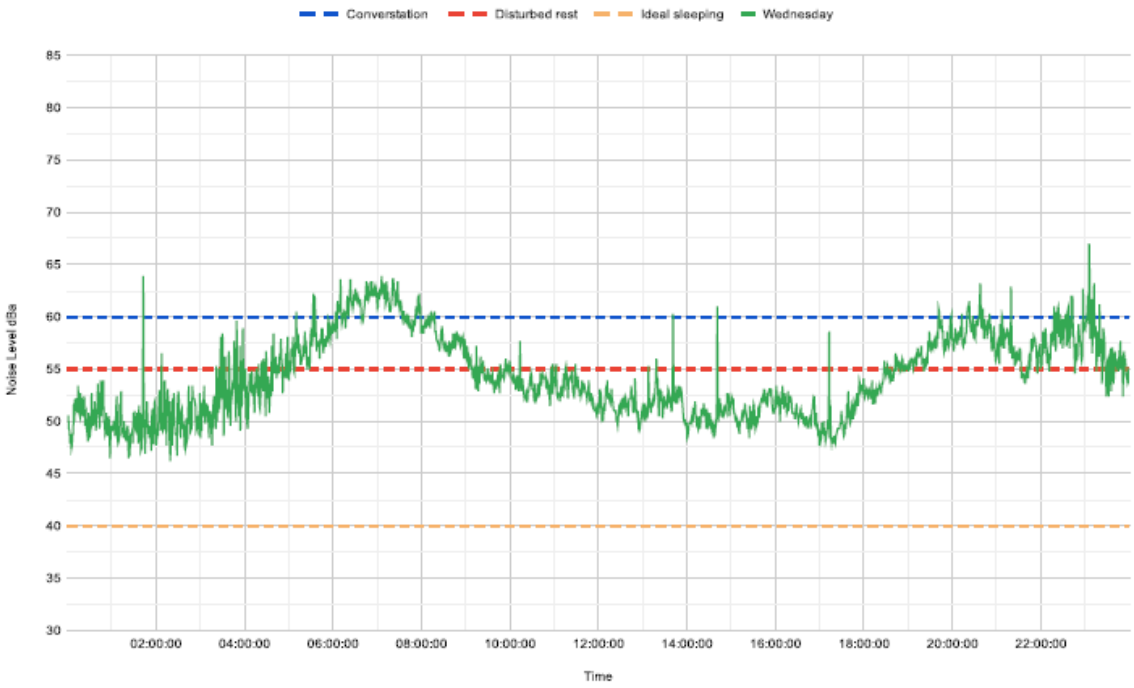


Figure 9-52 Bench seating within the Seasonal gardens.

Figure 9-53 balcony overhangs provided shelter from weather in the individual patient gardens.

Figure 9-54 Accessible pathway to destination hut with compliant gradient 1:20 (Forbes et al, 2013).

Figure 9-55 View from the destination hut towards the hospice.

Figure 9-57 View towards Glasgow city centre from near destination hut.

Figure 9-56 Terraces located throughout staff areas on the first floor.

9.4 Critique of POE Methodologies

This section contains the included articles identified through the scoping review in Chapter 4. These 15[7] articles related to the research questions "What methodologies can be used to measure the person-centred outcomes of a hospice environment that focus on wellbeing?". Therefore, these studies are directly comparable to the palliative care settings, population, or evaluation of wellbeing. There was a conceptual framework developed for this study, which is described in Chapter 4, with Table 9-1 summarising the scope. This framework was organised into a matrix to evaluate the effectiveness of the existing articles in addressing this study's aims. Table 9-2 contains the outcomes of this, which shows were studies have addressed the areas fully (marked with a Y) or partial/ implied indirectly (marked with a P). The table contains the study contained in this thesis, which covers all aspect of the framework.

Table 9-1 PPWH Conceptual Framework

Domains	**Participants**	**Wellbeing Evaluation Criteria**	**Environmental Quality Criteria**
Choice	Patient	Comfort	Temperature
Inclusion	Clinical Staff	Control	Ventilation
Noise	Non-clinical Staff	Privacy	Noise
Indoor Air Quality (IAQ)	Family	Safety	Natural Light
Design	Visitor	Sense of Belonging	Artificial Light
Nature		Dignity	
		Nature	
		Art	
		Family Spaces	
		Social Interaction	
		Visibility	
		Accessibility	
		Adaptability	

[7] There were 3 sets of similar studies so these have been considered as one for analysis purposes but both references are included in the tables for transparency.

Table 9-2 PPWH Conceptual Framework Matrix

	Participants					Domains						Wellbeing Evaluation Criteria													Environmental Quality Criteria				
Author (Year)	Patient	Clinical Staff	Non-clinical Staff	Family	Visitor	Choice	Inclusion	Noise	IAQ	Design	Nature	Comfort	Control	Privacy	Safety	Belonging	Dignity	Nature	Art	Family Spaces	Social Interaction	Visibility	Accessibility	Adaptability	Temp	Ventilation	Noise	Natural light	Artificial light
Rose *et al.* (2022)	Y	Y		Y		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y		Y		Y	Y	Y	Y		Y		Y	Y	Y
(Cai and Spreckelmeyer, 2022)	Y	Y				Y	Y	Y	Y	Y	P	Y	Y	Y	Y		P	P	Y	Y	Y	Y	P	Y	Y	Y	Y	Y	
(Ferrante and Villani, 2021)	Y			Y		Y	P	Y	Y	Y	Y	Y	Y	Y	P	P		Y	Y	P	P		Y	Y	Y	Y	Y	Y	Y
(Mahmood and Tayib, 2019; Mahmood and Tayib, 2020)	Y	Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		P	Y	Y	Y	P	Y	P	Y		Y	Y	P	Y
(Tinner, 2016; Tinner, Crovella and Rosenbaum, 2018)	Y	Y	Y			Y	P	Y	P	Y	Y	Y	Y	Y				Y	Y		Y		Y		Y		Y	Y	
(Alvaro *et al.*, 2016)	Y	Y	P				Y			Y	Y	Y			Y	Y		Y			Y							Y	
(Ferri *et al.*, 2015)	Y	Y	Y	Y		Y		Y		Y	Y	Y		Y				Y		Y	Y	Y	Y				Y		
(Kader, 2017)						Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	P	Y	P			Y		

(Zallio and Clarkson, 2022)						Y	Y					Y	Y								Y		Y							
(Shepley *et al.*, 2012)	Y	Y	Y	Y	Y	Y		Y		Y	Y	Y	Y	Y		Y		Y		Y	Y	Y	Y				Y	Y	
(Abbas, 2009; Ghazali, 2010)	Y	Y		Y		Y	Y			Y	Y	Y	Y	Y	P	Y	Y	Y	Y	Y	Y	Y	Y	P				Y	
(Watson, 2018)						Y	Y			Y		Y	Y								Y								
(Tekbiyik Tekin and Dincyurek, 2023)	Y	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	P	Y	Y	Y	Y		Y					Y	Y	Y	Y
(Barnes, Torrington and Lindquist, 2016)	Y	Y	P	Y	Y	Y	Y			Y		Y	Y	Y	Y		Y					Y	Y					Y	Y
(Stevenson and Humphris, 2007)			Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y		Y	Y	Y	Y		Y		Y	Y	Y	Y	Y
Current Study	**Y**	**Y**	Y	**Y**	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	**Y**	Y	**Y**	Y	Y	Y	Y	**Y**	Y	**Y**	Y	Y	Y	Y	Y

Notes: “Y” = direct mention; “P” = implied or indirect mention

.

9.4.1 Theme Development

These 15 articles covered 16 broad salient and discriminating principles and practices, there description criteria and number of articles covering them are provided in Table 9-3. Then articles salient and discriminating principles and practices will be discussed throughout this section in relation to this study. For full transparency Table 9-5 provides the key characteristics of each included article such as evaluation criteria, research methods and salient and discriminating principles and practices.

The key salient and discriminating principles and practices come under two broad themes of Study Purpose and Research Methodology. The theme of Study Purpose addresses the key aims and objectives: covering **Interdisciplinary Collaboration**, **Setting Characteristics, Validates Design Principles**, **Generalisability**, and **Wellbeing Focus**. The theme of **Research Methodology** encompasses the foundational aspects of how the overall research was designed and executed: covering **Comprehensive Development**, **Longitudinal, Multi-Method Approach**, **Comparative Analysis, Hierarchical Importance**, **Standardised Tools, Unique Methods, Matrix, Participants, and Resource Intensive**.

Table 9-3 Article Themes

Features	Criteria	Coverage
Wellbeing Focus	Focuses on evaluating wellbeing principles.	12
Comparative Analysis	Compares data either from before, after or during transitioning to a new facility, between different environments, or between participant groups.	11
Multi-Method Approach	Using multiple research methods such as mixed-methods design	9
Standardised Tools	Use of existing consistent, validated tools (adapted or in the original format).	9
Generalisability	Applicability to other settings.	7
Setting Characteristics	Reflect specific environmental, cultural, or operational features of the setting.	7
Interdisciplinary Collaboration	Engages a range of experts from different fields.	6
Participants	Data collected from a group (or groups) of participants,	6

	typically focusing either on staff or patients.	
Comprehensive Development	Detailed methodology, extensive data collection, or in-depth analysis.	3
Longitudinal	Conducted in several phases, across different settings or times.	3
Unique Methods	Integrates innovative techniques or approaches.	3
Validates Design Principles	Uses design principles as the theoretical basis of evaluation.	2
Hierarchical importance	Assesses or ranks the significance of factors.	2
Matrix	structured framework or grid-like evaluation format.	2
Resource Intensive	Requirement of substantial resources, including time, personnel, financial, or technological investment.	2

Table 9-4 Article Themes Matrix

	Study Purpose						Research Methodology								
Author (Year)	Interdisciplinary Collaboration	Setting Characteristics	Validates Design Principles	Generalisability	Participants	Wellbeing Focus	Comprehensive Development	Longitudinal	Multi-Method Approach	Comparative Analysis	Hierarchical importance	Standardised Tools	Unique Methods	Matrix	Resource Intensive
(Rose *et al.*, 2022)			Y	Y	Y			Y	Y	Y					
(Cai and Spreckelmeyer, 2022)	Y				Y			Y	Y	Y		Y	Y		
(Ferrante and Villani, 2021)	Y	Y		Y	Y	Y				Y		Y			
(Mahmood and Tayib, 2019; Mahmood and Tayib, 2020)				Y	Y	Y			Y	Y	Y	Y			
(Tinner, 2016; Tinner, Crovella and Rosenbaum, 2018)	Y	Y		Y		Y				Y	Y				
(Alvaro *et al.*, 2016)			Y	Y		Y			Y	Y		Y	Y		
(Ferri *et al.*, 2015)				Y	Y	Y	Y			Y					
(Kader, 2017)	Y	Y				Y	Y							Y	

(Zallio and Clarkson, 2022)	Y	Y					Y		Y						Y
(Shepley *et al.*, 2012)		Y				Y			Y	Y					
(Abbas, 2009; Ghazali, 2010)						Y		Y	Y	Y		Y			
(Watson, 2018)				Y		Y						Y	Y		Y
(Tekbiyik Tekin and Dincyurek, 2023)					Y	Y			Y	Y		Y			
(Barnes, Torrington and Lindquist, 2016)		Y				Y				Y		Y		Y	
(Stevenson and Humphris, 2007)	Y	Y				Y			Y			Y			
Current Study	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Study Purpose Theme

The theme of Interdisciplinary Collaboration emerged prominently across six articles, underscoring the significance of integrating expertise from diverse fields to enhance the depth and applicability of Post-Occupancy Evaluation (POE) research. These articles emphasized the collaborative involvement of environmental psychologists, architects, and healthcare professionals, highlighting an interdisciplinary approach as essential for refining POE practices and ensuring their relevance to specific contexts. The articles by Cai and Spreckelmeyer (2022); Ferrante and Villani (2021); Kader (2017); Stevenson and Humphris (2007); Tinner, Crovella and Rosenbaum (2018); Zallio and Clarkson (2022) collectively illustrate how interdisciplinary efforts can bridge gaps in knowledge and contribute to more holistic and effective POE methodologies.

In addressing the theme of Setting Characteristics, seven articles adapted existing tools to the specific contexts under investigation. These adaptations ensured the POE tools' effectiveness and relevance within the particular environments. The articles by Barnes, Torrington and Lindquist (2016); Ferrante and Villani (2021); Kader (2017); Shepley *et al.* (2012); Stevenson and Humphris (2007); Tinner, Crovella and Rosenbaum (2018); (2022) each demonstrated unique approaches to tailoring POE tools. Notably, Zallio and Clarkson (2022) employed an iterative methodology that concentrated on users' concerns, effectively reducing non-relevant data but posing a risk of biased outcomes towards negative features.

Two articles went further in-depth and covered the theme of Validates Design Principles, aligning their POE methodologies with specific philosophical or theoretical frameworks based around the building under study. Alvaro *et al.* (2016) operationalised the Planetree philosophy, emphasising patient-centred environments, while Rose *et al.* (2022) focused on evaluating environments designed for patient psychosocial wellbeing and social connectedness. These articles provide compelling evidence of how POE can be used not just for evaluation but also for validating the foundational design intentions of the building.

A significant challenge identified in seven articles was the theme of Generalisability of POE methods to other settings, even those with similar typologies. The articles by Alvaro *et al.* (2016); Ferrante and Villani (2021); Ferri *et al.* (2015); Mahmood and Tayib (2020); Rose *et al.* (2022); Tinner, Crovella and Rosenbaum (2018); Watson (2018) highlighted this limitation, underscoring the complexity and specificity required in adapting POE methodologies across different environments. This challenge indicates a need for further research to develop more universally applicable POE tools or to create adaptable frameworks that can be customised for various settings without losing validity.

The theme of Participants was explored in six articles, four of which were limited by focusing on a single group(Cai and Spreckelmeyer, 2022; Ferrante and Villani, 2021; Mahmood and Tayib, 2020; Rose *et al.*, 2022)., potentially reducing the relevance of outcomes for all building users: good practice involves including as many user groups as possible to capture a comprehensive range of feedback. In contrast, the articles by Ferri *et al.* (2015); Tekbiyik Tekin and Dincyurek (2023) excelled by covering all or most of the groups who use the buildings, setting a benchmark for inclusive POE practices.

Wellbeing Focus was a theme in 12 of the 15 articles, particularly within healthcare settings. Six articles focused on cancer care settings (Ferrante and Villani, 2021; Kader, 2017; Shepley *et al.*, 2012; Stevenson and Humphris, 2007; Tekbiyik Tekin and Dincyurek, 2023; Tinner, Crovella and Rosenbaum, 2018), three on general healthcare or hospitals (Alvaro *et al.*, 2016; Ghazali, 2010; Mahmood and Tayib,

2020), one on acute-care units for older adults (Barnes, Torrington and Lindquist, 2016), one on ICU (Ferri *et al.*, 2015), and one on general buildings (Watson, 2018). One of the most influential articles in this regard was Stevenson and Humphris (2007), which utilised a PROBE/BUS methodology to evaluate the wellbeing aspects of the Dundee Maggie's Centre. Kader (2017) introduced the HEAP matrix checklist, specifically aligned to hospice settings and based on the validated PEAP tool, covering wellbeing principles in great depth. However, it overlooked common aspects of POE such as Indoor Air Quality (IAQ) measurements, which can be crucial for interpreting user feedback. This gap was also noted in other articles within this theme, indicating a potential area for further research to reconcile perceived and measured environmental quality (Alvaro *et al.*, 2016; Barnes, Torrington and Lindquist, 2016; Ghazali, 2010; Mahmood and Tayib, 2020; Watson, 2018), .

Research Methodology Theme

The theme of Comprehensive Development features in three articles characterised by iterative development and validation processes (Ferri *et al.*, 2015; Kader, 2017; Zallio and Clarkson, 2022). These articles continuously refined their tools based on participant and expert feedback, ensuring their effectiveness and relevance. Despite their rigorous methodologies, only a few addressed the complete range of topics pertinent to this study. An outlier example is Kader (2017), which formulated the Hospice Environment Assessment Protocol (HEAP), an evaluation matrix designed for hospices. Initially developed as a checklist for building walk-throughs, HEAP holds significant potential for operationalisation in research methods that collect data from building users, enhancing its utility and comprehensiveness.

Kader (2017) covered the theme of Matrix, together with the study by Barnes, Torrington and Lindquist (2016) who developed a matrix to evaluate the design of acute-care settings for older people, focusing on dignity, security, and accessibility. However, this study failed to address several key areas of wellbeing evaluation criteria, such as nature, belonging, and family spaces.

The theme of Hierarchical Importance was featured in two articles, particularly

concerning wellbeing outcomes. Mahmood and Tayib (2020) determined the degree of importance of various features according to participant feedback, providing a structured understanding of priorities in the environment under study. Tinner, Crovella and Rosenbaum (2018) asked participants to rate areas based on specific outcomes such as improved interactions, healing processes, ability to care, work focus, increased relaxation, mood enhancement, positive thoughts, and stress reduction. These articles highlighted the importance of prioritising features that significantly impact wellbeing.

A Multi-Method Approach was central theme in nine of the fifteen reviewed articles, covering diverse settings such as healthcare and hospitals (Alvaro *et al.*, 2016; Cai and Spreckelmeyer, 2022; Ghazali, 2010; Mahmood and Tayib, 2020; Rose *et al.*, 2022), cancer care settings (Shepley *et al.*, 2012; Stevenson and Humphris, 2007; Tekbiyik Tekin and Dincyurek, 2023), and general buildings (Zallio and Clarkson, 2022). These articles demonstrated that employing multiple research methods can provide deeper insights, although some achieved triangulation through single methods that included both quantitative (e.g., Likert scales) and qualitative data (e.g., open-ended questions) (Alvaro *et al.*, 2016; Rose *et al.*, 2022; Shepley *et al.*, 2012). The approach by Cai and Spreckelmeyer (2022); Stevenson and Humphris (2007); Tekbiyik Tekin and Dincyurek (2023) to combine surveys with interviews was found to produce reliable results, offering deeper insights into survey areas. Tekbiyik Tekin and Dincyurek (2023) extending their interview participants by including those beyond clinical staff, such as the architects and designers, providing a more rounded perspective.

The adaption or direct use of existing Standardised Tools was a theme in nine articles that ensured reliability and comparability of data. (Alvaro *et al.*, 2016; Barnes, Torrington and Lindquist, 2016; Cai and Spreckelmeyer, 2022; Ferrante and Villani, 2021; Ghazali, 2010; Mahmood and Tayib, 2020; Stevenson and Humphris, 2007; Tekbiyik Tekin and Dincyurek, 2023; Watson, 2018): leveraged established tools to maintain consistency in their evaluations. For instance, Alvaro *et al.* (2016) provides one of the most comprehensive survey development techniques. This study outlined

specific evaluation criteria and utilised a mix of existing techniques and literature, ensuring strong methodological validity. Although primarily focused on quantitative analysis, this approach could be expanded into more holistic research methods to gain a broader view of the environment. The UK NHS tools of AEDET Evolution and ASPECT tools were operationalising from the existing Matrix into surveys in four articles (Barnes, Torrington and Lindquist, 2016; Ghazali, 2010; Mahmood and Tayib, 2020; Tekbiyik Tekin and Dincyurek, 2023): making them directly applicable to POE gathering feedback from those who use the facilities. Using this pre-existing tool brought validity to the results and suggested that matrices can be used in numerous ways to suit the purpose of the POE.

Three articles covered the theme of Unique Methods not typically part of standard POEs, adding an additional layer of data to their evaluations. Rose *et al.* (2022) used Space Syntax Analysis (SSA) to quantitatively assess visibility and accessibility within nursing units, linking spatial configuration to operational efficiency and staff communication patterns. Watson (2018) introduced Social Return on Investment (SROI) as a unique way to translate wellbeing outcomes into return-on-investment metrics. Alvaro *et al.* (2016) used visual images, allowing participants to place a circle representing themselves concerning their neighbourhood, nature, and the city, providing a unique perspective on environmental connectedness.

However, two articles by Watson (2018); Zallio and Clarkson (2022) came under the theme of Resource Intensive, which could limit the feasibility of such POEs for broader applications.

Longitudinal was a theme in three articles, referring to the data collection and allowing for iterative learning and adaptation of findings. This approach mitigates the limitations of one-time assessments by capturing evolving impacts over time, thus providing a more accurate picture of sustained outcomes. Rose *et al.* (2022) utilised five years of data gathered through HCAHPS and Press Ganey scores. Cai and Spreckelmeyer (2022) collected data continuously over a three-year period, enabling a continuous learning cycle that adapted and applied findings iteratively to enhance healthcare environments. Ghazali (2010) analysed design trends of

paediatric wards over three decades (1980s, 1990s, and 2000s), assessing how design evolution impacts the creation of healing environments.

Comparative Analysis was a theme in 11 articles. These articles employed pre-and post-move designs (Rose *et al.*, 2022; Shepley *et al.*, 2012), pre-and post-move with control (Alvaro *et al.*, 2016; Cai and Spreckelmeyer, 2022), and gathered views from different time points post-move (Ferri *et al.*, 2015). Other articles compared different environments (Barnes, Torrington and Lindquist, 2016; Ferrante and Villani, 2021; Ghazali, 2010; Mahmood and Tayib, 2020; Tekbiyik Tekin and Dincyurek, 2023) or responses between groups (Tinner, Crovella and Rosenbaum, 2018). These comparative approaches allowed for a benchmarking effect, indicating the robustness and adaptability of POE methodologies across various settings.

Discussion

The review of existing Post-Occupancy Evaluation (POE) methodologies reveals that none could be directly applied to the PPWH environment without modifications. This limitation stems from the fact that many methodologies were explicitly developed to address original design intents (Alvaro *et al.*, 2016; Rose *et al.*, 2022) or tailored to particular setting characteristics (Barnes, Torrington and Lindquist, 2016; Ferrante and Villani, 2021; Kader, 2017; Shepley *et al.*, 2012; Stevenson and Humphris, 2007; Tinner, Crovella and Rosenbaum, 2018; Zallio and Clarkson, 2022). Notably, the matrix developed by Kader (2017) and the POE of Dundee's Maggie's Centre by Stevenson and Humphris (2007) emerged as particularly influential articles.

By developing general wellbeing principles and employing a multi-method approach, future POE articles can achieve greater applicability and depth, ensuring that evaluations are comprehensive and contextually relevant. Integrating interdisciplinary perspectives, iterative development, and longitudinal data collection will further enhance the robustness and utility of POE methodologies, contributing to the ongoing improvement of built environments. To address issues related to generalisability, a set of more universal wellbeing principles were developed based

on the findings. These principles can be applied across different environments, offering a more adaptable framework for POE methodologies.

9.5 Conclusions

The first half of this chapter was structured around a first-person perspective narrative with the findings curated from 25 staff, patient, family and friend verbatim interview transcripts. Additionally, supplemented by researchers' observation and summary of themes, with any relevant connections to the quantitative survey and environmental monitoring findings reported in the previous chapter. The data revealed three key themes related to participants' responses to the environmental impacts of wellbeing within the Hospice. Due to this raw unprocessed documentation, this chapter utilised the GT methodology discussed in Chapter 7 and effectively "grounds" the research in the data. The first theme, "Fostering Resilience", described the importance of the environment for creating various opportunities for social engagement and creating various layers of community. The second, "Creating Thoughtful Focus", described the effectiveness of unique design features or layouts that encourage focus and act as a point of attention. The third, "Experience of Holistic Sensory Environment", described the process of self-discovery through observation and focusing on a deep connection with the environment, experience through one or more of the senses and internal thought process.

The second half of this chapter provides an evaluation of existing POE methodologies identified in the scoping review. This critique is based around the conceptual framework for this study to ensure evaluating effectiveness against the aims of the study. The results concluded that no one definitive method could address the study aims but the most salient and discriminating principles and practices could be developed into a novel POE toolkit. The following chapter will explore these findings in relation to existing theory while addressing how they answer the research questions.

Table 9-5 Key characteristics of each included article

Title/ Ref	Evaluation Criteria	Methods	Salient and Discriminating Principles and Practices
Postoccupancy Evaluation of a Neighborhood Concept Redesign of an Acute Care Nursing Unit in a Planetree Hospital **(Rose *et al.*, 2022)**	Work efficiency, productivity, patient room design, support spaces, environmental conditions.	Staff Surveys (6-point Likert scale (disagree-agree) and open-ended) Patient Surveys (Secondary data from Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) and Press Ganey scores)	**Validates Original Design Principles:** The facility was based on the Planetree philosophy (creation of patient-centred environments), and the POE methodology operationalised this as the basis of its evaluation criteria. It helps to validate the hypothesis that the Planetree model reinforced with evidence-based design strategies had positive impacts. **Comparative Analysis:** Utilises a pre- and post-move study design, allowing for direct comparison before and after transitioning to a new facility. **Multi-Method Approach:** The methodology incorporated quantitative (surveys and performance scores) and qualitative (open-ended survey responses) data collection techniques, and the authors state they were analysed for triangulation. **Longitudinal:** The collection of HCAHPS and Press Ganey scores over a five-year period provided a longitudinal perspective on patient satisfaction and perceived care quality, offering a robust dataset to assess the compounding effects of the environment over time. This can overcome the barriers of assessing the design at a single point. **Participants:** The primary research method was to collect staff data only. Patient data is only included through another secondary method (existing HCAHPS and Press Ganey scores) – use of the data, although beneficial, is a limitation of this study as it could introduce bias and was not conducted concerning the specifics of this study.

			Generalisability: single-site study which could limit generalisability
The Continuous Learning Cycle: A Multi-phase Post-occupancy Evaluation (POE) of Decentralized Nursing Unit Design **(Cai and Spreckelmeyer, 2022)**	CHD room checklist (safety, communication, health, job satisfaction, mood, control, comfort, noise, privacy, IAQ, ROI, adaptability), survey (Facilities (décor, cleanliness, staff attitude, temperature, noise), visitors (space provision and comfort), nursing care (attitude, attentiveness, responsive, felt informed, competency), overall (rating of care and likelihood to recommend hospital), and spatial metrics (visibility and accessibility)	Checklists (CHD) Surveys (HCAHPS, Press Ganey) Nurse Interviews SSA	**Comparative Analysis:** Pre-post test with control, allowing for direct comparison before and after the transition to a new facility, while the control the post-design was based on helped create a benchmarking for results. **Standardised Tools:** The research incorporated Standardised POE tools like the Center for Health Design (CHD) medical-surgical inpatient room checklist, Space syntax analysis (SSA), Press Ganey, and *HCAHPS*. These tools facilitated a consistent approach across separate phases and settings, enhancing the reliability of comparisons and findings. **Multi-Method Approach:** The methodology incorporated both quantitative (CHD Checklist, SSA, Press Ganey data, *HCAHPS*) and qualitative (nurse interviews (results in another study)) data collection techniques and authors state they were analysed for triangulation. **Unique Methods:** SSA was to quantitatively assess the visibility and accessibility within nursing units, linking spatial configuration to operational efficiency and staff communication patterns. **Longitudinal:** This study was structured as a multi-phase POE, extending over multiple years and incorporating multiple units. This design allowed for a continuous learning cycle that adapted and applied findings iteratively to enhance healthcare environments. Data was collected over a three-year period, offering a robust framework for assessing the impacts of design changes over time and insights more aligned with real-world use and adaptations.

			Interdisciplinary Collaboration: Key stakeholders, including healthcare administrators and architectural design teams, were actively engaged throughout the research. This facilitated a deeper understanding and integration of POE findings into practice, ensuring that the design modifications were informed by empirical evidence. **Participants:** Unlike other articles, all of the stated research methods are primary. However, the study lacks qualitative data from patients as only interviews were conducted with nursing staff. The CHD checklists would have been good to adapt into a survey as more relevant points related to wellbeing – the Press Ganey survey is very general.
Environmental Physical and Perceived Quality in Hospice **(Ferrante and Villani, 2021)**	Physical-spatial humanisation: Aspect/sense of welcome Accessibility Wayfinding Acoustic comfort Olfactory comfort Environmental comfort Visual comfort Privacy/environmental control	Patient and Family Survey (Adapted Perceived Hospital Environment Quality Indicators (PHEQIs) for hospice setting)	**Consideration of Setting Characteristics:** The framework was adapted for hospice settings to assess the perceived quality and humanisation of care environments. These included considerations of the particular uses, care practice and design qualities: appearance/sense of welcome, accessibility/use, orientation, environmental, visual, acoustic, olfactory, tactile, and privacy/control of the surroundings. **Standardised Tools:** adapted the existing perceived hospital environment quality indicators (PHEQIs) to suit the hospice settings. **Interdisciplinary Collaboration:** The study's methodology was developed with experts, including technologists and environmental psychologists, emphasising an interdisciplinary approach to refine POE practices. **Comparative Analysis:** A geographically diverse sampling of data from 8 independent hospices across Italy. **Wellbeing Focus:** the study considered preferences

			concerning their health status **Generalisability:** The surveys are related to the outdoors, communal areas, and patient rooms. The authors state that the same indicators could be used to assess all functional areas in the hospice to provide a more holistic assessment, which could, in turn, contribute towards planning guidance of hospice facilities. **Participants:** This study reversed the issue of many other articles, which focused on patients/families and did not collect staff perspectives.
The Role of Patients' Psychological Comfort in Optimizing Indoor Healing Environments: A Case Study of the Indoor Environments of Recently Built Hospitals in Sulaimani City, Kurdistan, Iraq **(Mahmood and Tayib, 2020)** Healing environment correlated with patients' psychological comfort: Post-occupancy evaluation	Privacy, Views, Comfort and control, Interior appearance, Family support, and Facilities.	Patient Survey Staff Survey (Likert Scale of satisfaction and degree of Importance) in-person site visits observations	**Standardised Tools:** The study uses a combination of the AEDET toolkit and an adapted ASPECT toolkit, allowing for a thorough assessment of various environmental factors influencing patient satisfaction. The adaptation of ASPECT involved reviewing existing theories of the healing environment (salutogenic perspective and supportive design). **Wellbeing Focus:** Emphasises the importance of psychological comfort alongside physical aspects of the environment, reflecting a holistic approach to post-occupancy evaluation in healthcare settings. The study accounted for the unique socio-cultural context of Kurdistan, which impacts patient expectations and experiences, highlighting the impact of socio-cultural perspectives on patients' views regarding the importance of factors in optimising healing environments **Multi-Method Approach:** Employed a combination of surveys, direct observations, and environmental assessments to gather a broad spectrum of data from patients and medical staff, providing a holistic view of the environment's impact. **Comparative Analysis:** The study's design included

of general hospitals **(Mahmood and Tayib, 2019)**			comparative analysis between two hospitals with differing physical environments and patient care philosophies, providing a deeper understanding of environmental factors on patient outcomes. **Hierarchical importance:** more comprehensive evaluation of the degree of importance of the factors influencing patients' satisfaction. **Generalisability:** although this was a multi-site study conducted in two units in two separate general hospitals, the results are still limited in generalisability **Participants:** The staff survey was focused on patients' psychological comfort rather than their wellbeing.
Perceived Importance of Wellness Features at a Cancer Center: Patient and Staff Perspectives **(Tinner, Crovella and Rosenbaum, 2018)** Perceived importance of wellness features at the Upstate Cancer Center: Patient and staff perspectives **(Tinner, 2016)**	Wellness features: ease of movement, art and murals, not seeing medical equipment, plants inside, access to roof garden, access to social space, natural lighting, views of nature, thermal comfort, access to private space, and access to quiet spaces (last is only on staff surveys).	Patient Survey Staff Survey (Likert Scale of satisfaction and hierarchy and open-ended questions)	**Wellbeing Focus:** The study focuses on a range of wellness features like natural lighting and indoor plants, evaluating their perceived impact on patient healing and staff productivity. **Comparative Analysis:** By comparing patient and staff responses, the study provides insights into how different user groups prioritise wellness features based on their roles and experiences in the healthcare environment. **Hierarchical Importance:** Participants were asked to rate each feature according to other outcomes such as improved interactions, healing process, ability to care, work focus, increased relaxation, mood, positive thoughts and reduced stress on a scale from one to five. This allowed an evaluation of the most important related to each area. **Consideration of Setting Characteristics:** Consideration of existing validated tools such as 'Berkeley Center for the Built

			Environment (CBE) Indoor Environmental Quality (IEQ)' but ultimately, these did not yield the specific data of interest about particular wellness features. **Interdisciplinary Collaboration:** Developing questions was done through building walk-throughs and conversations with architects and staff. Input from staff on readability and accessibility of survey – in addition to conducting a test with various groups. **Generalisability:** As the evaluation criteria were developed based on the original design intents, the generalisability of the results may be limited.
Evaluating Intention and Effect: The Impact of Healthcare Facility Design on Patient and Staff Wellbeing **(Alvaro *et al.*, 2016)**	(1) Impressions of the overall building design (Illness, connection to neighbourhood, nature, city, safety, opportunities to visit with others, ease of wayfinding, comforting, and cheerful), and (2) Sense of belonging. Wellbeing related to both groups (3) Optimism and (4) Satisfaction. Wellbeing related to patients: (5) Perceptions of improvement, (6) Depressive	Patients Survey Staff Survey Each of these relate to the number evaluation criteria: (1) survey of first impression with dimensions aligned with the design intentions. (2) use of visual images where they place a circle (representing themselves) related to connected to the neighbourhood, nature and city. (3) 10-item Revised Life Orientation Test (Scheier, Carver, & Bridges, 1994). (4) 19-item patient satisfaction scale (5 domains information, care, quality and safety,	**Wellbeing Focus:** The study adopts a novel post-occupancy evaluation approach by linking architectural design intentions directly with wellbeing outcomes rather than focusing solely on traditional health outcomes. Emphasises the psychosocial aspects of wellbeing, particularly social connectedness, which is less commonly the central focus in healthcare facility POEs. **Comparative Analysis:** Pre-post test with control: the new hospital, the former hospital, and a comparison facility. **Multi-Method Approach:** Various existing tools (original and adapted versions) have been used to assess different areas. For 11 areas (Evaluation Criteria) there are 11 methods that address it (Research Methods). Although a complex approach, it has been well-evidenced and reported, and the final surveys do not seem to be impacted by the complex design—lots of valuable data but lots of analysis to conduct manually. **Validates Original Design Principles:** The facility was based on patient psychosocial wellbeing needs with a focus on social connectedness, and the POE methodology operationalised this

symptomology, (7) Self-efficacy in mobility. Wellbeing related to staff: (8) Workplace burnout, (9) Intention to quit, (10) Interprofessional interactions, and (11) General well-being.

patient centredness, and the healing environment) based on literature review and developed by Malik, Alvaro, Kuluski, and Wilkinson and a 15-item staff based on feedback from staff on areas of concern in the existing hospital (work relationships and communication, cleanliness, safety, treatment, culture etc).
(5) measure of coping and adaptation (adapted from McFarland & Alvaro, 2000), with five domains of health: overall, physical, mental, social, and financial.
(6) adapted Centre for Epidemiologic Studies Depression (CESD) 10 (Andresen, Malmgren, Carter, & Patrick, 1994), the shortened version of the scale (Radloff, 1977).
(7) adapted 10-item Self-Efficacy in Wheeled Mobility Scale (Fliess-Douer, Van Der Woude, & Vanlandewijck, 2011)
(8) 22-item MaslachBurnout Inventory– Revised (Maslach,

as the theoretical basis of its evaluation criteria. It helps to validate the original design intentions.

Unique Methods: Use of visual images where they place a circle (representing themselves) related to connected to the neighbourhood, nature and city.

Generalisability: The unique nature of the cancer centre building may limit the generalisability of the results.

		Jackson, & Leiter, 1996). (9) 4 items on a 7-point scale (10) adapted items from the Attitudes Towards Health Care Teams Scale (Heinemann, Schmitt, Farrell, & Brallier, 1999): (11) 8-item Flourishing Scale (Diener et al., 2010)	
Evidence-based design in an intensive care unit: End-user perceptions **(Ferri *et al.*, 2015)**	atmosphere (natural light, noise levels), physical spaces (single occupancy rooms, clinical pods), family participation (support areas, social networks), and equipment (usability, storage, provider connectivity).	Staff, patient and family semi-structured interviews	**Comparative Analysis:** Conducted interviews in two phases (early and late), post-occupancy, to capture evolving perceptions and experiences as users adapted to the new environment. **Comprehensive Development:** Utilised in-depth, semi-structured interviews and iterative, reflexive qualitative analysis to identify key themes and sub-themes from end-user feedback. However, potential personal biases in the qualitative analysis were addressed by having an experienced external researcher review the coding process. **Participants:** Emphasised direct feedback from a diverse end-user group (healthcare providers, support staff, and family members) to understand the practical implications of design features on daily operations and wellbeing. **Wellbeing Focus:** Incorporated principles such as natural light, noise control, and dedicated family support areas into the design, evaluating their effectiveness through user perceptions. **Generalisability:** single-site study which could limit generalisability

Development of Hospice Environmental Assessment Protocol (HEAP): A post occupancy evaluation tool **(Kader, 2017)**	safety and security, provision of autonomy, continuity of self, privacy, social interaction, regulation of stimulation, spiritual care, access to nature, staff support, family accommodation, and support after death	Framework developed through literature reviews, expert interviews, and case studies.	**Consideration of Setting Characteristics:** The study adapted the Professional Environmental Assessment Protocol (PEAP) framework to develop HEAP, ensuring it was tailored to the specific needs of hospice environments. **Comprehensive Development**: This work is the outcome of an evidence-based thesis. Utilised a combination of literature review, expert opinions, and case studies to develop comprehensive evaluation criteria and checklists. Engaged in multiple rounds of interviews and case studies to refine and validate the evaluation tool. **Wellbeing Focus:** Addressed multiple dimensions of therapeutic goals, ensuring a holistic approach to evaluating the hospice environment. **Interdisciplinary Collaboration:** Collaboration with experts from different fields, including architecture and healthcare, to create a robust and comprehensive evaluation tool. **Matrix:** HEAP forms an evaluation matrix that can be adapted to create research methods that would form the basis of a POE, especially in hospice settings.
The Inclusion, Diversity, Equity and Accessibility audit. A post-occupancy evaluation method to help design the buildings of tomorrow **(Zallio and Clarkson, 2022)**	people-centred data (e.g., age, gender, marital status, geographical location, etc.) people-space perception (physical accessibility, such as location and spatial comfort, others based	Survey 1: initial Likert scale of people-centred, people-space perception and people dynamics perception information Survey 2: in-depth survey with same participants - when a response is below average there is multi-method feedback option (text, photo,	**Interdisciplinary Collaboration:** Utilised the Delphi method to gather and refine expert opinions, ensuring the inclusion of diverse perspectives in developing the IDEA audit. Conducted co-design workshops with building and construction industry stakeholders to collaboratively create and test the IDEA audit tool, emphasising user-centred design. **Multi-Method Approach**: Combined qualitative and quantitative data collection methods, such as surveys, interviews, and observational studies, to gather comprehensive

	on IEQ parameters and additional sensorial experiences including ergonomic configuration, spatial aesthetics, and maintenance and management) people dynamics perception (person-to-person engagement, including equity and inclusion, engagement with diversity, neurodiversity in space, mental and physical wellbeing, and behaviour and people's empowerment)	audio) Mixed-Method Framework: based on outcomes of previous surveys the researcher decides on methods (observation, task analysis, interviews and access and inclusion audits, environmental technologies etc)	feedback on building performance regarding inclusion, diversity, equity, and accessibility. Addressed subjective perceptions (e.g., emotional responses and subjective experiences) and objective metrics (e.g., physical accessibility and environmental quality) to provide a holistic evaluation of the built environment. **Comprehensive Development:** Employed an iterative development and validation process, continuously refining the tool based on feedback from participants and experts to ensure its effectiveness and relevance. **Consideration of Setting Characteristics:** collect more detailed information regarding the challenges experienced rather than just the overall attitudes to the building. This approach additionally helps to surmount the low answer rate from building occupants that other POE methods currently have. **Resource Intensive:** this methodology is resource intensive as it involved multi-methods and constant analysis of data to develop a unique methodology that will address the challenges identified through the feedback. It might require research expertise.
Ambulatory infusion suite: pre- and post-occupancy evaluation **(Shepley *et al.*, 2012)**	Social interaction, Privacy, Access to nature and daylight, quality of the environment for staff	Patient and Family Survey Staff Survey (Likert-style of satisfaction and importance, and open-ended questions)	**Comparative Analysis:** This study compared two different infusion suites, one old and one newly designed, to evaluate environmental features supporting patient interaction, privacy, and visual access to nature. **Consideration of Setting Characteristics:** Utilised a Practitioner-Focused Facility Evaluation (PFE) tool tailored for each of the three project's design goals, allowing for consistent and objective evaluation across different areas

			without creating a specific survey for each. **Multi-Method Approach:** Combined Likert-scale surveys with open-ended questions to gather comprehensive patient, family, and staff feedback about their environmental experiences. **Wellbeing Focus:** The study emphasised environmental psychology principles such as choice, control, and biophilia, recognising the importance of privacy, social interaction, and natural elements in healthcare settings.
Assessment of Healing Environment in Paediatric Wards **(Ghazali, 2010)** Healing Environment: Status and Design Trend of Pediatric Wards **(Abbas, 2009)**	physical qualities (character and innovation, form and materials, staff and patient environment, urban and social integration, performance, construction, engineering, use, access, and space) satisfaction (privacy, views, nature and outdoors, comfort and control, legibility of place, interior appearance, and facilities).	AEDET and ASPECT toolkits Patient, Family, Staff Survey Observations, Photographic documentation	**Multi-Method Approach:** Integrates quantitative data from structured questionnaires with qualitative insights from personal observations and photographic documentation, providing a holistic view of the ward environments. **Standardised Tools:** Utilised AEDET Evolution and ASPECT toolkits, modified into survey questionnaires, to ensure Standardised evaluation criteria across different hospitals. **Comparative Analysis:** A geographically diverse sampling of data from 8 hospitals in Malaysia. **Wellbeing Focus:** The study specifically aimed to understand how physical and non-physical environments contribute to the healing process, highlighting the importance of a holistic approach to design. **Longitudinal:** Analyses design trends of paediatric wards over three decades (1980s, 1990s, and 2000s), allowing for an assessment of how design evolution impacts the creation of a healing environment.

Establishing Psychological Wellbeing Metrics For The Built Environment **(Watson, 2018)**	Satisfaction (purpose, fulfilment) Affect (optimism, comfort, energy levels) Competence (copping, improved performance) Relatedness (socialisation, sense of value) Autonomy (choice, empowerment)	Building Wellbeing Scale: Multi-item scale for measuring wellbeing outcomes • Social Return on Investment (SROI): monetisation of the scores produced by the Building Wellbeing Scale.	**Standardised Tools:** Utilises a multi-item scale based on the SACRA model (Satisfaction, Affect, Competence, Relatedness, Autonomy) to capture a broad range of wellbeing outcomes. The first tool developed was the Building Wellbeing Scale, a combination of items from two existing tools: the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) and Questionnaire for Eudaimonic Wellbeing (QEWB). The second tool is Social Return on Investment (SROI), which assigns financial value to the outcomes from the Building Wellbeing Scale. **Unique Methods:** The SROI is a unique way to translate wellbeing outcomes into ROI. A ratio can then be determined that compares wellbeing value with, for example, building costs, i.e., the design fees, contract sum, and the furniture, fittings, and equipment (FF&E) cost. **Wellbeing Focus:** Emphasises the psychological aspects of wellbeing, **Generalisability:** although this is developed for general buildings, the specifics of the typology might impact the ROI value. **Resource Intensive:** although once set up, the data analysis process should be straightforward – developing these tools would be complex.
Exploring the Use of the AEDET Hospital Evaluation Toolkit to Create a Better Healing Environment for Cancer Patients	AEDET Criteria: Impact: Character and Innovation, Form and Materials, Staff and Patient Environment, Urban and Social	AEDET Survey ASPECT Survey Observations Photographic documentation Semi-structured interviews with architects and healthcare	**Standardised Tools:** The study operationalises the AEDET and an ASPECT toolkit to form surveys **Comparative Analysis:** Conducted in two different oncology hospitals **Multi-Methods Approach:** Utilises quantitative data from

beyond the Global North **(Tekbiyik Tekin and Dincyurek, 2023)**	Integration Build Quality: Performance, Engineering, Construction Functionality: Use, Access, Space ASPECT Criteria: Privacy, Company, and Dignity Views Nature and Outdoors Comfort Legibility of Place Interior Appearance Facilities Staff	professionals.	structured questionnaires and qualitative data from observations and interviews, providing a comprehensive assessment of the hospital environments. **Participants:** Engages a diverse group of stakeholders, including patients, staff, and professionals, ensuring that the evaluation reflects a wide range of perspectives and experiences. **Wellbeing Focus:** Emphasises the importance of evidence-based design and patient-centred care in creating healing environments, with specific attention to natural light, air quality, noise, and views.
Does the design of hospitals meet the needs of older people? An evaluation of three acute-care settings **(Barnes, Torrington and Lindquist, 2016)**	• Dignity and personal care • Privacy • Security • Safety and hygiene • Awareness of the outside environment • Comfort and control • Wayfinding • Accessibility • Physical support • Sensory support • Dementia/cognitive support	Site Visits Matrix Checklists	**Standardised Tools:** The pilot tool was adapted from existing validated tool that evaluate housing and care homes for older people: Evaluation of Older People's Living Environments (EVOLVE), EVOLVE for Vision, and the Sheffield Care Environment Assessment Matrix (SCEAM). In addition, healthcare tools include health building notes from the Department of Health; and Achieving Excellence Design Evaluation Toolkit (AEDET Evolution) and A Staff and Patient Environment Calibration Tool (ASPECT). **Comparative Analysis:** Conducted in three settings (six areas) representing typically acute-care pathways for older people, building types, and building ages: hospital (accident and emergency (A&E), the medical assessment unit (MAU), and the care for the elderly ward (CEW), inpatient

	• Staff needs • Visitor needs		rehabilitation hospital (main hospital and one ward) and a nursing home with some beds dedicated to intermediate care (overall building and the dementia unit). **Wellbeing Focus:** The evaluation tool categorised questions into dignity, privacy, security, wayfinding, and dementia support, ensuring a comprehensive assessment. **Consideration of Setting Characteristics:** Emphasis on the particular needs of older people, such as physical support, sensory support, and cognitive support, ensuring the built environment is responsive to these needs. **Matrix:** currently only developed as a checklist matrix to complete in a building walk-through. It has not yet been operationalised in research methods that collect data from building users.
A post occupancy evaluation of the Dundee Maggie Centre **(Stevenson and Humphris, 2007)**	user satisfaction, comfort levels (temperature, air quality, noise, lighting), functionality of spaces, and the building's physical performance in terms of energy efficiency and maintenance.	Staff and Volunteer semi-structured interviews Visitor Questionnaires Observations technical performance measurements (temperature, humidity, lighting, noise levels) analysis of fuel bills.	**Multi-Methods Approach:** Utilised a combination of qualitative interviews and quantitative surveys to comprehensively understand the interviews and explore more in-depth understanding behind survey responses. Combined technical performance data (e.g., energy use, physical measurements) with user satisfaction surveys to cross-validate findings and ensure **Standardised Tools:** Adapted the Building Use Studies (BUS) methodology, which focuses on user feedback about what works and does not work well in the building, providing a fundamental appraisal of design quality as directly experienced by users. Questions were also derived from AEDET and ASPECT **Wellbeing Focus:** two questions were added to the visitor questionnaire, derived from EORTC: sense of their own health

	and quality of life. Allowing a correlation between the self-reported quality of life and health ratings and the perception of building features. **Interdisciplinary Collaboration:** The study involved collaboration with architectural experts and healthcare professionals to ensure the evaluation methodology was robust and relevant to the healthcare context. BUS was supplemented with questions developed in collaboration with members of the project team and client representatives, who concentrated on comfort issues and work conditions. **Consideration of Setting Characteristics**: The evaluation considered the unique socio-cultural context of the Maggie Centres, emphasising its unique typology as a cancer-care centre where architecture is utilised to contribute to creating a healing environment.

Chapter 10
Discussion: Three Models of Hospice Wellbeing

The previous chapter presented findings derived from interviewing participants about their perspectives on various aspects of the hospice environment. In addition to the findings that informed the development of the novel Hospice POE Toolkit. Three broad themes were found to formulate a triad of aspects that influence wellbeing. To synthesise each: “fostering resilience” was characterised by social engagement, autonomy, choices, familiarity, and community; “creating thoughtful focus” highlights the design's ability to engage effortlessly and, in turn, reduce and distract from anxieties for those visiting or receiving care; and lastly “experience of holistic sensory environment” details people's interaction beyond the architecture, facilitated by the design, organisational ethos, and an aspiration to establish connections with nature. These themes can occur in combination but were distinct enough to reflect the participants' perceptions and experiences of the spaces, places, and interactions within the environment. These findings relate to the eudaimonic wellbeing of Ancient Greece, as explored in Chapter 2, which encapsulates positive psychological functioning, self-realisation, development, and individual growth, as opposed to the hedonic wellbeing of happiness, the absence of negative effect, and the presence of positive affect (Kesebir and Diener, 2009; Oishi, Diener and Lucas, 2009; Sirgy, 2012). This discussion can contribute toward research originality by building upon Ulrich’s Theory of Supportive Design from the perspective of the impact of a hospice environment on wellbeing, with three themes explaining people's

experiences.

This chapter reaffirms and addresses the research questions stated in the introduction (Chapter 1) by discussing the significance of the findings with reference to existing literature and theories as outlined in Chapters 3-5.

This study aimed to explore and analyse the opinions and experiences of those who used the hospice, including staff, volunteers, patients, family, and friends. The three research questions were:

- What methodologies are applicable to the measurement of the person-centred outcomes of a hospice environment focusing on wellbeing, and how can these be critiqued for their effectiveness? (Section 10.1)
- How do the design aspects of the Sengetun care model contribute to the establishment of a person-centred environment within the hospice inpatient unit? (Section 10.2)
- What other environmental aspects of the hospice contribute towards facilitating a person-centred environment? (Section 10.3)

10.1 What methodologies are applicable to the measurement of the person-centred outcomes of a hospice environment focusing on wellbeing, and how can these be critiqued for their effectiveness?

The key areas that contribute to addressing the research question in this section are; (1) Conceptual Framework and Philosophy, and (2) PPWH Hospice POE Toolkit.

10.1.1 Conceptual Framework and Philosophy

The conceptual framework presented at the end of Chapter 4 provided the theoretical structure that guided the study. One of the most important aspects of researching within both the architecture and clinical disciplines was to ensure consistency of language that could be understood from either discipline. This has been highlighted

by Salingaros and Masden (2008), Groeneveld *et al.* (2019) and Markus *et al.* (1972) as being a barrier to effective communication between design and clinical researchers. As Day (2007) highlighted, choosing an appropriate research design fusing the creativity of multifactorial design research with meticulously controlled clinical research was challenging. EBD guided the research to allow a flexible but systematic approach to providing credible evidence. Hamilton (2003) advocates EBD as a reliable resource to bridge the gap between the architectural profession and academia.

The methodology of Chapter 5 was built on these foundations by exploring the different standpoints taken by social scientists and architectural researchers as reflected by Friedmann, Zimring and Zube (1978), Fisher (2018), and Manuela Mendes, Sá and Cabral (2017). This research shaped the thesis methodology and influenced the research methods, concluding that a mixed-method case study was the most appropriate methodology for answering the research questions. The case study was effectively a building evaluation, influenced from both positivist (Yin, 2018) and interpretivist (Merriam, 2009; Merriam and Tisdell, 2015; Stake, 1995; Stake, 2003) perspectives. The researcher's interaction with the organisation, its staff, and volunteers led to the adoption of a constructivist paradigm. However, the emergent nature of the study's findings also necessitated the use of pragmatism. Consequently, the study adopts a constructivist pragmatist approach. Chapters 4 and 5, with evidence in POE methodologies, EBD, wellbeing, and a desktop review of the organisation's project and site observations, culminated in developing a novel Hospice POE Toolkit, a methodology grounded in the PPWH environment and focused on evaluating person-centred aspects related to wellbeing.

10.1.2 Hospice POE Toolkit

The creation of the novel Hospice POE Toolkit addresses multiple facets of the environment, ensuring a holistic evaluation. It was developed through experiences of the PPWH facility, Pilot Study, and building evaluation research and POE scoping review of Chapter 4. Initially, the Toolkit began as a series of research methods, subsequently gaining more detail throughout the development of the literature review

and PPWH site observations. It became apparent that the case study, organisation and building project were ingrained in human perspectives and collaborative working. Alvaro *et al.* (2016) Suggestion for healthcare research to focus on psychosocial wellbeing instead of the impact of buildings on traditional objective health outcomes resonated with the purpose of this study. The analysis of existing POE methodologies (Chapter 9) highlighted their limitations in exploring these areas and it was adapted to suit the specifics of the study, supported through EBD and wellbeing research. The design intention of the hospice facility informed the theoretical foundations for developing and evaluating outcomes, in addition to focusing the POE on various aspects of the design intentions of the proposed facility (such as enhanced access to nature and the outdoors). The novel Hospice POE Toolkit was informed by existing articles related to physical aspects of healthcare environments that impact wellbeing, such as noise, environmental comfort and walking distances if found relevant to the hospice environment.

The constructivist pragmatist methodology allowed freedom in how these tools were applied and how the data was analysed and reported, as advocated by Creswell (2018), Bishop (2015) and Goldkuhl (2017). Findings from this study do not rely solely on one research method but on a collection of methods that established a holistic picture of the environment. This approach ensures that the limitations of any particular method could be overcome by another source of evidence, as explored later in Chapter 11. For example, the restricted sample size for the survey could be mitigated through in-depth data gathered from personal perspectives and experiences of the environment.

10.2 How do the design aspects of the Sengetun care model contribute to the establishment of a person-centred environment within the hospice inpatient unit?

The novel Hospice POE Toolkit was used assess the Sengetun care model in relation

to establishing a person-centred environment and the findings show the environment supports various aspects of patient, family, friends, staff and volunteer wellbeing. The findings from the PPWH show a home environment was not only achieved through aesthetics but through a sense of "the everyday." The design and organisation of the Sengetun model help to facilitate this. The key areas that contribute to answering the research question in this section are (1) Person-centred design, (2) Environmental engagement, and (3) Decentralised units. Although important to note that EoL care is not the only provision at a hospice, Hospice UK reports that most EoL patients' preference to die at home is not achieved (Nilsson *et al.*, 2017): Therefore providing this sense of "the everyday" through not only replicating aesthetics but feelings of home should be an important considerations in hospices.

10.2.1 Person-Centred Design

The Sengetun model aimed to address several benefits through person-centred design and organisational changes. The findings of the previous chapter indicate that the model succeeded in meeting and even exceeding initial aspirations. For instance, the single ensuite bedrooms helped create a homely environment and promote independence, while family areas that facilitated open communication helped establish a safe and comfortable atmosphere. Overall, the model was successful in enhancing orientation, providing comfort, delivering privacy, enhancing communication, and ensuring safety for patients and families.

The findings of the study highlighted the importance of personal control over environmental conditions in establishing a homely environment. The study reports that the hospice provides independent and individualised control over elements such as light, heating, and ventilation, beyond the standard on or off controls. This allowed for adjustment to suit individual preferences on a wide spectrum, mitigating issues with fixed conditions. This was significant because fixed conditions, such as high or low light levels, can increase stress, fatigue, and low mood, as reported by Montague and Sharrow (2009). The ability to adjust environmental conditions according to individual preferences allowed for adjustable comfort in the

environment, promoting a sense of homeliness and comfort for patients. A frequently mentioned design feature was having direct access to a private garden patio, effectively replicated a front or back door in someone's home. This feature gave patients, family and friends the freedom to leave their own "space", small things achievable in a home environment but here with the added protection and safety of being in the hospice grounds while still surrounded by specialised staff and clinical equipment. Another important feature to many was that it facilitated unrestricted pet visits, which often visibly improved the patient's mood. In some instances, patients could retain independence in the bedrooms due to their adaptability and accessibility features, potentially surpassing what might be achievable in their own home environment.

In interviews, family and friends mentioned feeling comfortable visiting their loved one at the hospice and mentioned from past experiences a level of comfort they have not experienced in hospital environments. A "carer-centred" vision at the PPWH aligns with the ethos behind "family-centred" care, detailed by McCullough (2010) and Dellinger (2010). This was achieved in the IPU through dedicated family features, including sofa beds in the patient bedroom, dedicated family overnight rooms, central space, garden rooms to facilitate staff/family discussions, a family dining area, and gardens. A designated "family zone" within the bedroom areas and even the amount of space within the rooms allowed family and friends to feel comfortable and not feel like they were hindering staff care. Families and friends had the freedom to access the kitchens and gardens independently, without feeling like a burden or needing staff permission. This design feature helped to address the issue of a lack of control and independence, which can negatively impact dignity and make people feel like a burden on others, as described by De Jong and Clarke (2018) and Chochinov (2002). This independence allowed visitors to feel comfortable and at home, aided by the clever integration of clinical aspects within furniture or bed heads. The importance of providing private spaces for discussion was also acknowledged, aligning with the ethos of the modern hospice movement. The PPWH highlighted the significance of Glaser and Strauss (1967) open awareness context in giving patients and families autonomy over their health and wellbeing. The garden

rooms are the epitome of this and were frequently mentioned by family and friends as a safe space to share an open dialogue with staff regarding their loved ones and have direct access to the outside. Although many difficult conversations took place within these rooms, they are often referred to positively due to the striking interior design of the space, with research by Dijkstra, Pieterse and Pruyn (2008b) showing that perceived attractiveness can have stress-reducing effects. Preference towards the garden room also aligns with the positive distraction aspects of supportive environments as evidenced by Ulrich (1991). Another reason people might prefer this room was that it fosters open communication between staff and families, which was shown by Cohen and Leis (2019) as an essential aspect of positive wellbeing. Having access to a waiting area outside the bedrooms was a feature frequently commented upon, a space where waiting families had the opportunity to engage with other families, contributing towards resilience and supportive relationships. This could be used as a purposeful waiting area for family and friends to wait when patients received personal care, instead of waiting in a corridor, which could feel more like a passing space and again brings up the feeling of not being a space of "refuge". Not only used as a waiting space, but the findings also show that family and friends used this space to get outside the room with patients for a change of scene. Overall, these aspects of the design seemed to align with findings by Dellinger (2010) that dedicated family zones reduce stress, increase perceptions of privacy, and increase patient social support.

10.2.2 Environmental engagement

The Sengetun model's design of a small cluster of bedrooms centred around a social space and with direct access to the outside fostered a sense of connectedness, with multiple sources of engagement from the visibility of people walking outside to direct interaction with others in the social space or gardens. This was further supported through the communal family dining area, family rooms and young adult lounge.

Using single rooms met some of the benefits described by Ulrich *et al.* (2004); Ulrich *et al.* (2008), finding they provided suitable privacy and reduced noise levels,

particularly during the hours of the night. However, although Singh *et al.* (2016) found single rooms can increase loneliness and social isolation, Anderson (2007) found acoustic isolation might exacerbate this. This was not highlighted as an issue in the hospice. The "quietness" of the inpatient unit was frequently mentioned, although, unlike findings by Anderson (2007), the quiet didn't lead to feelings of isolation for patients. One staff member commented that the inpatient unit was "quiet, but not silent". Although quiet in terms of noise production, the findings suggest glass panelled doors oriented towards both the outside and inside provided a connection with the world beyond the room and helped mitigate feelings of isolation. Many commented on watching nature and wildlife outside or appreciating the ability to watch the activity in the central space. Access to a window with a view outside was a feature found by Ulrich *et al.* (2004); Ulrich *et al.* (2008) to have the ability to reduce feelings of isolation and increase connections with nature, allowing for a therapeutic effect. The act of visually connecting with activities beyond the immediate room fits with Totaforti (2018) findings in that multisensorial design can be seen to support wellbeing. It also demonstrates that it is essential not just to consider one element, such as providing quiet or a view of nature, but that these elements should be interconnected and layered to establish a compounding effect.

10.2.3 Decentralised Units

The decentralised model for the Sengetun facility featured open workstations similar to early Planetree facilities described by Montague and Sharrow (2009). Nurses' stations were designed as dining tables in a central open space, making it easier for staff to be accessible to patients and families. This design was highly effective in establishing a strong sense of safety for patients and families, but staff had varying views on the space. All staff found it localised them to the patients and reduced unnecessary time spent off the unit and patients, families and friends found it easy to locate staff when needed. However, some staff found that the open nature of the workstation could, at times, interrupt work requiring concentration.

Although the laptops used for patient notes were intended for individual workstations in each patient room, the poor Wi-Fi signal meant that they were often used at the

central dining table or main office space, where an ethernet cable was available. Some staff felt that families might perceive them as not working, but this was not the intended purpose of the space. The experiences described by staff suggested a lack of control over their environment due to this, which could lead to feelings of being constantly "on-demand". However, the survey findings showed that 89% of IPU staff and volunteers were satisfied with their ability to take a break and have time alone without feeling on demand. This was facilitated due to the abundance of dedicated staff spaces throughout the IPU. Therefore, the findings seem associated with uncontrollable stimuli only during working hours, which had been found by Glass and Singer (1972); Levy-Leboyer (1982); Moser (1988); and Sherrod (2006), to increase agitation and decreased productivity, with Enes (2003) finding repeated exposure leading to learned helplessness. The design and layout of the staff table were fully accessible on all sides, which may have contributed to the staff feeling interrupted while working on specific tasks. To address this issue, incorporating biophilic design features of "refuge," as suggested by Browning, Ryan and Clancy (2014), could be beneficial. This would involve providing some element of protection from the flow of activity, such as having a space in an alcove or with a wall, which could help resolve staff's feelings of being interrupted while working on specific tasks.

One of the aspirations of the Sengetun model was to reduce walking distances. Walking distances averaged 5.73 miles during a day shift and 3.83 miles during a night shift, similar to findings in a study by Welton *et al.* (2006). However, staff did not raise any concerns about these distances during interviews. It seemed that the length of walking distance was less important than the amount of unnecessary walking. Some staff could feel more fatigued during the winter, when they were arriving at and leaving work in darkness. However, rather than walking distances, the most prominent comments/concerns raised by staff related to the perceived level of natural light and air circulation in the central space of each bedded unit. This was reflected in IPU staff and volunteers rating the natural light and ventilation levels at 50% and 60% “low” and “too low”, respectively. The monitoring devices did not pick up on adverse indoor air quality conditions in the central space, which had

similar readings to bedrooms where 84% and 92% of IPU patients and families reported natural light and ventilation levels at “just right”, respectively. Therefore, it would seem that staff perception of poor natural light and ventilation could be specific to their working area, with much of their time spent in the central space. This negative perception could also be due to the central space having no direct windows for light or views outside. Therefore, rather than measurable poor levels of indoor air quality leading to negative perceptions and discomfort as found by Settimo (2017), these findings suggest negative environmental stimuli led to the perception of poor indoor air quality. This could relate to the findings by de Dear and Brager (2001) and Brager, Paliaga and De Dear (2004) that greater control over environments leads to greater flexibility with accepting environmental conditions typically outside personal comfort zones. These findings suggest that perhaps greater access to natural light and views contributed to an illusion of control, even though no physical control was exerted. It is also important to note that this space was envisioned to establish a calming atmosphere through low-level lighting, floor lamps, soft indirect natural light from bedroom spaces, and overhead skylights. It could be speculated that the overcast conditions of the Scottish climate meant these indirect sources, from bedrooms and skylights, provided lower levels of illumination and a gloomier atmosphere than had been originally anticipated. The bedded units could relate to the biophilic features of Frank Lloyd Wright’s Johnson-Wax building, as described in Section 3.7; a commonality being the central space had been designed as a calming environment with filtered top light, capable of generating a similar response as would be found in the midst of a dense forest. This could be seen to offer the feeling of a space of refuge and give the ability to step into the private bedrooms, with more access to natural light but without losing the feeling of security.

The lowered ceilings in the central space and bedrooms helped to reduce noise transmission from other areas of the hospice, with the exception of the IPU reception where some noise was still audible. However, this was not a major concern as it was mainly a hub of noise-generating activities like family dining. The design complied with Egan, Hass and Jaffe (1997) recommendation to have thresholds between noise-sensitive and noise-producing spaces. One intentional architectural feature was the

lowered ceiling heights, from the central space to the bedrooms, making it feel like a more secure space manifesting Browning, Ryan and Clancy (2014) sense of "refuge". The panoramic views of both inside and outside from the bed mirror findings by Raanaas, Patil and Hartig (2012) that patients use this as a space to withdraw.

10.3 What other environmental aspects of the hospice contribute towards facilitating a person-centred environment?

The novel Hospice POE Toolkit was successfully used to evaluate all aspects of the PPWH facility, showings it flexibility to be applied. The PPWH environment incorporates various design aspects that support the wellbeing of the patients, families, friends, staff and volunteers. The key areas that relate to the research question in this section are; (1) Open space, (2) Connection, (3) Control and choice, (4) Restoration, and (5) Culture, context, and lived experience.

10.3.1 Open Space Exploration

When entering the main reception, there are no barriers to accessing the reception desk, as seen in (Figure 9-1). Unlike typical paperwork-filled hospital receptions, the space was purposely kept clutter-free. Staff observations and visitor feedback suggest that those visiting felt comfortable exploring the space, browsing the shop or going to the café without feeling restricted. This seems to support the theory by Kaplan and Kaplan (1989), that presenting people with manageable visual information (the designed appearance), void of negative distraction, can lead to a restorative environment, as it allowed people to explore with comfort and confidence. The "greeter" in the reception area supported the act of wayfinding by providing directions or escorting people around the space, which from the staff's perspective, provided a positive experience, aligning with establishing Montague and Sharrow (2009) findings that a less formal queueing system with fixed information desks created a welcoming and reassuring environment. The expansive floor to ceiling windows with access to natural light throughout the circulation routes may have

contributed to the welcoming and open feeling of the building, something also acknowledged by Montague and Sharrow (2009).

An “openness” to the building was mentioned in relation to all spaces, from the main reception area to the corridors and patient spaces. The openness can be observed in people’s reflections on their journeys throughout the building, for example, to the IPU bedrooms. The route contains limited signage, with three open “thresholds” supporting wayfinding and always visibly containing a staff area. These open thresholds enabled people to navigate the environment without feeling lost or stressed, which was acknowledged by Ulrich *et al.* (2008) and Ulrich *et al.* (2004) as a desirable outcome of clear wayfinding. The limited signage, especially negative signage indicating a staff space in the hospice, mirrors Montague and Sharrow (2009) advice that to aid wayfinding and comfort, the design of private spaces should blend into the background to allow the public spaces to be the most prominent. The concept of openness could be attributed to the Orians and Heerwagen (1992) Savanna Hypothesis, stating that people are drawn to open environments with areas of protective trees or canopies as they can achieve long range sight lines from vantage points for observation of threats from a safe space. As well as relating to the Savanna Hypothesis, the “openness” of the hospice reflects effects described by Browning, Ryan and Clancy (2014) in the biophilic design element of “prospect” which emphasises the importance of uninterrupted views for good sightlines to the next threshold but where there was still visibility of a staff space additionally providing a sense of security in an unfamiliar environment.

Many of the windows in the building offer unobstructed views of the surrounding landscapes, which aligns with the Savanna Hypothesis. This idea is supported by research conducted by Herzog and Bryce (2007), which suggests that views with long distances (over 30m) can increase awareness and comfort. This was apparent in the findings, with people drawn to the views over the lawn on the eastern side of the building, affording the ability to watch wildlife and children playing, instilling a greater sense of awareness and focus. Although it was not possible to achieve the same long focal lengths within the building, the same concept by Herzog and Bryce

(2007) could be applied, as the hospice's design incorporates seating areas and artwork that people can notice while traveling around, which contributed to their sense of awareness and focus. Patients, families and friends describing their wayfinding experience within the building showed a reduction in anxieties and allowed visitors and patients to feel welcomed and valued.

Furniture and artwork appeared to provide a focus throughout the building. Although findings did not suggest this directly aided wayfinding, they were vividly remembered by those accessing the facilities and contributed to positive distractions for people travelling around the building. This, in turn, could make routes through the building more memorable. There were also opportunities to sit and reflect throughout the building circulation, allowing for the ability for people to travel at their own pace, and positive distractions to establish "inclusive" and stress-free wayfinding. As advocated by LaHood and Brink (2010), these should be facilitated through "cues" responding to all people, languages, and disabilities. The ease of wayfinding and positive distractions mirror the features of fascination and coherence, which Kaplan and Kaplan (1989) and Ulrich (1991) deem essential to a restorative environment.

The mystery and discovery of views throughout the hospice gardens produced curiosity for patients and families exploring the spaces. The topography was a unique feature throughout the grounds, designed to provide a glimpse of certain building features or the context of the surrounding landscapes, such as city views. This aspect of complexity or elevational changes adds curiosity, hypothesised by Ulrich (1983; 1986) to be environments instinctively preferred by humans. "Mystery" is a biophilic feature by Browning, Ryan and Clancy (2014), providing an environment to discover, understand, and explore. If out walking with a patient or client, this was beneficial for building on the relationship, as it added an aspect of effortless attention (Kaplan and Kaplan, 1989). This supports findings by Cooley *et al.* (2020) that therapy in nature can aid in relationship building and enable a deeper connection to be formed between the practitioner and the self. The walking and talking therapy utilised by family support services reported that clients often opened up quickly as

they could bring up aspects of the environment to discuss, which led to other conversations. The freedom for clients to choose their preferred walking route instilled a sense of autonomy. Having sessions outside allowed clients to bring their dogs for a walk, which built confidence and independence and often provided that additional sense of support. These findings could help to effect change in the conclusions of a meta-synthesis review by Cooley *et al.* (2020: 11), that limitations to achieving outdoor therapy can be overshadowed by a preference towards "traditional cartesian clinical approaches".

10.3.2 Connection

The findings suggest that the open plan nature of the building offered numerous opportunities to engage and connect with others throughout the building. Informal interactions with the various staff throughout the building contributed to the patient and family experience of the space, continuing these positive interactions out with the services they were accessing. One of the significant benefits of the building was the creation of space for peer support, either informally through the corridor breakout spaces or in areas such as day services, the café or staff dining room, break areas and shared office space. Not only was there the opportunity of forming these connections but also the ability to provide diverse levels of engagement and control over these. For example, in the gardens, there was choice to chat in the open spaces or sit alone in a more secluded spot; similarly, if you wanted to be around others you could go to the café or social space; or if you needed time alone you could use the bedrooms, garden rooms or sanctuary. One example was in the Day Lounge, with the open plan zoning allowing people to sit as part of a group but also avoiding the need to be actively involved in the group activity. This level of choice over social engagement was shown in the findings to be beneficial for the various levels of connections individuals required for certain situations – either a need to be part of a group or that of being alone and reflective. This control was identified by Ulrich (1991) as important for social support, as everyone had different ways to benefit from social engagement – either as a passive observer or someone more involved. which pointed out a lack of evidence regarding healthcare design features that promote access to social support. The hospice's design was not only about providing space but also

focuses on the variety of space and its open plan nature to encourage engagement, both formal and informal, and support social interaction. By incorporating a mix of spaces that facilitate social support, the hospice's design enables patients, families, and staff to interact and connect in different ways, contributing to positive health outcomes and overall wellbeing.

10.3.3 Control and Choice

As mentioned by Ulrich (1991) in Chapter 3, the means of individual control in an environment or situation is related to a need for self-efficiency. This can be evident within the hospice, as rather than control or choice, participants often referred to the environment's ability to adapt to the specific needs or requirements of the user. This control or choice was also shown within the hospice to be linked to a sense of purpose and self-worth, evident in the accessible inpatient bedrooms, allowing patients and their families to gradually become accustomed to the help provided within the environment rather than an overreliance on staff or the assistance of volunteers. Having increased choice within the environment also led to people discovering new interests or rekindling old ones, such as creative pursuits or gaining confidence that may have been lost in everyday life. The accessibility of the grounds, wide pathways, level access, flat surfaces and the integration of accessible features all contributed to an inclusive and supportive journey for people of all ages and abilities. This planning allowed patients and families to access the grounds independently and thus explore by themselves. The entrances and exits of the building have been designed to accommodate a range of preferences on privacy levels and accessibility. For example, the direct exit from the family support suites offered a private exit from the building, allowing for sessions to be taken outside and for people to bring pets in for additional support.

An example of sense of control being important to positive wellbeing was seen in the comments on temperature, with some acknowledging that even when temperatures were out-with ideal preferences, the personal control over environmental elements such as controlling thermostats, opening windows and closing blinds, allowed this to be more tolerable. For example, gathering around the fireplace as a heat source or

momentarily stepping out into the balconies for fresh air and cooler temperatures was beneficial for maintaining a comfortable environment. Findings from the study were consistent with de Dear and Brager (2001) and Brager, Paliaga and De Dear (2004) that individuals are more satisfied with environmental conditions that are outside of their comfort level when they have personal control over them. In contrast, in an environment where people have no control over the conditions, they can quickly become agitated and attribute any discomfort to the building's inefficiency.

Overall, the findings suggest patients, families and staff perceived the hospice environment provided a good sense of control, something Zolkefli (2017) reports can be lost when dealing with progressive or unknown illness trajectories. These findings contradict the study by Andrade and Devlin (2015), which found no correlation between provision of elements of control in healthcare environments and stress reduction. Perhaps this can be explained through two limitations in their studies, namely that their research methods provided a floor plan with a list of elements rather than a real environment and used a sample of students with no direct experience of healthcare environments. The study at the hospice therefore counters their limitations and suggests that their sample might not represent the physiological and psychological conditions experienced by hospitalised patients. The findings from this research suggests that things people can often overlook everyday choices, such as the ability to open a window or control temperature. Simple things, that in the hospice, has been shown to contribute to improved wellbeing. This study highlights the imperative on the designed environment to provide familiar experiences of everyday human functioning.

10.3.4 Restoration

People can experience overwhelming emotions during their time at the hospice. The landscape design considers this by being flexible; to allow people to seek an area that supports their current emotions. For example, the walled seating can be used individually while feeling protected by the planting or to establish a social atmosphere with the curve of the wall allowing people to have an open view of everyone and equally contribute to conversations. The peacefulness of the gardens

was often mentioned with aspects of feeling ‘hidden’ and being able to process thoughts, which aligned with findings by Ulrich et al. (1991, 2019) that people retreat to natural settings when troubled, upset or grieving. The garden patio was mentioned by one visitor, “that it feels like you could be anywhere” and felt refreshing, aligning with Kaplan and Kaplan (1989) research that a sense of “being away” plays an essential role in attention restoration theory. The patios also saw patients and their families getting actively involved in “decorating” them with bird feeders or plant arrangements.

The hospice's seasonal gardens, which display plants and flowers in bloom year-round, were found to encourage exploration and foster a desire to revisit the gardens to witness changes throughout the seasons. This desire may be linked to Orians and Heerwagen (1992) suggestion that growth signifies the availability of future resources and instils feelings of hopefulness and contentedness. Additionally, as suggested in the study by Korpela and Ylen (2009), repeated exposure and interaction with nature can promote restoration by fostering a sense of “place attachment” and the establishment of a “favourite place”, potentially enabling individuals to form a more profound personal connection with the hospice and supporting them through various emotional challenges. The same study found that engagement and mindfulness tasks in natural environments support sustained attention (Korpela and Ylen, 2009). These types of tasks were explored by the hospice in the form of a regular walking group, allowing people to observe or interact with the surrounding environment and take part in organised activities such as: looking at the plants in bloom and tracking their progress, picking apples and sharing them, and participating in group activities involving nature, music and dancing. The findings provided a perspective beyond aesthetics or access to technology and towards sensory experiences, relationships, and the support of human functioning, achieving the Planetree philosophy vision of creating “A journey of the senses, experienced from arrival to departure”, which grounds people and keeps them present. These elements, in particular, relate to nature, from the connection between outside and inside, the ability to see and hear wildlife, touch the planting and flowers in bloom, have vistas of nature, smell the seasons, to the ability to pick and taste fruit

– straight from the trees. Participants' descriptions of their experiences suggest a fundamental human need to engage, connect, and feel part of something beyond their illness. This highlights that design features such as single rooms and wall art alone cannot create a person-centred environment but can compound to contribute to a holistic sensory experience of space. The walking group could be considered a form of ecopsychology, a therapy defined by Clinebell (1996) and said to deepen a sense of connectedness with nature and address areas of alienation. Many patients took inspiration from the gardens for their work in the Art Room, mirroring the findings by Wittmann (2010) that being in gardens or active gardening can increase creativity and cognitive flow. It had also been seen by staff as a way of enabling patients to take creativity out of a room's confines and undertake self-motivated creativity outside through the pursuit of recreational activities like photography.

Not only did the design facilitate connections with other people, but the accessibility to the outdoors allowed people to explore connections with nature and, at the same time, reflect on themselves. When in the building, people often mentioned observing the local wildlife, detailing how their attention was momentarily drawn away from their work; one particular example detailed watching the birds. This could relate to Kaplan and Kaplan (1989) suggestion that the movement of clouds, sunsets, and trees can hold a real fascination, in turn, providing a moment of restoration. Observation of the changing in the gardens and keeping track of, or even looking after, the wildlife seems to be a significant contributor to positive distraction in the findings, which was related to Ulrich's suggestion that one of the most effective positive distractions connects to human evolution. This observation of nature was highlighted by Browning, Ryan and Clancy (2014: 27) to be beneficial to connect with "living systems and natural processes".

The accessibility of the hospice was not limited to physically accessing the outside, but also to having a view of it. Even patients who were too unwell to go outside reported feeling a benefit from being able to see the gardens and observe children playing. Findings by Raanaas, Patil and Hartig (2012) that people tending to "retreat" to patient bedrooms with panoramic views mirrored findings within the Day Lounge,

with its wrap around views of nature from three elevations resulted in feeling involved in surrounding activity without actively participating. This could be connected to Kaplan and Kaplan's "effortless engagement" aspect of a restorative environment. However, this seems to expand beyond engagement with outside nature. Other aspects, such as the fireplaces, unique design features, or being able to passively observe others such as in the café, instilled a similar sense of engagement. There were unique design features such as the bay style windows, known as hanging windows (Figure 9-29), that allowed people to be immersed in nature and the furnishing and artwork focus, engagement and discussion points throughout the building. These features could align with Kaplan and Kaplan's "sense of fascination". In addition, the fireplaces are both a practical and novel "traditional" heating source, referencing Nightingale (1860; 1863) recommendations for a healing environment. This offered a supplementary heat source and created a cosy, homely atmosphere; people gather around to socialise or get lost in thought by observing the flames. Patients with life-limiting conditions can especially be sensitive to the cold, so it was a valuable feature for providing instant and visible warmth.

The balcony areas (Figure 9-56) are one unique aspect of the hospice, particularly within the Scottish climate, which provided the benefits of being outside without having to leave the building, aligning with findings by Cooper Marcus and Barnes (1995), Francis and Cooper Marcus (1992) and Francis and Cooper Marcus (1991). In addition to the café and Day Lounge balconies, there are dedicated balconies beside the staff offices, most of which are terraces and not overlooked by patient areas. These allow for socialisation space and the ability to step out of the building for restoration during breaks. This mirrors findings by Naderi (2008) that nature and gardens should be designed to benefit both self-reflection and socialisation of staff. Uniquely, the hospice had addressed the barriers which prevent staff from going outside, such as perceived lack of time, by having these balconies immediately accessible from offices. These breaks are essential for staff when dealing with emotive issues, an everyday aspect of working in a palliative care environment. The findings support those by Hartig, Mang and Evans (2016) and van den Berg *et al.* (2010) that nature restores focus and reduces adverse effects caused by mental

fatigue and stress, in addition addressing the often “overlooked” staff wellbeing found by Ulrich (1991) in “patient-centred” hospitals.

10.3.5 Culture, Context and Lived Experience

Glaser and Strauss (1965) findings that stigma around hospices is systemic due to misinformation and anxiety around death and dying, is still visible in the anecdotes shared by day patients and reinforced by staff observations of patients and families prior to coming to the hospice. The research findings show that these barriers are surmounted by engaging with the building. This engagement can be achieved by using the education suite, public café, gardens, and shop, or participating in one of the community events. This enables people to experience the environment without being a patient and helps to break down barriers while encouraging educational initiatives and engagement. The building offered collaboration opportunities that were mutually beneficial for patients and organisations and broke down barriers for external collaborators and the public. This evidences Montague and Sharrow (2009) proposition of the vital role communities can play in the healing process.

The findings reveal that people made frequent connections between aspects of the hospice and their lived experiences and memories. When making that initial visit, one of the first things mentioned was the hotel-like features, which were apparent throughout the building. The reception area contributed to a feeling of being a hotel lobby, a space to relax instead of just waiting. Another space that instilled this comparison was the IPU, allowing for independent access to a tea and food preparation area, having space in bedrooms for personal belongings and dedicated spaces for spending time in a pleasant environment, alone or with others. These findings reinforce those by Suess and Mody (2018) that healthcare environments containing hotel-like features can create a sense of comfort and control in the environment.

The hotel-like features are not the only aspect of ‘familiarity’ that people attach to the environment. In one instance, even the exterior aesthetics of the building offered a past connection with someone’s sense of peacefulness and calm, attaching these to the façade feeling “like a church”. The interior design references culture and

surrounding context, both directly and indirectly: plaques for rooms sponsored by local businesses and organisations and features of interior design such as the purple and tartan upholstery representing the Scottish culture (Figure 9-33 and Figure 9-44). These elements and other unique aspects provided positive distractions and focus for those moving around the building, the benefits of which can be seen in the fond, vivid memories family and friends recounted of the hospice and the elements that created focus. Even the activities within the building, such as the creation of art, allow patients to rekindle past experiences or hobbies, with one patient even turning a negative experience of art creation in their past into a positive one at the hospice. (Young, 2007) study found that, as design is subjective, the connection to it can be created through people's perception, cognition and physiology. The findings show that for patients, family and friends, emotional attachment towards specific aspects of spaces or design features of the environment seems to be facilitated through personal experience people attribute directly or indirectly to the hospice. This also supports findings by Orians and Heerwagen (1992) and Balling and Falk (2016) that preferences towards specific environments can stem from experiences, which builds emotional attachments. As found by De Jong and Clarke (2018), a "life lived well" was considered essential in coming to terms with death and dying. Although these are specific to this environment and individual, it highlights factors related to site context or culture that can prerequisite a positive response and a connection to the space.

The whole space aligns with Totaforti (2018) aspirations for modern healthcare to express culture and social values and not just be a space for medical intervention, the merging of these being complex, but something achieved through the strong organisational culture. It was important to acknowledge that the project initiation and actualisation are strongly related to the hospice's organisational culture, as discussed in Chapter 8. Involvement with consultation, fundraising events and even initial design development allowed for a vested interest in the project's success and people's sense of connection to the building – even before occupation. This provided further evidence to support Salonen *et al.* (2013) findings of the importance of consultation with all user groups and multidisciplinary design teams for successful

person-centred projects. As previously mentioned, the study by Korpela and Ylen (2009) on “place attachment” and “favourite place” establishment could be paralleled in the hospice’s endeavour to involve users in the project. Although their study focussed on experience of physical exposure, it suggested similar attachments can be formed from being included as part of the development of a project conceptually.

10.4 Conclusion

As an exploratory discussion, this chapter addressed the research questions and evaluated how findings related to previous literature and theory. The wellbeing of staff, volunteers and families had always been an essential consideration for the organisation, making this a priority even within the initial design consultations (Pert *et al.*, 2013b). This reinforced Leather *et al.* (2016) findings that the care team can contribute to positive design changes, emphasising the importance of placing equal value on both care providers and recipients, an essential aspect of person-centred care according to Stichler (2001). The concluding chapter will reflect on the limitations of the research design and offer recommendations for practice, as well as implications for future research.

Chapter 11
Conclusions

This thesis has highlighted architecture's role in facilitating the physical, psychosocial, and emotional wellbeing of those within a palliative care context. It provides evidence for establishing a therapeutic environment that supports person-centred care and questions modern healthcare's emphasis on medical advancement, reconnecting us to our historical roots. This concluding chapter synthesises the answers to the research questions of the previous chapter. It addresses the research design, study limitations, contribution to new knowledge and implications for practice and future research.

11.1 Answering the Research Questions

What methodologies are applicable to the measurement of the person-centred outcomes of a hospice environment focusing on wellbeing, and how can these be critiqued for their effectiveness?

Establishing a conceptual framework for this study provided a systematic critique of existing POE methodologies. Resulting in the development of a novel POE Toolkit which fuses the disciplines of architecture and healthcare inherently grounds the study in the case. Using existing literature and direct experience of the organisation and environment under study ensures that it addresses person-centred outcomes specific to the case while retaining academic rigour.

All aspects of this thesis are intrinsically linked to the mixed methods case study

methodology, which allowed flexibility for the emergent nature of the findings to adequately address and answer the research questions. The chosen methodology, literature reviews, and continual engagement with the organisation significantly influenced the constructivist-pragmatist paradigm research design and development of the Hospice POE Toolkit. This ultimately allowed the findings to be grounded within the case itself, using a person-centred methodology for determining person-centred aspects of the hospice environment.

How do the design aspects of the Sengetun care model contribute to the establishment of a person-centred environment within the hospice inpatient unit?

Chapter 1 introduced the Sengetun as a physical and organisational person-centred care model. With roots in the Planetree philosophy, it was adapted from the model utilised in St Olav's Hospital to suit the clinical requirements of a specialised palliative care environment.

In summary, the Sengetun care model was designed to create an environment that supports patients, families, and friends by incorporating various design features that enhance their overall experience. By prioritising personal control and multisensory design, Sengetun created an environment that feels like home rather than a hospital. The availability of family features, such as sofa beds and a garden room, ensures that families feel included and supported during their stay. The decentralised units and workstations create a sense of community and connection, while the lower ceiling heights contribute to a sense of comfort and privacy. The access to a private garden patio and views outside provided patients with an opportunity to connect with nature and engage with their surroundings. Overall, the Sengetun care model highlights that it is possible to create a person-centred environment in hospice care by offering familiar experiences of daily human functioning, promoting a sense of connectedness and engagement, and reducing feelings of isolation.

What other environmental aspects of the hospice contribute towards facilitating a person-centred environment?

Many of the building's other services and public aspects played an important part in the experience of patients and families. The findings go beyond the experiences of inpatient unit patients and families, providing perspectives from day patients, those accessing family support services and staff and volunteers.

The hospice environment was designed to create a sense of comfort and safety, with large windows providing access to natural light and furniture and artwork that provided a focus on journeys. Walking and talking therapy helps build relationships and independence, with the open plan design allowing opportunities for engagement and connection with others. This was especially important for those who may feel isolated or lonely, as it allowed them to find support and connection in a safe and welcoming environment. The space also provided control over social engagement, allowing for either group participation or reflective time alone, which provided patients with a sense of autonomy. Individual control in the hospice environment was linked to a need for self-efficacy and purpose, evident in the accessible inpatient bedrooms and grounds. People are more content with conditions out of their comfort level when they have personal control over them, as seen when gathering around a fireplace or stepping out onto a balcony. Gardens, balconies, and unique design features provided peacefulness, connection with nature, and a sense of engagement for patients and staff. The fireplaces, views of nature, and seasonal aspects of the gardens support restoration, focus, and hopefulness.

Involving patients, families, and staff in the design process to create an environment tailored to their needs was essential to ensure that the hospice environment was truly person-centred and conducive to physical, emotional, and spiritual wellbeing.

11.2 Addressing the Research Design

11.2.1 Conceptual Framework

The conceptual framework described in Chapter 4 helped to guide all aspects of the research design and ensured the focus remained on the studies aims.

11.2.2 Methodology

A mixed methods case study methodology was used to answer the research questions. This methodology was influenced by early discussions with PPWH staff regarding their care philosophy. One tool utilised by the hospice was the IPOS, which systematically recorded individual psychological, emotional, and spiritual needs that are integral to improving clinical outcomes in palliative care. The IPOS found that elements important to the patient and their impact on their clinical scores were not always dependent on treatments or care received but on personal human factors. This person-centred approach at the hospice influenced the decision to focus on person-centred aspects of the environment for this study. These person-centred aspects focused on wellbeing, something often overlooked or not systematically recorded in traditional healthcare but proven to contribute to outcomes in palliative care. This methodology was found to be flexible but rigorous enough to gather evidence-based design (EBD) research (Cohen and Leis, 2019; Hamilton, 2003; Hoskins, 2008; Ulrich *et al.*, 2004; Ulrich, 1991; Ulrich *et al.*, 2008), a concept first documented as early as Florence Nightingale's empirical observations of wards in 1860 and 1863. The research findings presented in Chapter 9 were based on a thematic analysis of interview data supported by quantitative survey statistics and environmental monitoring analysis. The discussion chapter then positioned the findings in relation to existing literature and theory, answering the research questions.

11.2.3 Data collection

The methodology allowed the research to adapt creatively, finding the best answer to the research question and going beyond the limitations of solely quantitative or qualitative research methods. The conceptual framework and PPWH POE Toolkit enabled data collection to follow a systematic process based on existing literature on building evaluations and environmental factors impacting wellbeing. The research methods closely follow the domains and evaluation criteria of the Hospice POE Toolkit. The study focuses heavily on the qualitative findings, much like the study by Devlin, Andrade and Carvalho (2016). However, unlike their aim, this thesis attempts to understand the underlying wellbeing principles and human processes that

underpin a person-centred environment rather than a documentation of individual elements which contribute to it.

11.2.4 Ethics protocol

The study received ethical approval from the University of Strathclyde Ethics Committee and the NHS Research Ethics Committee. The research team followed strict protocols to protect the participants' privacy, confidentiality, and dignity. The informed consent process was emphasised, and all participants were provided with written information and the option to withdraw at any time. The detail provided in Chapter 6 summarises what was often a complex process fraught with the experience of a novel researcher and the main question: was this research a service evaluation? It was evident that the study required ethical approval due to the vulnerability of participants. Although NHS approval was only required for research involving patients, family and friend interviews were considered, with the same protocols used. This ended up being beneficial as it was family and friends who became most upset throughout the interviews, highlighting the need to give equal importance to the welfare of this group within a study.

11.3 Limitations

Some study limitations were anticipated from the beginning, while others became apparent throughout its duration. Anticipated limitations were acknowledged and addressed within the research design and study protocol (Appendix 1), although some emergent limitations could not be mitigated. The main limitations are detailed below.

Multifactorial influences: previous research had indicated that environmental perceptions are shaped by a range of factors, including individual differences and preferences, making it difficult to establish clear cause-and-effect relationships. The findings of this study suggest that organisational influences on the environment are also significant, as highlighted in Tyson, Lambert and Beattie (2002) research on the challenges of separating physical design from organisational changes. Therefore, it would be inappropriate to interpret the findings solely in terms of design, given that

many departments underwent significant organisational changes. As a result, the discussion and conclusions offer a holistic explanation of what contributed to creating a person-centred environment, such as the “open” layout that facilitated both wayfinding, and the creation of social support.

Single-site study: an aim at the beginning of this study was to undertake and pre-and-post occupancy evaluation of the organisation, replicating data collection in pre- and post-move to establish benchmarking. However, due to the very distinct nature of the two buildings (one a retrofitted building and the other a purpose-built one), the organisational changes required to suit the new care model, and the slight variation in data collection methods meant that the results gathered from the Pilot Study in the pre-move building were unable to be directly comparable with the results from the post-move building without significant amounts of bias. Therefore, this thesis has not included data from the Pilot Study.

Findings not generalisable: The researchers were aware of the potential limitation of generalising the findings from a case study, as pointed out by Stake (1995). This was because the case study's uniqueness can make it difficult to apply the findings to other contexts. However, since the building in question was a unique collaboration designed specifically for the needs of the organisation, rather than a standard healthcare process for a “one-size fits all” approach, the researchers decided to conduct a detailed exploration of people's experiences and perceptions of the environment to better understand its impact. In addition, the iterative nature of the study, generating data and reviewing existing literature simultaneously, allowed the findings to be compared with existing research. These were explored within the previous discussion chapter, which informed implications for practice, with a best practice guide for establishing person-centred healthcare environments. In addition to providing guidance for future facilities, the Hospice POE Toolkit and associated POE methodology have been described to allow replication of the study within other hospice environments, the findings of which do not identify a specific design element but instead allow organisations to embed their findings in the context of their case, thus determining what is essential for establishing a person-centred environment in

their facility.

Positive bias: the findings present an overwhelmingly positive account of the hospice, more within the interviews than the surveys. It could be viewed that those who volunteered to contribute through social media, newsletter and poster requests already had more positive experiences of the building. The staff gave some criticism in interviews, but it was insufficiently evidenced to warrant standalone themes. Instead, critical reflections are presented in the most relevant theme, aiming to identify conflicting individual differences in responses to the environment.

Limited direct patient and family perspectives: it is clear from the sample population that staff outweighed patient, family and friend data for interviews and surveys. This was because the recruitment of staff was easier to initiate and follow up on. In contrast, patient and family recruitment relied on posters, social media/newsletter posts, and general information circulated by staff. There was visible staff support with recruitment; however, it was often challenging to identify suitable "well patients" who met the inclusion criteria and were interested in participating. The recruitment of patients, family and friends was also curtailed by the emergence of COVID-19 and lockdown, with access to that group becoming even more challenging, with recruitment and interview procedures requiring an alteration, as detailed in Chapter 6. This came with new challenges, such as those being interviewed not having accessed the building for months, maybe having fewer emotive memories and a less strong response due to having to think back. This was shown in the accounts given being less detailed than those of staff, resulting in aspects that participants stated they could not fully remember. As no patient or family interviews took place before lockdown, it was difficult to determine if the same data would be collected. In addition, it could be that staff would give more detail, due to their continuous experience with the space. This was a limitation that could not be accounted for.

Under-resourced: the Pilot Study of the existing facility highlighted limitations within the data collection methods. This allowed modification of these in the new facility, an example being the use of paper-based and digital surveys, which

considerably increased participation. Even though this was the case, there was not an overly large sample size; therefore, the quantitative data may not be as convincing as it might otherwise be. However, due to the available sample size being initially small due to the facility's scale and the population's vulnerable characteristics (i.e., dealing with progressing illness, family distress, unexpected events, etc.), this might be expected. This limitation was overcome by the qualitative data providing rich insight into the environment. The number of research methods employed (interviews, surveys, environmental monitoring) to establish a holistic overview of the facility might have led to some of the data collection methods being under-resourced and, therefore, not as successful as if it was the focus of the study.

Researcher limitations: Much time was spent on ethics due to the healthcare environment being an unfamiliar research field. Aspects of identifying and addressing ethical issues, as detailed in the research protocol of Appendix 1, such as ensuring people did not feel pressured to participate, were reflected in interviews. One example, in the pilot interviews, was that questions were vague and consequently did not always produce the expected response. However, avoiding leading questions impacted how questions were framed and followed up with prompts. The 13 interviews conducted for the Pilot Study allowed the researcher to develop and hone interviewing techniques. Confidence with interview skills improved, avoiding leading questions while maintaining a conversational narrative with participants. This helped to establish a less pressured, more informal atmosphere, with participants feeling more comfortable sharing their experiences as the interview progressed.

As with any study, these limitations can contribute towards the advancement of topics within this area of research. In addition, determining and encountering these limitations throughout the study contributed towards the personal development of the researcher and served as a means to document these for future reference.

11.4 Contributions to New Knowledge

This research has contributed to evidence-based design (EBD), building evaluation

studies, and person-centred healthcare design. A mixed-method case study was employed, revealing essential characteristics of the meaning structure of the everyday experiences of staff, volunteers, patients, family and friends within a hospice setting. This contributes to a better understanding of different perspectives towards the same environment and the way in which design can respond to all needs of those who use the building, as outlined by Ulrich (1991). This helps to shed light on the importance of designing for social, psychological, and physical needs to achieve a holistic approach to delivering a person-centred healthcare environment. A conceptual framework was developed to guide the study, contributing to building evaluation studies. This formed a novel Hospice POE Toolkit which can be flexibly applied to other hospices and healthcare settings and provided evidence to support a more holistic person-centred approach instead of the standard quantitative techniques utilised within traditional post-occupancy evaluations (POEs). In addition, this research has begun to address the often overlooked relevance of research focusing on qualitative methods. In contrast to previous research, which had primarily focused on general design elements, this research delves deeper into understanding why people might experience them differently and how this can be achieved within other person-centred focused projects.

This thesis contributes to knowledge in non-clinical research in clinical environments by developing an ethics process based on novel techniques and processes derived from multiple sources. This new process was based on the perspectives of organisations, palliative care researchers, and palliative care settings and considers the lack of precedence in the use of NHS ethics. The documentation of this process provided a framework for future non-clinical research in clinical environments and contributes to the ethical considerations of such research.

This research contributes to the field of knowledge by providing empirical evidence that documents and evaluates the person-centred Sengetun Model, which seeks to restore the “holistic patient-centred focus that medicine had lost” (Hansen and Jensø, 2009). Instead of technology-driven modern healthcare systems, we should revisit our historical and fundamental requirements for basic human functioning. Salingaros

and Masden (2008) further proposed that intuitive design has always been based on culture and human needs, including biophilia. The findings of this research show that the hospice environment at the PPWH had been successfully designed to reconnect to these historical roots. Browning, Ryan and Clancy (2014) explored three responses to biophilic design, which induced cognitive, psychological, and physiological features within the findings and discussions. Cognitive functioning was addressed through memories evoked through real-life experiences, which the hospice prompted patients to reflect on. The nature of the facility inspired their creativity - seemingly positively contributing to their wellbeing. Psychological functioning was related to the focus the environment establishes through space for time alone with nature or within the various breakout spaces – allowing for timeouts and processing of thoughts. Finally, although physiological responses overall were not tangibly measured, the perception of patients and staff suggest elements of mystery and risk can act as talking points, mitigating any opportunities for stressors to come into play. Overall being able to respond and adapt to individual preferences in each category was essential to successfully creating a person-centred environment at the PPWH.

In addition, to determine person-centred aspects of this care model, the findings contribute to knowledge in the field of supportive design by introducing the concept of “the everyday” as an essential feature of a supportive environment. The study's findings indicate that elements such as TV, artwork, and controllable windows and temperature should not be considered in isolation but rather in the context of the complex experience of the overall setting. Understanding this complexity could lead to improvements and developments that optimise the physical, social, and psychological environment and foster a more person-centred environment. This study provided evidence for the importance of considering “the everyday” when designing and implementing supportive environments and how it can improve individuals' physical, social, and psychological wellbeing in a given setting. Furthermore, this research contributes to the theoretical development of Ulrich’s Theory of Supportive Design by highlighting the importance of “the everyday” as a standalone category in the framework, which can provide insight into how supportive environments can be optimised.

11.5 Implications for Practice

The implications for practice related to healthcare design and creating person-centred environments can be applied by various stakeholders, including architects, healthcare organisations, design teams, healthcare boards and policy makers.

11.5.1 Person-Centred Principles

The contribution of empirical research on the Sengetun care model could provide much needed evidence for the NHS as they shift focus towards a person-centred model of healthcare, as outlined in their Long Term Plan. EBD already plays a role in NHS guidance with the Procure22 framework developed for NHS England, using empirical research within the development of their designs. Reflection on the discussion in Chapter 10 allowed the development of recommendations for establishing person-centred principles that could be applied across healthcare services. The starting point was the creation of person-centred organisational goals and aspirations, as seen in Chapter 8, which provided a solid foundation on which to create a person-centred environment.

Culture and context: Relating design to culture and context helps people connect to the building, feel comfortable and reflect on positive memories. The findings show that high-quality and cohesive interior design can offer a sense of distraction and focus and make people feel valued, making the facility an attractive place to work for staff and volunteers. In addition, unique design features can offer talking points and engage people.

Adaptability: the facility should be flexible to suit additional activities or emotional needs for those accessing it, including more secluded areas and large open areas for socialisation. The site's topography can create a sense of intrigue and wonder, making people want to explore the environment and engage with their surroundings. Easy and level access to the outside, accessibility aids and elements that can double as seating, such as low-level walls that blend in with the landscape design, can provide additional support for people who prefer to access the outside independently. Sheltered areas within the gardens can protect from adverse weather and the sun, as

many treatments can leave people with skin sensitivities, thus affording as much time to be spent outside as possible.

Restoration: Providing direct views from the building onto natural landscapes, especially achieving views of nature from the patient bed, can facilitate effortless attention and lessen feelings of isolation. Incorporation of balconies can offer the benefits of outside in a safe and secure space for those on upper floors, without having to exit the building physically. Open plan layouts and expansive glazing to create transparency and connection to the outside can allow people to feel engaged with their surroundings while offering personal space. Additionally, it is vital to allow people to orient themselves throughout the building and not feel claustrophobic.

Empowerment: Incorporating direct interaction with nature into services such as growing food or feeding birds can improve wellbeing, allow people to engage with wildlife and foster a sense of fulfilment. Sufficient circulation and integrated accessibility aids allow people autonomy while supporting staff to provide care without having to work around the environment. Various furniture choices in inpatient bedrooms can suit different activities, contributing to a sense of comfort and choice. Wide circulation routes, corridor breakout spaces and integrated accessibility aids allow people autonomy to walk comfortably at their own pace while also providing destination spaces to go or places that facilitate informal social engagement. Manually operated environmental elements can contribute to a sense of control, allowing people to feel comfortable in the space, even when slightly out of their ideal comfort preferences.

Community: A central social space in a bedded unit provides several benefits: an informal meeting space for family members, which contributes towards building resilience; a work environment for staff and volunteers who can have direct access to all rooms and monitor activities; and a space to step out of the bedroom for patients, family and friends and still be in a comfortable environment. Integration of an independent shop, cafe and gardens that are open to the public can create distraction and intrigue while providing a sense of normality, breaking down barriers and

allowing patients and families to feel part of the wider community.

Openness: Open plan layouts and small units with visual access to all bedrooms from one central space can foster intuitive wayfinding and allow staff to be visible and accessible. Decentralised nurses' stations, especially in more relatable forms such as a dining table, offer an informal atmosphere and allow staff to feel more accessible for patients and families.

Dedicated visitor space: Zoning in the patient bedroom for families, staff and patients allowed people to feel comfortable in the space, encouraging more frequent visits or staying for extended periods by ensuring everyone had a place without feeling invaded or invasive. The provision of dedicated family areas provided respite, allowed people to feel valued, and had space to take time alone and restore. In turn, it contributed to family resilience and enabled them to be fully present with care and support for those around them. In turn, facilitating the visitation of family pets can contribute positively to wellbeing and can be achieved by providing easily accessible outside space, particularly direct access from bedrooms.

11.6 Future Research

The research findings provide a strong basis for understanding which aspects of the environment contribute to wellbeing and demonstrate how individual preferences influence the use of space, such as gardens being used for reflection and socialisation. To further build on these findings, future research could investigate smaller aspects of the environment and examine individual differences in a wider sample. Notably, many interview participants reported that their participation in the study helped them reflect and become more aware of the person-centred aspects of their environment. This suggests that further research could be conducted using a more individualised approach.

Additionally, investigating the influences of the organisational changes that accompanied the implementation of the Sengetun care model would be advantageous. This could involve a qualitative study of the experiences of staff and patients during the transition from the traditional ward environment to the

decentralised Sengetun model, as well as a comparative study of the staff and patient satisfaction and wellbeing in both models. Finally, it would be essential to investigate the generalisability of the Sengetun care model to other palliative care settings and patient populations. Further research could investigate the implementation of person-centred design in other healthcare settings beyond hospice care. This could involve exploring the potential benefits and challenges of implementing a person-centred design approach in other healthcare contexts, such as hospitals or nursing homes, and whether the positive outcomes in the hospice setting can be replicated. Furthermore, it may be worthwhile to investigate the cost implications of implementing a person-centred design approach in healthcare settings. While the benefits to patient wellbeing may be indisputable, assessing the economic feasibility of such an approach is crucial to determine its potential for widespread implementation. Overall, there is significant potential for further research in the area of person-centred design in healthcare settings, and the findings of this study provided a valuable starting point for future investigations.

11.7 Final Reflections

The initial aim of this research was to investigate the design process of a hospice project and conduct a POE to evaluate the realisation of the brief aspirations, with a particular focus on the Sengetun care model. However, as the research progressed, the researcher and organisation realised the importance of focusing on the person-centred aspects of the facility and the lived experiences and perspectives of patients, family, friends, staff, and volunteers. Therefore, the research was co-produced to develop a novel Hospice POE Toolkit which would evaluate the person-centred aspects of the facility, supported through existing literature on POE methods and EBD.

This concluding chapter addressed the research design, limitations, contribution to new knowledge, and implications for practice. The study has contributed to new knowledge by developed a novel Hospice POE Toolkit that assesses the person-centred design elements contributing to wellbeing in a hospice environment. It has also highlighted the importance of co-production in research and the need for

customisable research methods. Limitations included the small sample size and the focus on a single hospice facility. Implications for practice include the need for person-centred design in hospice facilities and the importance of considering the lived experiences and perspectives of patients, family, friends, staff, and volunteers in the design process.

This thesis supports Nightingale (1860) statement, “Medicine is the surgery of functions, as surgery is that of limbs and organs. Neither can do anything but remove obstructions: neither can cure: nature alone cures...nature heals the wound”. The term “nature” relating to the physical requirement for greenery and is also connected to the three mind-body systems of biophilic design identified by Browning, Ryan and Clancy (2014) of cognitive functioning, psychological, and physiological response. The common thread throughout the findings and discussions was that person-centred aspects of the hospice environment always appeared to relate to some form of basic human functioning. These findings have been made generalisable for future projects, acknowledging that each project will have a unique set of aspirations. Even the incorporation of more achievable features, such as elements of environmental control, provision of both private and shared space, and incorporation of community aspects, can positively impact wellbeing. Ultimately, consideration should be given to a more holistic approach when designing healthcare environments, which can be achieved by fostering strong, open and trusting relationships between design teams and organisations: working together to provide a person-centred environment that focuses on the wellbeing of not only the patient, but everyone involved in the caring process.

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Appendices

The appendices listed below can be found as a separate upload found at the following link: https://doi.org/10.15129/4aa97650-ae29-4b2c-bc5f-71d54badec85

Appendix no	Document Title
Appendix 1	Research Protocol
Appendix 2	Consent Form
Appendix 3	Participant Information Sheet
Appendix 4	NHS Ethics Approval
Appendix 5	Semi-structured Interview Prompts
Appendix 6	Patient/Family/Friend Survey
Appendix 7	Bellahouston: Timetable and Location of Environmental Monitoring
Appendix 8	**Bellahouston Floor Plans**
Appendix 9	**Carlton Place Floor Plans**
Appendix 10	**Bellahouston: Graphs of Satisfaction with the Environment**
Appendix 11	Bellahouston: Noise Graphs
Appendix 12	Bellahouston: IAQ Graphs

Note: Only appendices pertinent to the collected research data (showing in bold in the above table as 8-10) are included within this document.

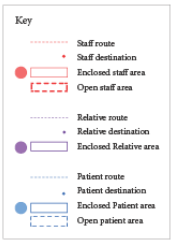
Appendix 8:

Bellahouston Floor Plans

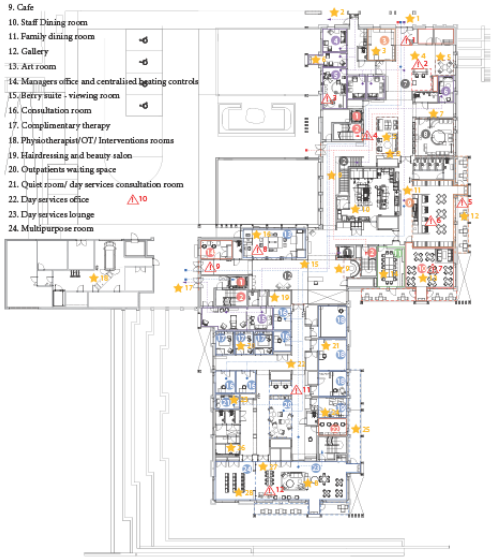
First floor – Offices
1. Lift
2. Stairs
3. Void
4. Cloakroom
5. Training room
6. Education suite seating
7. Outdoor terrace
8. Toilets
9. Meeting room
10. Library
11. Outdoor terrace
12. Changing rooms
13. Breakout space
14. Printer and stationary
15. Staffroom
16. Tea facilities

Stars
1. Ability to separate room
2. Good having a bookable space for income generation
3. Good access to natural light within corridors
4. Lots of office space for temporary staff
5. Large changing and showering facilities
6. Good amount of meeting rooms
7. Balcony is useful for meetings outside/ access to nature
8. Good space for private conversations meeting rooms

Wishes
1. Offices with no windows
2. Centralise printing - difficult to access for a quick printing
3. Noise can travel down the voids
4. Exposure to sun

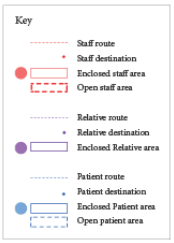


Ground floor – Entrance
1. Lift
2. Stairs
3. Gift shop
4. Counselling rooms
5. Claire's room
6. Eddie Lloyd room
7. Reception
8. Sanctuary
9. Cafe
10. Staff Dining room
11. Family dining room
12. Gallery
13. Art room
14. Managers office and centralised heating controls
15. Berry suite - viewing room
16. Consultation room
17. Complimentary therapy
18. Physiotherapist/OT/ Interventions rooms
19. Hairdressing and beauty salon
20. Outpatients waiting space
21. Quiet room/ day services consultation room
22. Day services office
23. Day services lounge
24. Multipurpose room



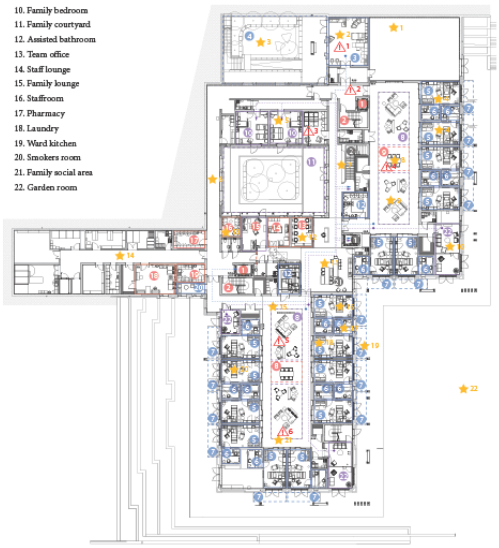
Stars
1. Old door from existing building provides emotional attachment
2. Private exit for PSS
3. Shop provides patients Independence to shop
4. Meet and greeter opening the door for everyone
5. Variety of seating arrangements
6. Unique spaces offer different focus
7. Tribute tree from Carlton Place, emotional connection
8. Fireplace as a focal point
9. Informal places for time alone or time to chat
10. Adequate kitchen facilities to expand current services
11. Public access to cafe is breaking barriers
12. Access to outside good in summer
13. Staff cafe to allow for private conversation with colleagues
14. Beneficial to have bookable dining room for events
15. Good to have gallery displays of artwork
16. Lots of even light in art room
17. Direct exit from Berry suite
18. Ambulance can enter the building privately
19. Beneficial Store for the art room
20. Complimentary therapy rooms will use, could be used for external use
21. Lots of adaptable rooms to suit needs
22. Can walk along corridor without feeling rushed
23. Comfortable and relaxing room for intial contact with services
24. Hairdresser and beauty salon offering multiple choices
25. Good access to outside space from the services
26. Standards similar to changing places toilet standards
27. Potential to be a space used by external organisations
28. Separating rooms beneficial for running different services simultaneously

Wishes
1. Can't access entrance independently
2. Public don't always check in at reception
3. Interior design not adequate for demographic
4. Door swings into the corridor
5. Narrow balcony - could have been deeper
6. Can get noisy in the cafe
7. Can be a cool space due to the windows, no blinds so can get hot in summer
8. Fixed layout in art room, not as accessible for a larger wheelchairs
9. Not accessible for those with dexterity issues
10. Turning circle tight in car park
11. Noise can echo along the corridor
12. Layout of furniture sometimes feels fixed



Lower Ground Floor – IPU

1. Lift
2. Stairs
3. Young adults lounge
4. Young adults courtyard
5. Patient bedroom
6. Ensuite
7. Patient garden space
8. Central social space
9. Staff desk
10. Family bedroom
11. Family courtyard
12. Assisted bathroom
13. Team office
14. Staff lounge
15. Family lounge
16. Staffroom
17. Pharmacy
18. Laundry
19. Ward kitchen
20. Smokers room
21. Family social area
22. Garden room



Stars

1. Use of store for expansion
2. Suited to YA needs and collaboratively designed
3. accesible courtyards dedicated to YA use
4. Dedicated YA bedrooms
5. Lots of space for families
6. Good natural light in corridors
7. Good informal breakout areas
8. Social area good for staff to observe patients
9. Social area good for families to socialise with other families
10. Garden rooms good for family meetings
11. Dining area good for family socialisation and dinners
12. Private office for writing up or conversation
13. Staff can have a private lunch near IPU
14. Good to have areas for additional storage
15. Good to have self contained ward
16. Good to have everything for patient care in room
17. Ensuite for privacy and dignity
18. Space for overnight visitors in room
19. Good to encourage engagement with nature in private gardens. Even views for those who can't manage outside
20. Ceiling hoist make job easier
21. Patient bedrooms easy to find once on wards
22. Children playing outside and enegaing with nature

Wishes

1. YA lounge far away from day services
2. Trouble with automatic doors been too sensitive
3. Under used sensory room - poteinal to explore
4. Staff can be interrupted while working at desks
5. Patients don't have space to socialise with each other on ward
6. Not as much natural light in central social spaces

Key

- Staff route
- Staff destination
- Enclosed staff area
- Open staff area
- Relative route
- Relative destination
- Enclosed Relative area
- Patient route
- Patient destination
- Enclosed Patient area
- Open patient area

Appendix 9

Carlton Place Floor Plans

Basement floor plan showing typical routes taken through the building

Basement Floor Plan

1. Changing rooms
2. Stair access to GF
3. Lift access to GF
4. Staff room
5. Staff office
6. Meeting room
7. Laundry
8. Staff garden area
9. Mortuary
10. Layout room

Issues

1. Broken staff shower
2. Staff room too far from IPU, poor views and dark
3. Layout room was 'back of house' and not a nice route for families
4. The two meeting room were often booked
5. Bars on windows of office and view of wall

Positives

1. Staff Room gave staff a private space to discuss things and socialise with colleagues
2. Small garden area for staff to use

Key

- Staff route
- Staff destination
- Enclosed staff area
- Open staff area
- Relative route
- Relative destination
- Enclosed Relative area
- Patient route
- Patient destination
- Enclosed Patient area
- Open patient area

Ground floor plan showing typical routes taken through the building

Ground Floor Plan

1. Rear entrance
2. Front entrance
3. Reception
4. Lift to IPU
5. Stairs to IPU
6. Stairs to basement
7. Dining room
8. Large lift to IPU
9. Cafe
10. Access to basement
11. IPU staff W/C
12. Stairs up to IPU
13. Counselling rooms
14. Art room
15. Hairdressers
16. Day lounge
17. Sanctuary
18. Complimentary therapy room
19. Consulting room
20. Large inpatient shower room
21. Eddie Lloyd room
22. Garden Patio
23. Rear car park

Key

- Staff route
- Staff destination
- Enclosed staff area
- Open staff area
- Relative route
- Relative destination
- Enclosed Relative area
- Patient route
- Patient destination
- Enclosed Patient area
- Open patient area

Ground floor plan showing issues and positives

Issues

1 Front entrance: not accessible

2 Reception: can be congested at the desk, due to sign in process and loud

3 Private conversation could take place in cafe, where there was no privacy.

4 Art Room: limited space for accessibility

5 Appearance of route to meeting rooms wasn't great

6 Staff w/c: located off the ward and issues with tight corridor/doors

7 Butterfly Room: decor not suitable for demographic

8 Large bed lift: takes patient straight up to the ward - can be disorientating

9 Rear ramp: although accessible very long and not same positive experience as front entrance

10 Large patient shower room: takes staff off ward

11 Isolated location of consulting room

12 Visibility of ambulances and undertakers

13 Pressing access buzzer can be difficult for those with limited dexterity

14 Poor access to parking

15 Accessibility restrictions within garden patio

16 Noise transfer between rooms within day lounge, which can impact on people who are distressed or having upsetting conversations

17 Old-fashioned appearance of day lounge and patterned carpet

Positives

Favourite space

1 Reception: welcoming, good social space and can see everyone who's in the building

2 Eddie Lloyd room: good for families and discreet with access close to an exit

3 Art Room: provided focus away from illness and instilled a sense of purpose

4 Counselling Rooms: area for tea/coffee within space

5 Was good to have some access to outside

First floor plan showing typical routes taken through the building

First Floor Plan

1 Lift/stair access to GF
2 Nurse stations
3 IPU office
4 Seating area
5 Drug room
6 Large store
7 Duty room
8 Western club lounge
9 Family lounge
10 Smoke room
11 Shower rooms
12 Ensuite
13 Arjo bath
14 Patient single bedroom
15 Patient bed area

Key

Staff route
Staff destination
Enclosed staff area
Open staff area
Relative route
Relative destination
Enclosed Relative area
Patient route
Patient destination
Enclosed Patient area
Open patient area

First floor plan showing issues and positives

First Floor Plan

Issues

1 Large Store: away from ward

2 Narrow corridors in certain areas

3 Small ramp between ward sections

4 Ward office: small and one computer

5 Inconsistent ward temperature and high noise levels on ward at night

6 Seating area: used for handover

7 Single room: has no windows

8 Shower room: used for storage

9 Limited space for overnight visitors within the ward

10 Nurse station: distracting and no privacy

11 Drug room: disconnected from ward

Positives

Favourite space

1 Western club lounge: nice relaxing room, away from ward

2 Duty room: used for private conversation and time alone

3 Ward is a good place to socialise with other patients/ relatives

4 Good view from ward

5 Smoke room: good for choice

6 Family room: good for large families and children

7 Seating area: break/social area used by staff

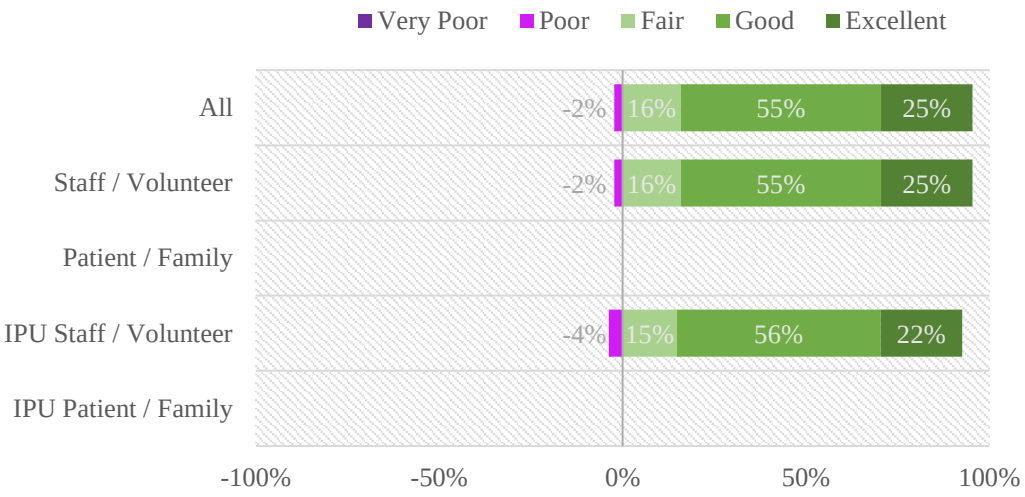
8 Single room: large and bright with ensuite

Appendix 10

Bellahouston: Graphs of Satisfaction with the Environment

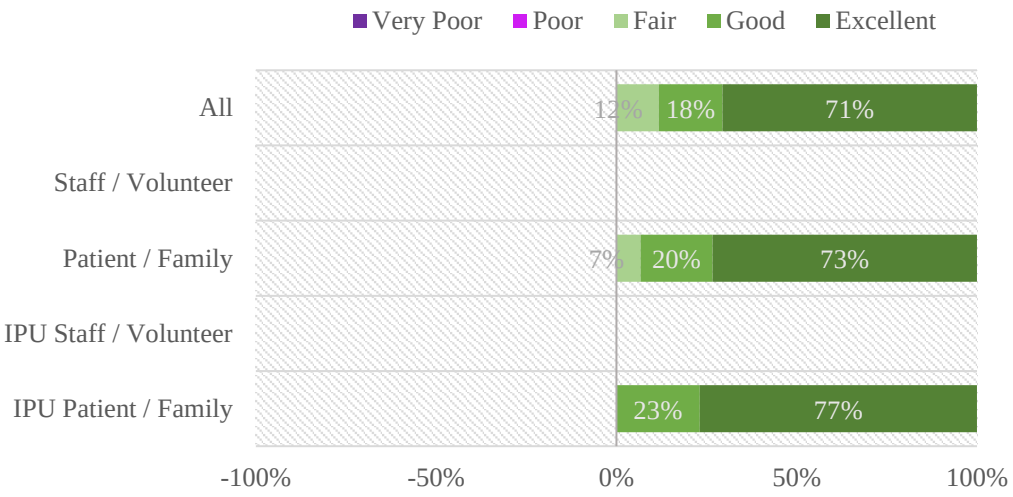
Respondents' perceived level of social engagement

Respondents' satisfaction with space for talking with colleagues, away from patient, client or family areas.



Staff / Volunteer Users gave a 98% satisfaction rating for space for talking with colleagues, away from patient, client or family areas.

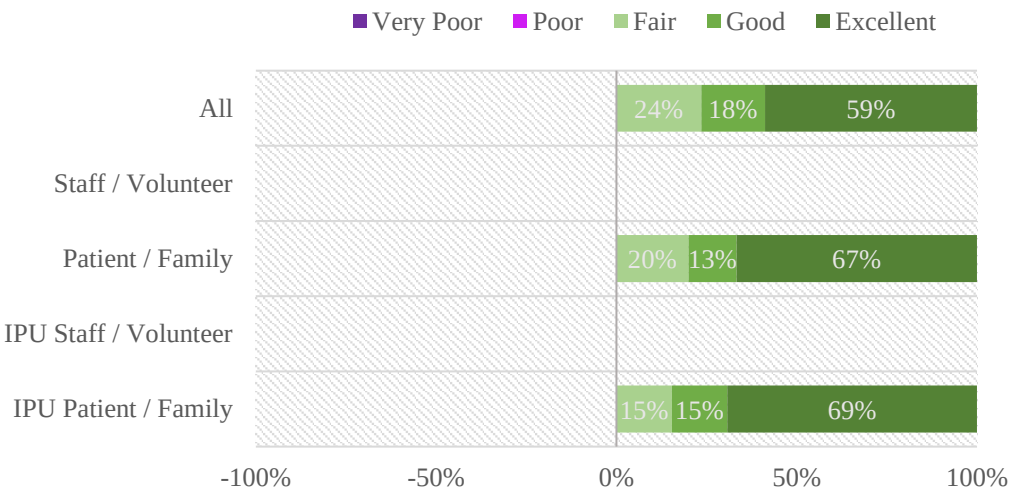
Respondents' satisfaction with space for socialising.



Patient / Family Users give our 100% satisfaction rating for space for socialising, 71% of which was rated “Excellent”.

IPU Patient / Family Users gave our 100% satisfaction rating for space for socialising, 77% of which was rated “Excellent”

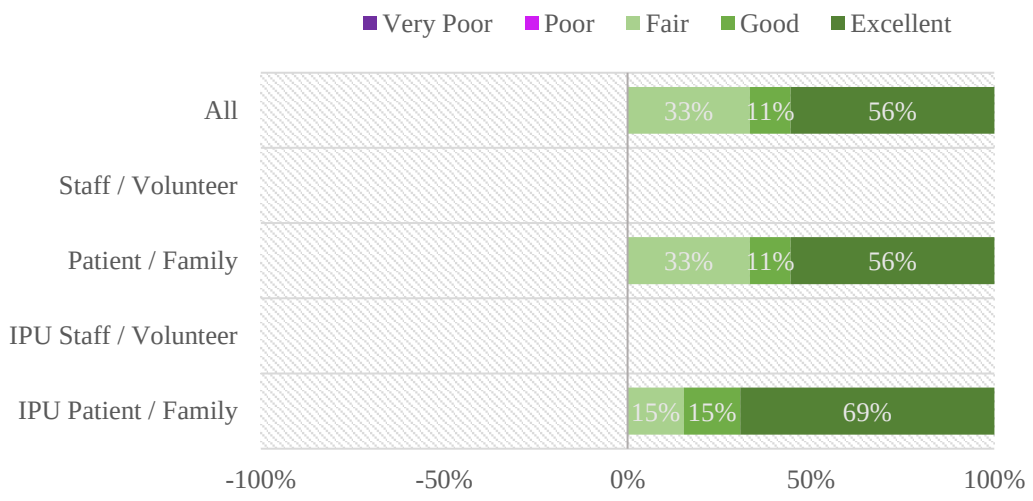
Respondents’ satisfaction with visibility of staff.



Patient / Family Users gave our 100% satisfaction rating for visibility of Staff / Volunteer Users, 59% of which was rated “Excellent”

IPU Patient / Family Users gave our 100% satisfaction rating for visibility of Staff / Volunteer Users, 69% of which was rated “Excellent”

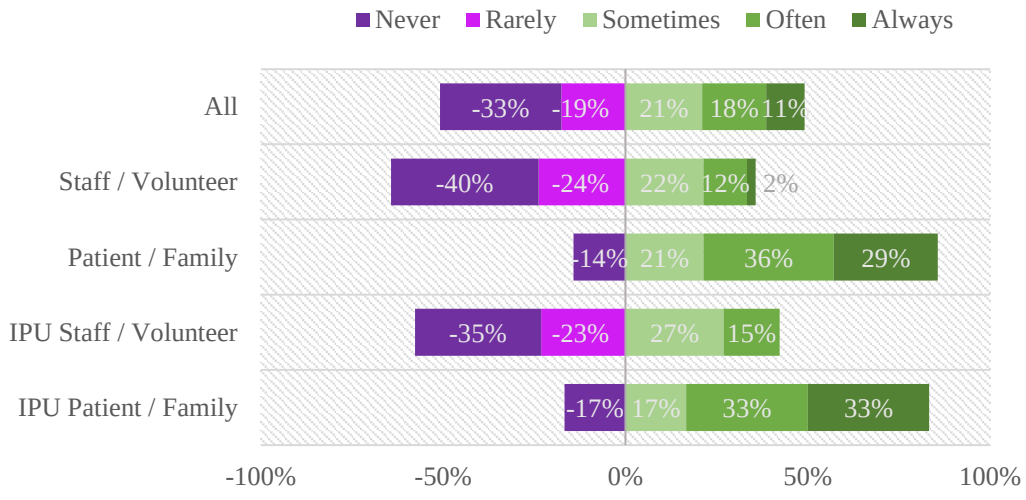
Respondents' satisfaction with availability of space for all visitors.



Patient / Family Users gave our 100% satisfaction rating for availability of space for all visitors, 56% of which was rated "Excellent"

Respondents' perceived level of control in the environment

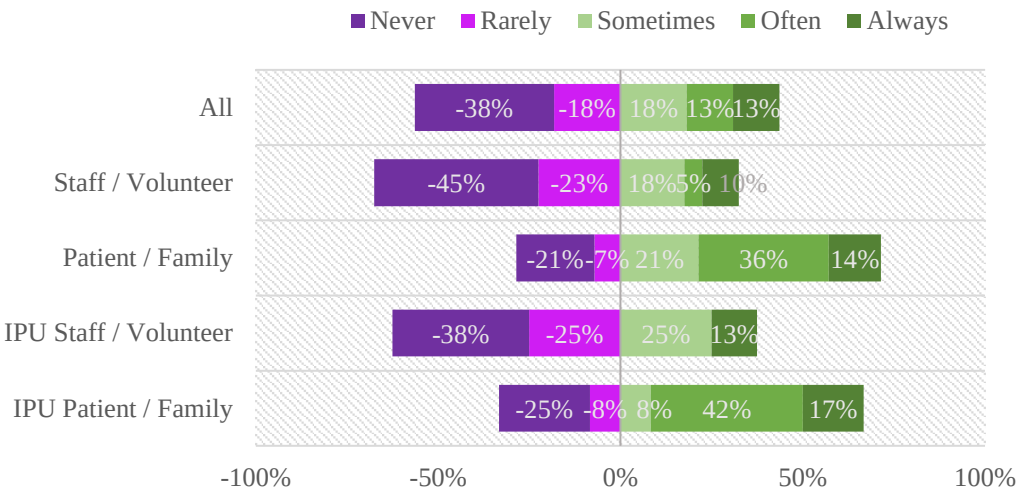
Respondents' satisfaction with perceived personal level of temperature control .



50% of all felt they good level of personal control of temperature, 33% rated that they never had control. Staff / Volunteer Users and Patient / Family Users giving a 36% and 86% rating of control, respectively.

42% and 83% of IPU Staff / Volunteer Users and IPU Patient / Family Users felt they good level of personal control of temperature, respectively.

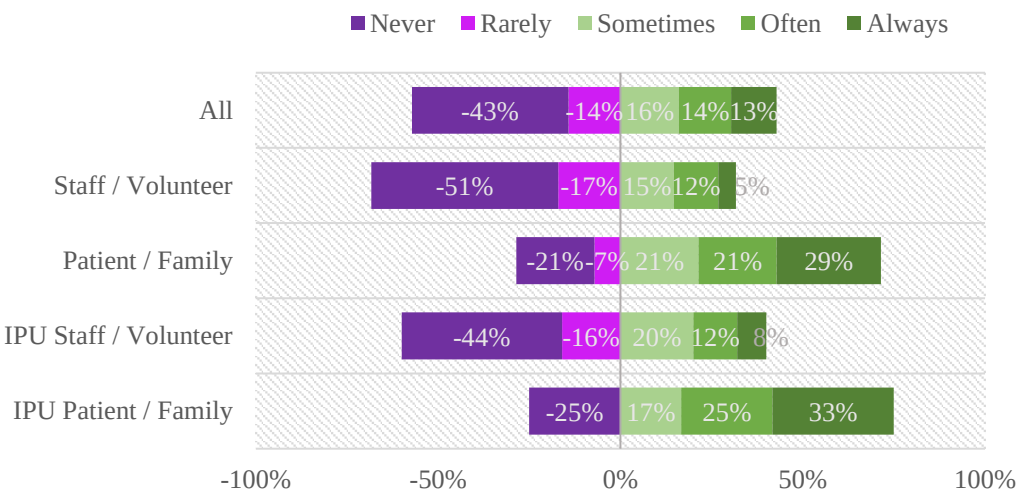
Respondents' satisfaction with perceived personal level of ventilation control



44% of all felt they good level of personal control of ventilation, 38% rated that they never had control. Staff / Volunteer Users and Patient / Family Users giving a 33% and 71% rating of control, respectively.

38% and 67% of IPU Staff / Volunteer Users and IPU Patient / Family Users felt they good level of personal control of ventilation, respectively.

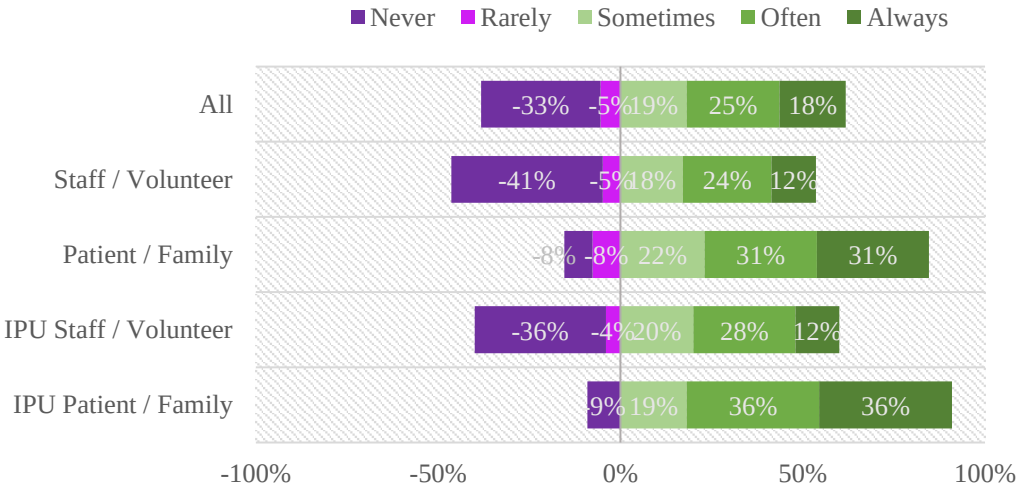
Respondents' satisfaction with perceived personal level of natural light control.



43% of all felt they good level of personal control of natural light, 43% rated that they never had control. Staff / Volunteer Users and Patient / Family Users giving a 32% and 71% rating of control, respectively.

40% and 75% of IPU Staff / Volunteer Users and IPU Patient / Family Users felt they good level of personal control of natural light, respectively.

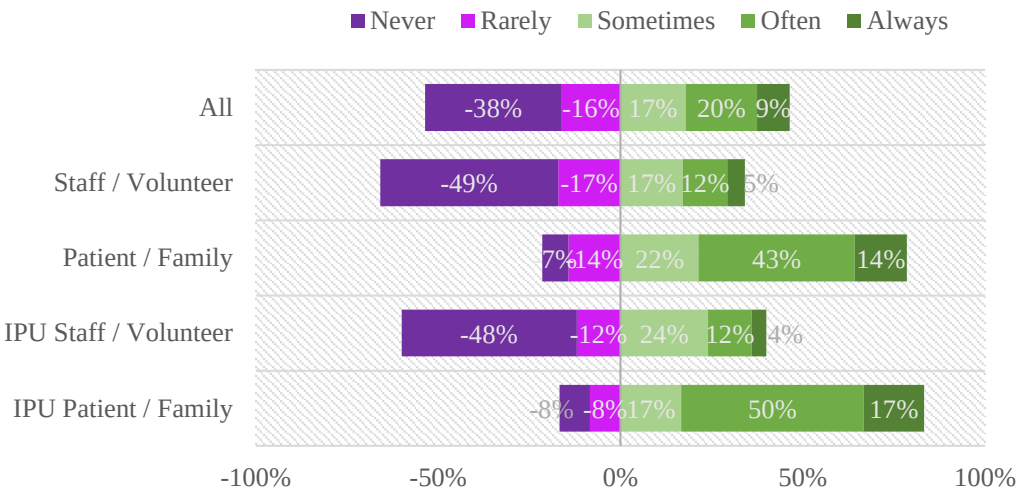
Respondents' satisfaction with perceived personal level of noise control



62% of all felt they good level of personal control of noise, 33% rated that they never had control. Staff / Volunteer Users and Patient / Family Users giving a 54% and 84% rating of control, respectively.

60% and 91% of IPU Staff / Volunteer Users and IPU Patient / Family Users felt they good level of personal control of noise, respectively.

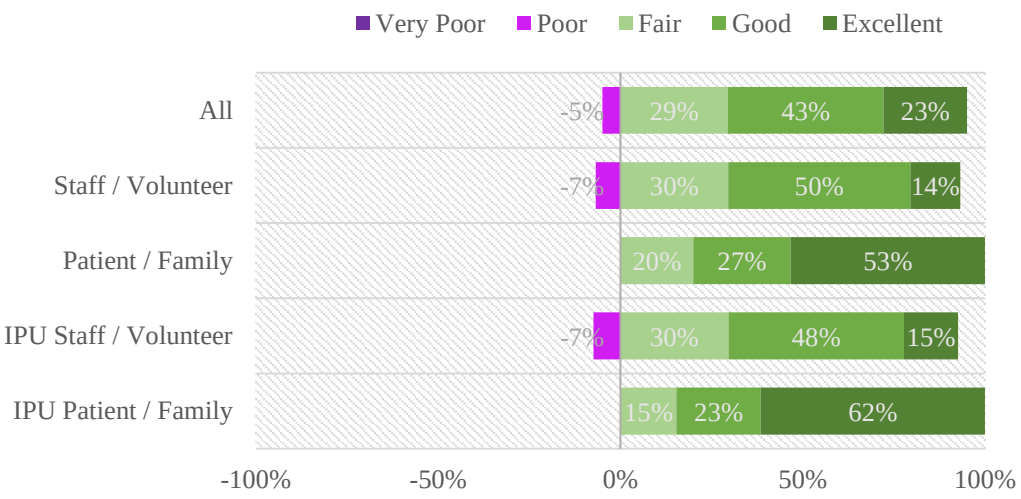
Respondents' satisfaction with perceived personal level of artificial light control.



46% of all felt they good level of personal control of artificial light, 30% rated that they never had control. Staff / Volunteer Users and Patient / Family Users giving a 34% and 77% rating of control, respectively.

40% and 84% of IPU Staff / Volunteer Users and IPU Patient / Family Users felt they good level of personal control of artificial light, respectively.

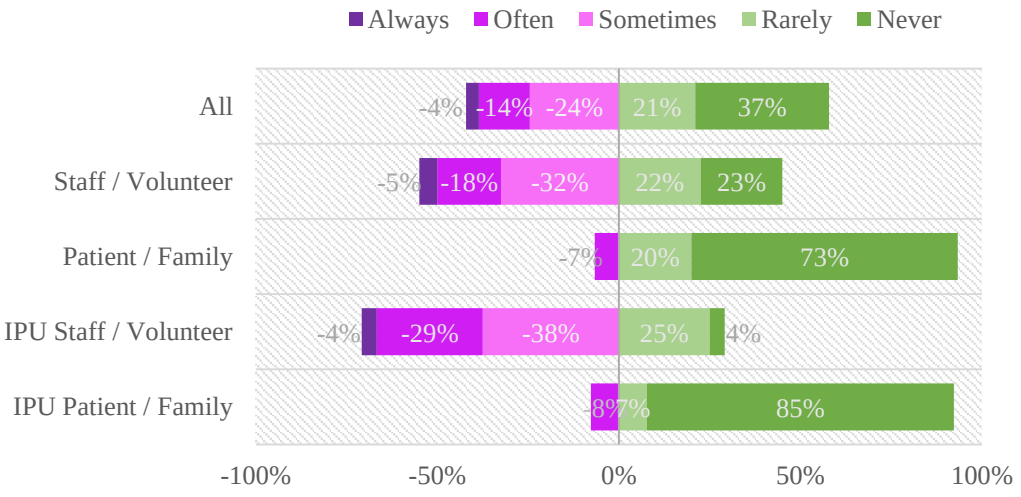
Respondents' satisfaction with suitability of the parking facilities.



all gave a 95% satisfaction rating for suitability of parking facilities. Staff / Volunteer Users and Patient / Family Users giving our 93% and 100% satisfaction rating, respectively.

IPU Staff / Volunteer Users and IPU Patient / Family Users gave our 93% and 100% satisfaction rating for suitability of parking facilities, respectively.

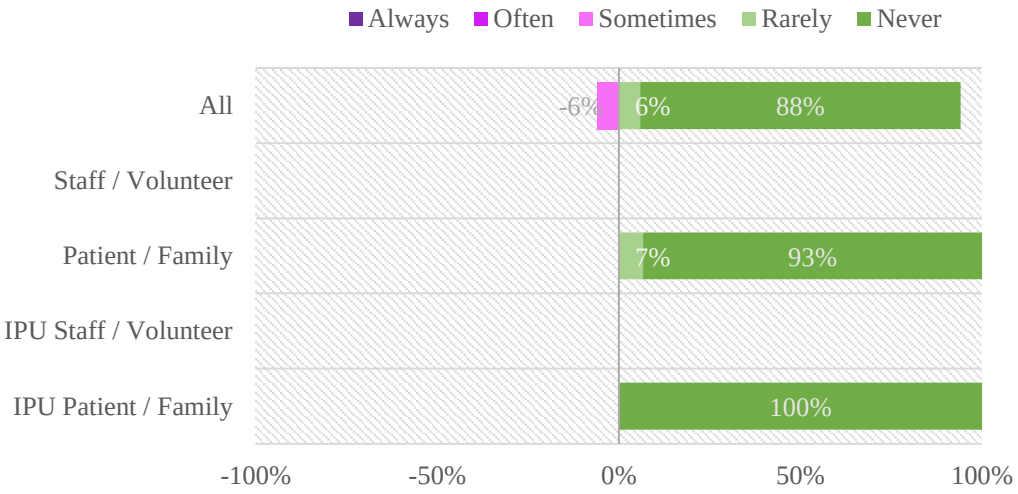
Respondents' frequency of being bothered by noise



58% of all felt they were rarely or never bothered by noise. Staff / Volunteer Users and Patient / Family Users feeling they were rarely or never bothered by noise 46% and 93%, respectively.

29% and 92% of IPU Staff / Volunteer Users and IPU Patient / Family Users felt they were rarely or never bothered by noise, respectively.

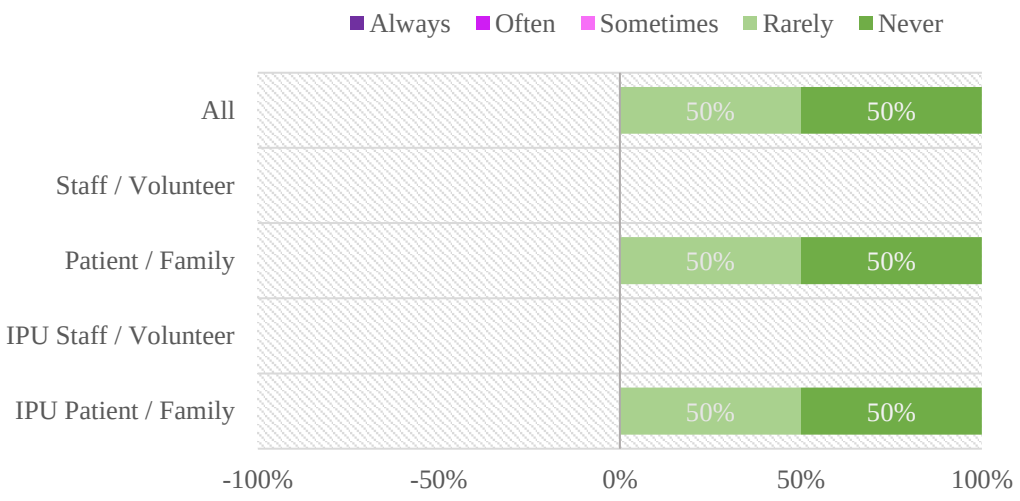
Respondents' frequency of having a hard time hearing or understanding staff because of noise (note: the all user response included those who didn't define their role).



100% of Patient / Family Users felt they rarely or never had a hard time hearing or understanding Staff / Volunteer Users due to the noise.

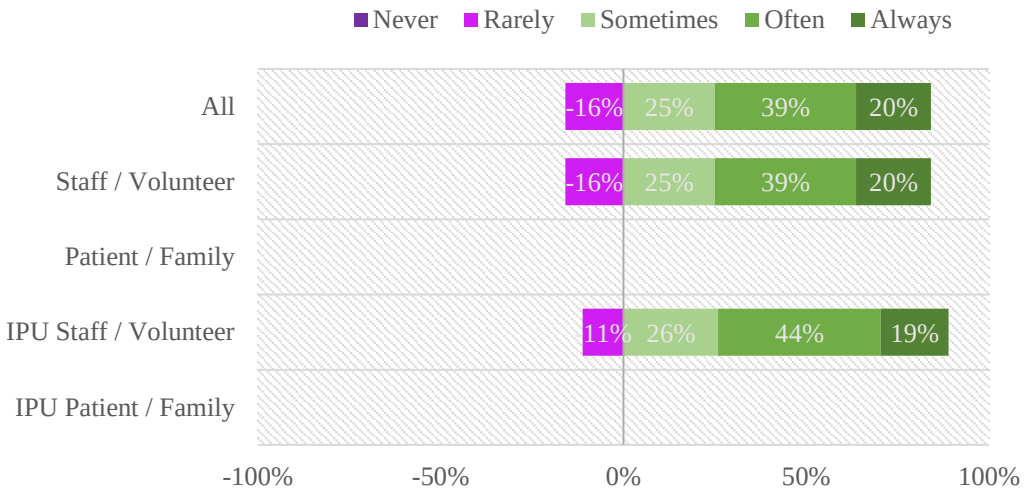
100% of IPU Patient / Family Users felt they rarely or never had a hard time hearing or understanding Staff / Volunteer Users due to the noise.

Respondents' frequency of being awakened at night by sounds, other than for required activities.



100% of IPU Patient / Family Users felt they were rarely or never awakened at night by sounds, other than for required activities.

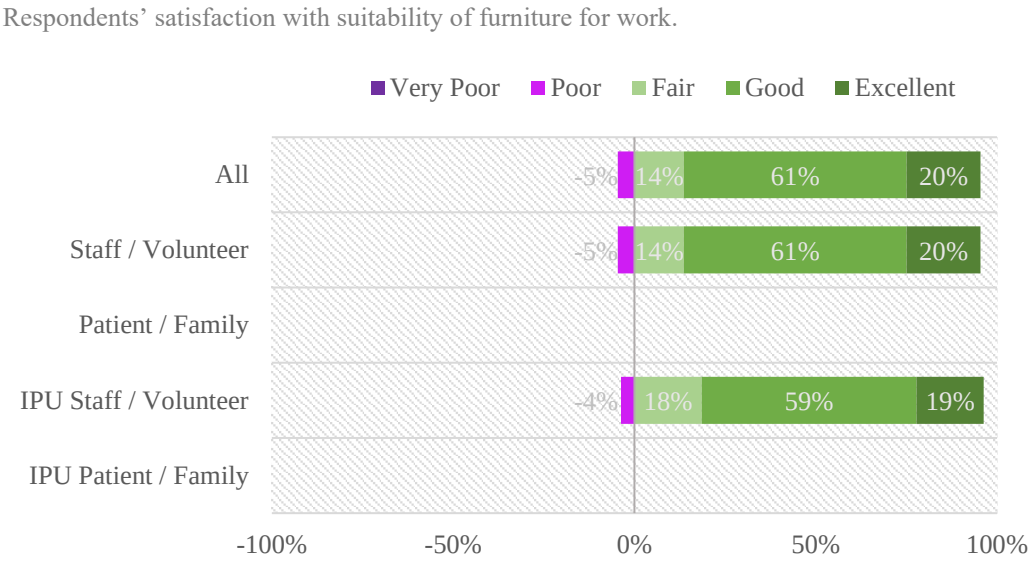
Respondents' frequency of being able to take a break without being on demand.



94% of Staff / Volunteer Users felt they could take a break without being on demand.

89% of IPU Staff / Volunteer Users felt they could take a break without being on demand.

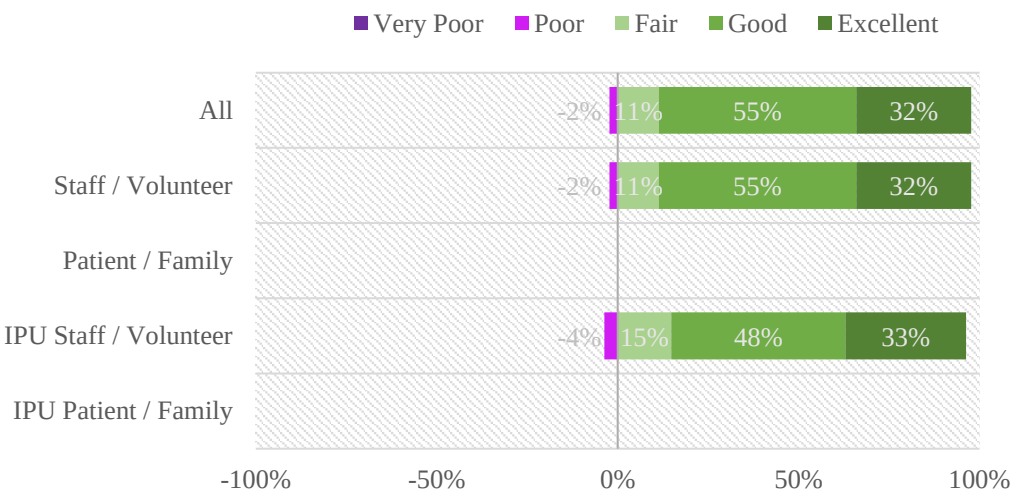
Staff satisfaction with work environment



Staff / Volunteer Users gave a 95% satisfaction rating for suitability of furniture for work.

IPU Staff / Volunteer Users gave a 96% satisfaction rating for suitability of furniture for work.

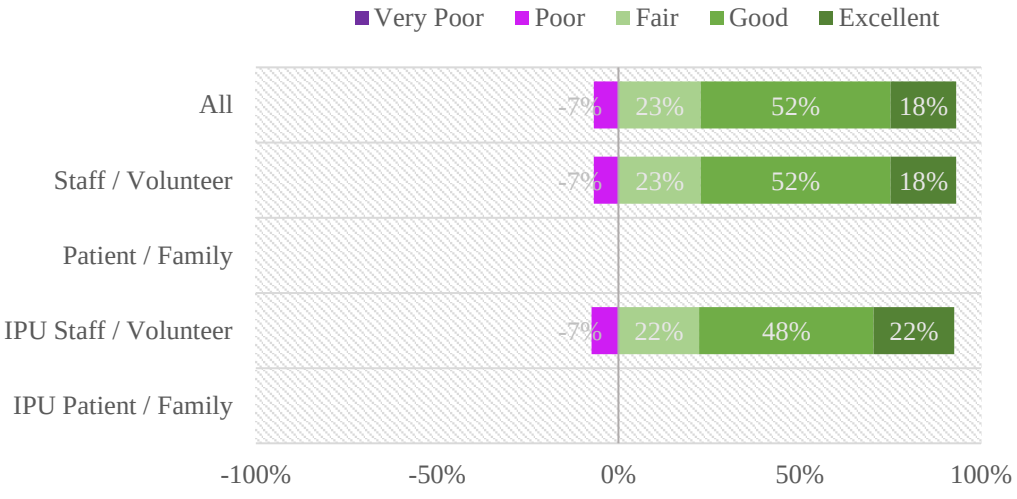
Respondents' satisfaction with layout facilitating a productive working environment.



Staff / Volunteer Users gave a 98% satisfaction rating for the layout facilitating a productive working environment.

IPU Staff / Volunteer Users gave a 96% satisfaction rating for the layout facilitating a productive working environment.

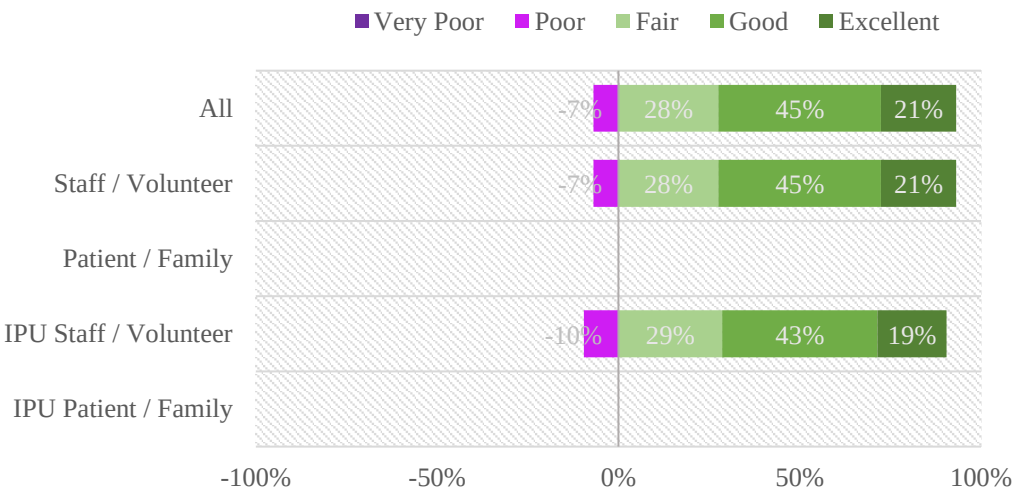
Respondents' satisfaction with visibility of patients, clients or visitors during the day.



Staff / Volunteer Users gave a 93% satisfaction rating for visibility of Patient / Family Users, clients or visitors during the day.

IPU Staff / Volunteer Users gave a 93% satisfaction rating for visibility of Patient / Family Users, clients or visitors during the day.

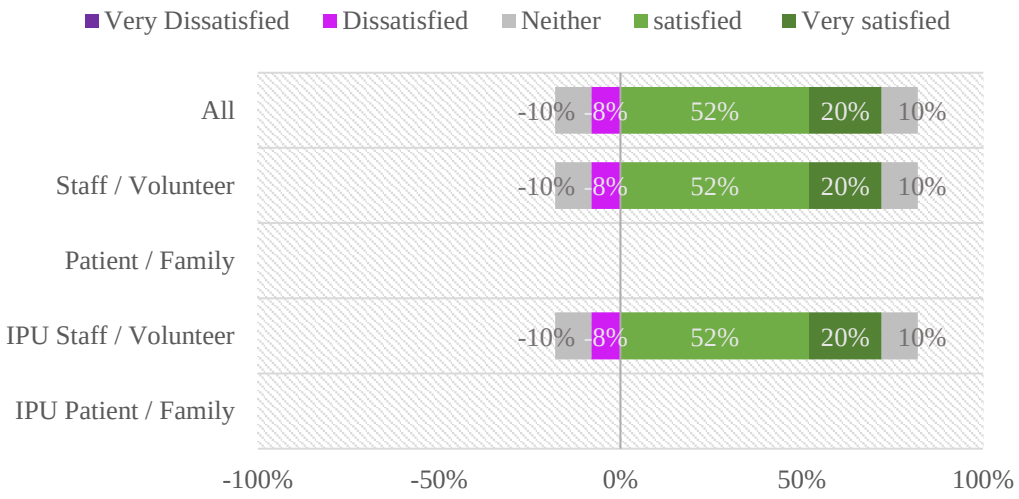
Respondents' satisfaction with visibility of patients, clients or visitors at night.



Staff / Volunteer Users gave a 93% satisfaction rating for visibility of Patient / Family Users, clients or visitors at night.

IPU Staff / Volunteer Users gave a 90% satisfaction rating for visibility of Patient / Family Users, clients or visitors at night.

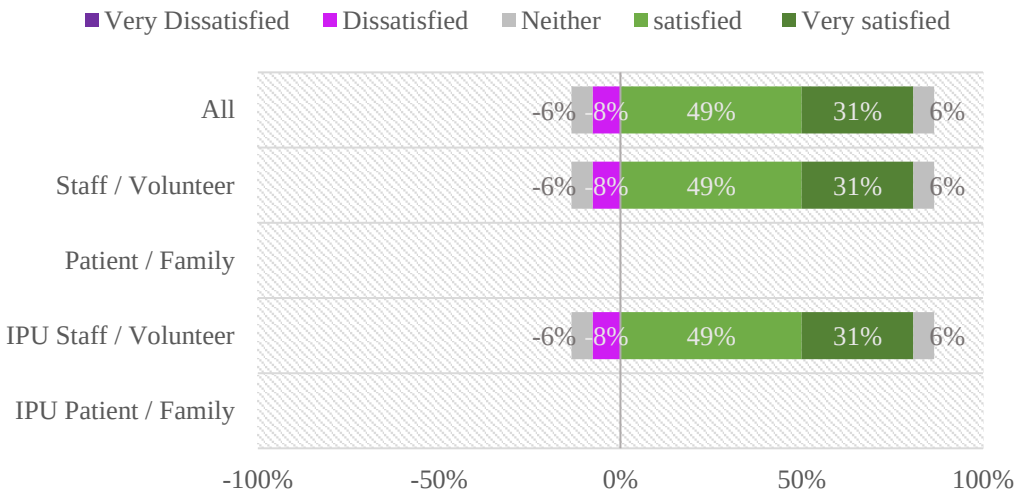
Respondents' satisfaction with patients being observable.



Staff / Volunteer Users gave a 90% satisfaction rating for Patient / Family Users being observable.

IPU Staff / Volunteer Users gave a 90% satisfaction rating for Patient / Family Users being observable.

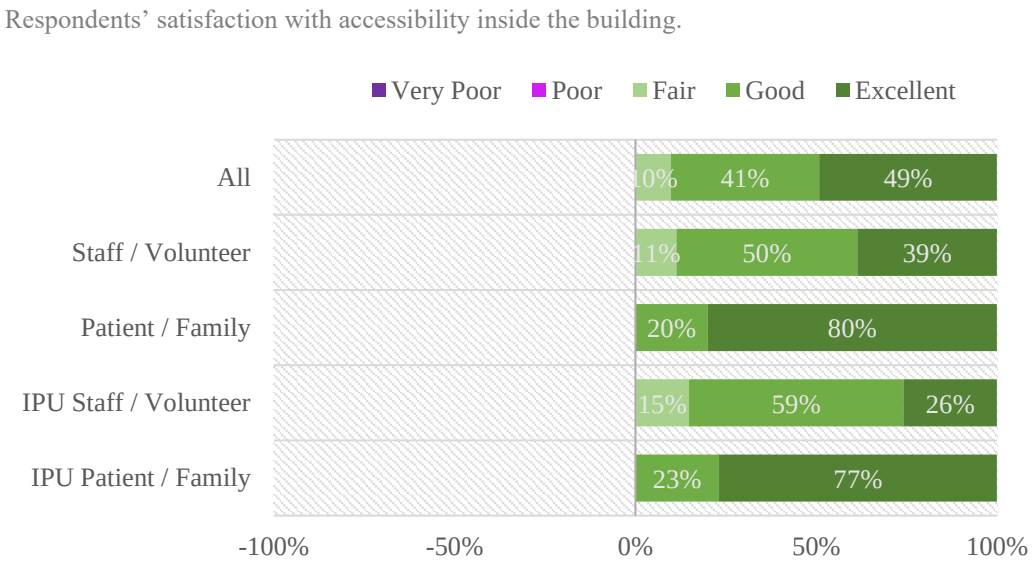
Respondents' satisfaction with IPU layout.



Staff / Volunteer Users gave a 94% satisfaction rating for IPU layout.

IPU Staff / Volunteer Users gave a 94% satisfaction rating for IPU layout.

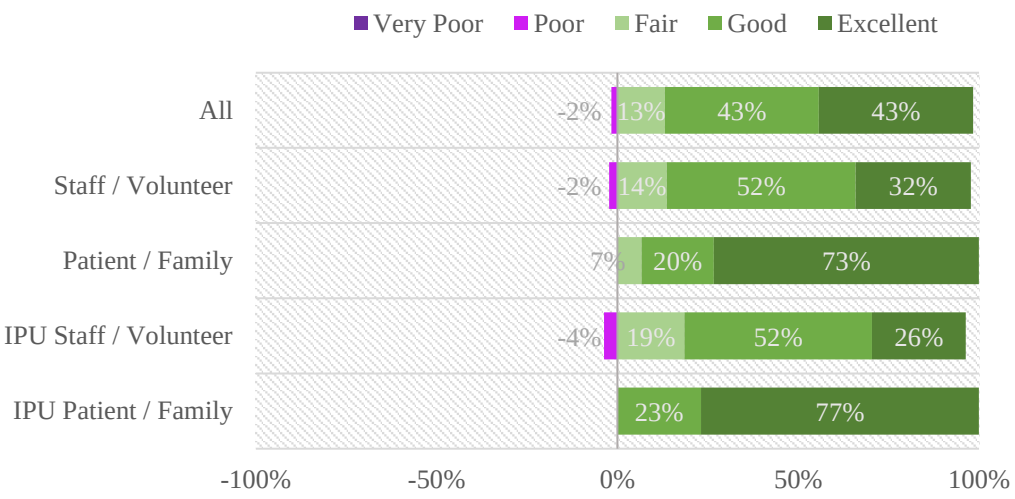
Respondents' satisfaction with areas supporting independence



All gave a 100% satisfaction rating for accessibility inside the building. Staff / Volunteer Users and Patient / Family Users giving a 100% and 100% rating, respectively.

IPU Staff / Volunteer Users and Patient / Family Users gave a 100% and 100% satisfaction rating for accessibility inside the building, respectively.

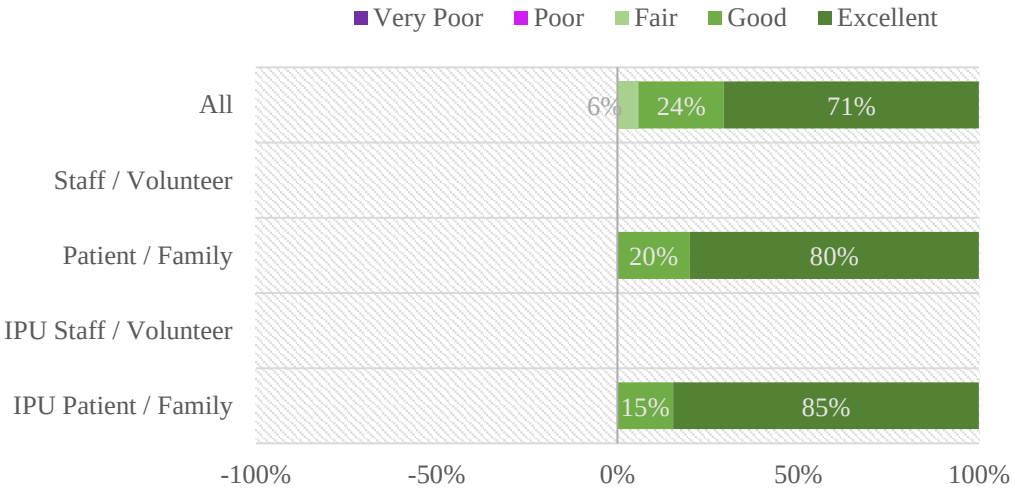
Respondents' satisfaction with building layout.



All gave a 90% satisfaction rating for building layout. Staff / Volunteer Users and Patient / Family Users giving a 90% and 100% rating, respectively.

IPU Staff / Volunteer Users and Patient / Family Users gave a 96% and 100% satisfaction rating for building layout, respectively.

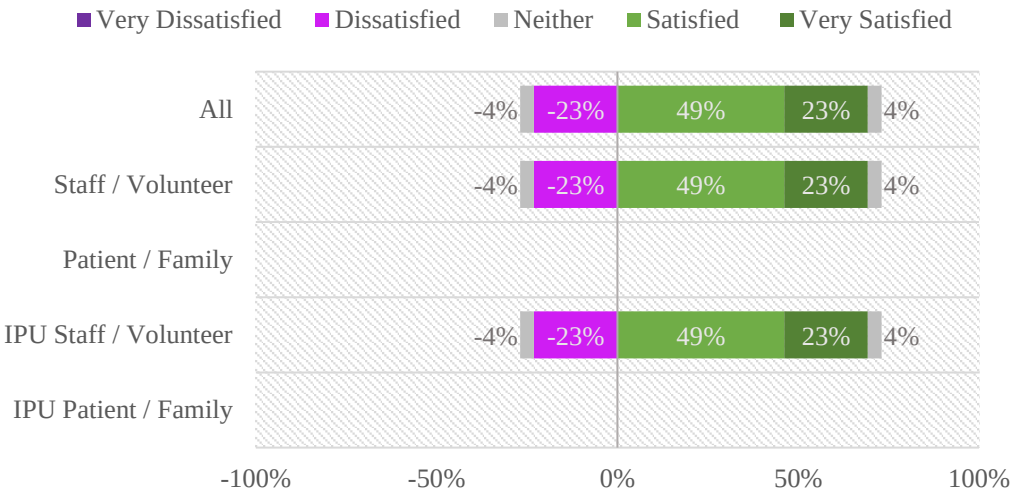
Respondents' satisfaction with building catering for their specific needs.



Patient / Family Users gave a 100% satisfaction rating for building catering for their specific needs, 73% of which was “Excellent”.

IPU Patient / Family Users gave a 100% satisfaction rating for building catering for their specific needs, 77% of which was “Excellent”

Respondents’ satisfaction with adaptability of the bed area in meeting the specific needs of patient’s.

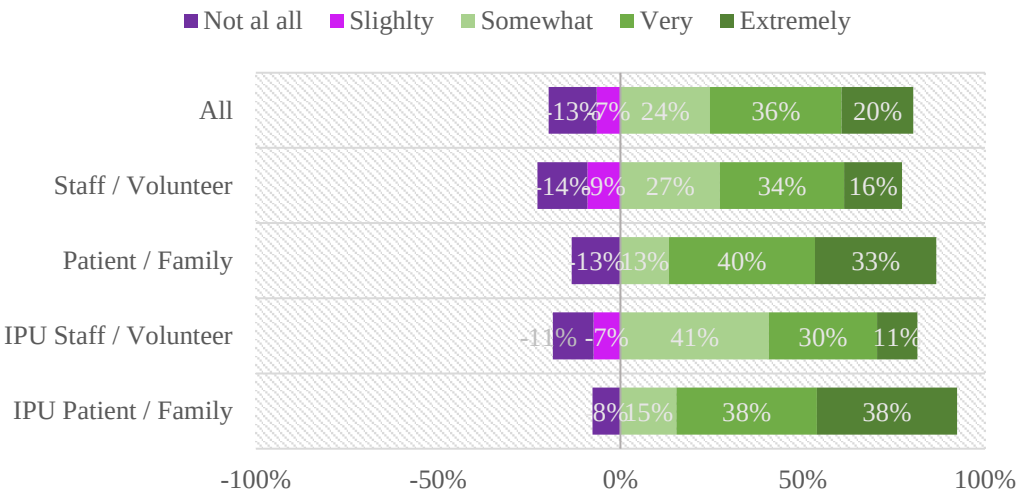


Staff / Volunteer Users gave a 72% satisfaction rating for adaptability of the bed area in meeting the specific needs of Patient / Family Users.

IPU Staff / Volunteer Users gave a 72% satisfaction rating for adaptability of the bed area in meeting the specific needs of Patient / Family Users.

Respondents’ perceived view on factors influencing sense of home

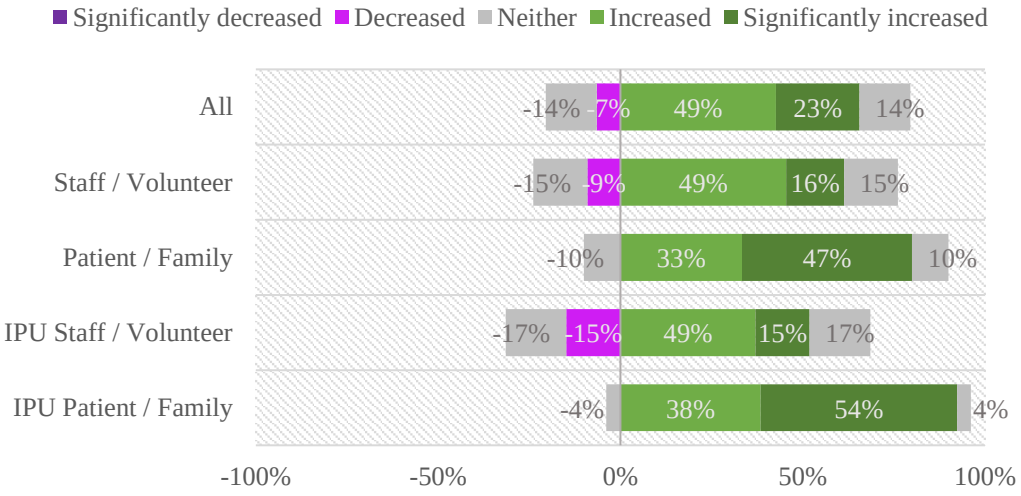
Respondents' perceived view on if the building impacts upon their wellbeing.



80% of all felt the building had an impact on their well-being. Staff / Volunteer Users and Patient / Family Users giving this a 77% and 87% rating, respectively.

82% and 92% of IPU Staff / Volunteer Users and IPU Patient / Family Users felt the building had an impact on their well-being, respectively.

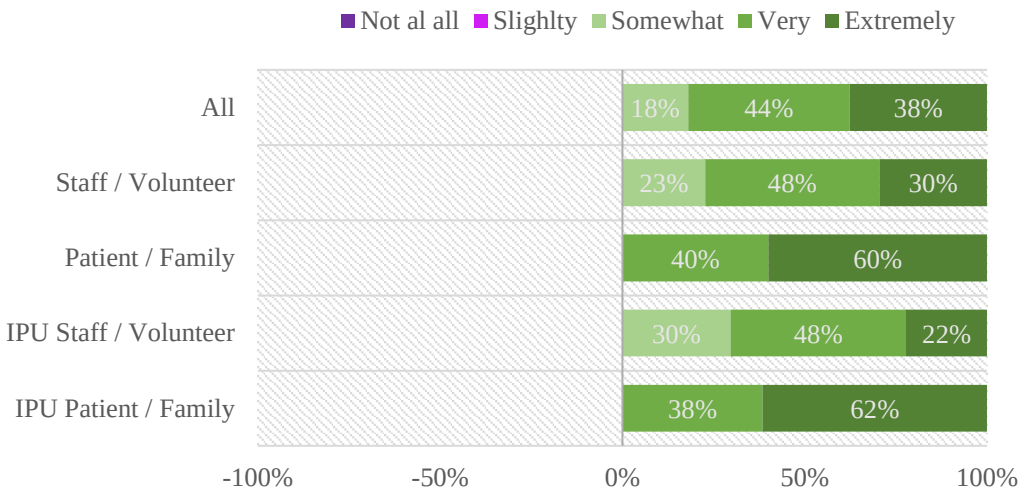
Respondents' perceived view on how the building impacts upon their wellbeing.



72% of all felt the building environment improved their wellbeing. Staff / Volunteer Users and Patient / Family Users giving this a 65% and 80% rating, respectively.

64% and 92% of IPU Staff / Volunteer Users and IPU Patient / Family Users felt the building environment improve their wellbeing, respectively.

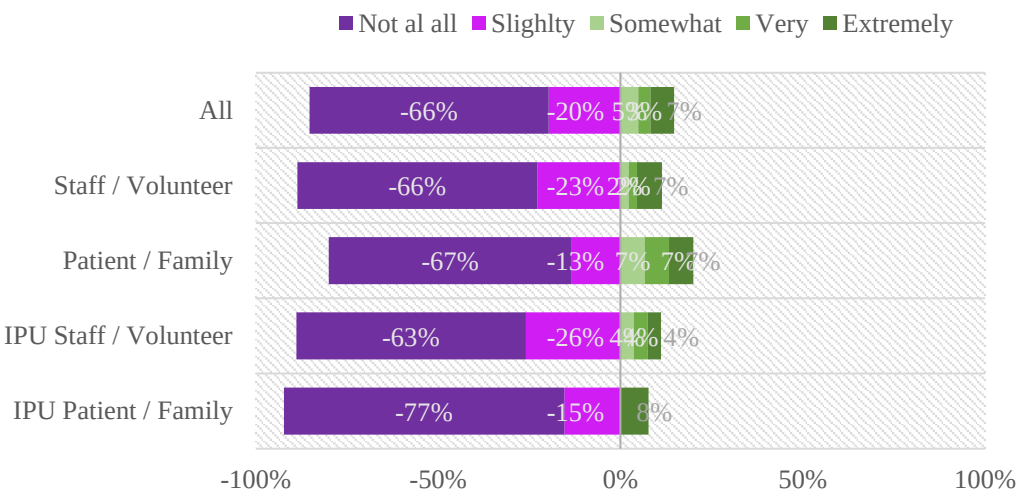
Respondents' perceived view on how comfortable they are within the building.



100% of all felt comfortable in the building. Staff / Volunteer Users and Patient / Family Users giving this a 100% and 100% rating, respectively.

100% and 100% of IPU Staff / Volunteer Users and IPU Patient / Family Users felt comfortable in the building, respectively.

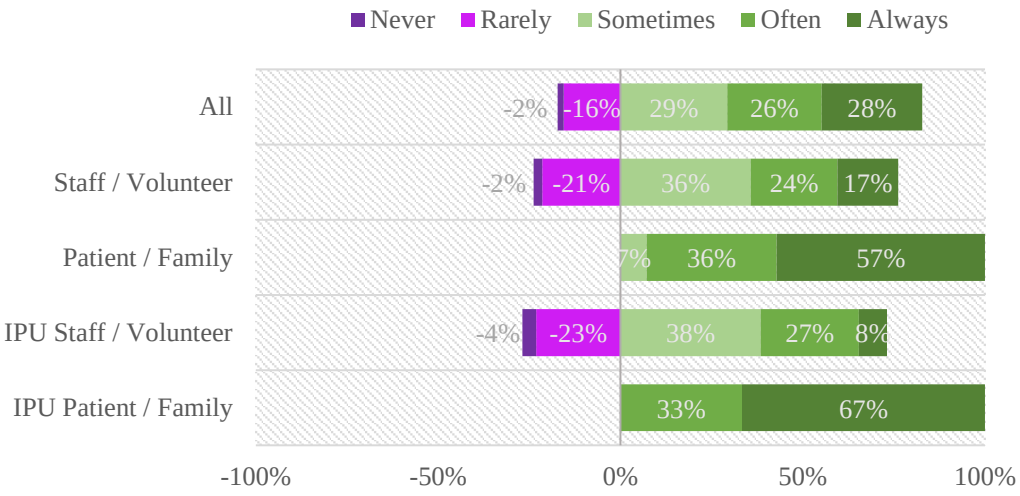
Respondents' perceived view on how clinical the building looks.



86% of all felt the building didn't look clinical. Staff / Volunteer Users and Patient / Family Users giving this an 89% and 80% rating, respectively.

89% and 92% of IPU Staff / Volunteer Users and IPU Patient / Family Users felt the building didn't look clinical, respectively.

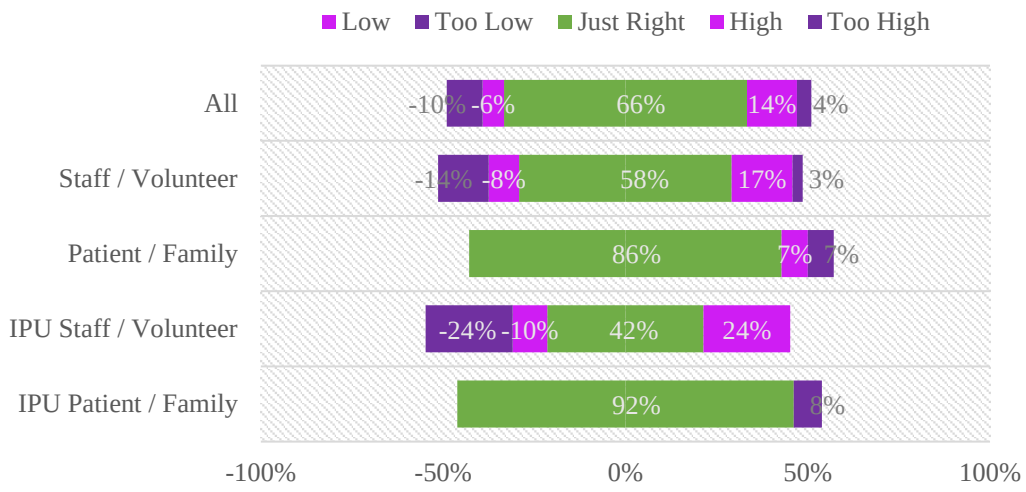
Respondents' perceived view on having time alone, when required.



82% of all felt they have time alone, when required. Staff / Volunteer Users and Patient / Family Users giving this a 77% and 100% rating, respectively.

73% and 100% of IPU Staff / Volunteer Users and IPU Patient / Family Users felt they have time alone, when required, respectively.

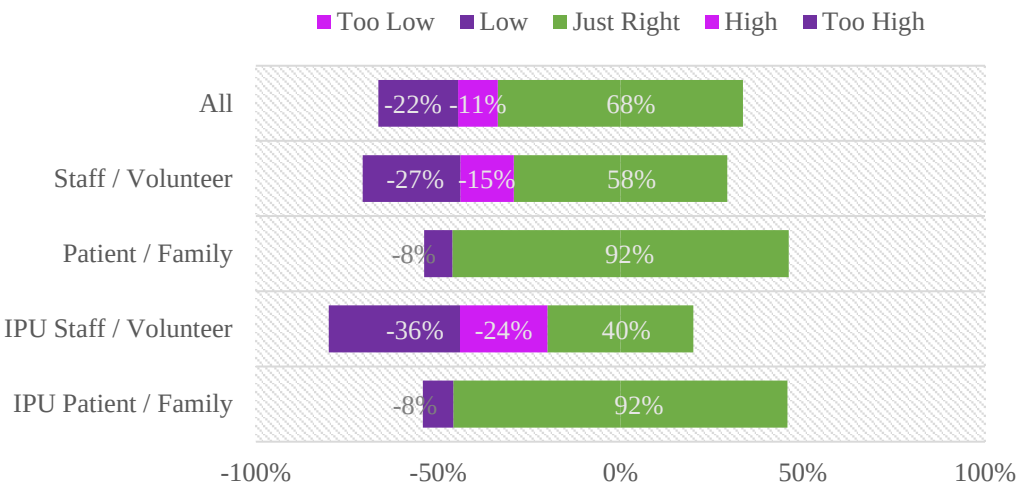
Respondents' satisfaction with temperature level.



66% of all felt that temperature level was "just right". Staff / Volunteer Users and Patient / Family Users giving this a 58% and 86% rating, respectively.

42% and 89% of IPU Staff / Volunteer Users and IPU Patient / Family Users felt that temperature level was "just right", respectively.

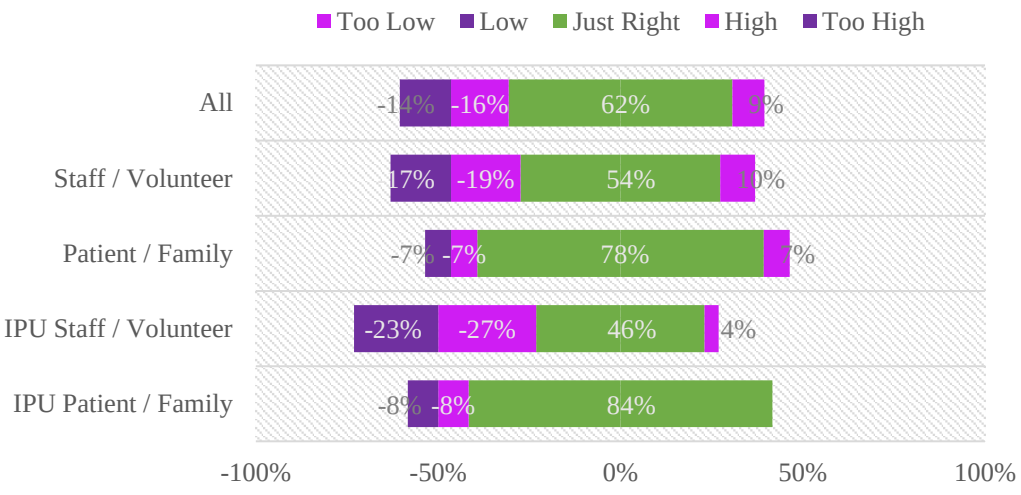
Respondents' satisfaction with ventilation level.



68% of all felt that ventilation level was "just right". Staff / Volunteer Users and Patient / Family Users giving this a 58% and 92% rating, respectively.

40% and 92% of IPU Staff / Volunteer Users and IPU Patient / Family Users felt that ventilation level was "just right", respectively.

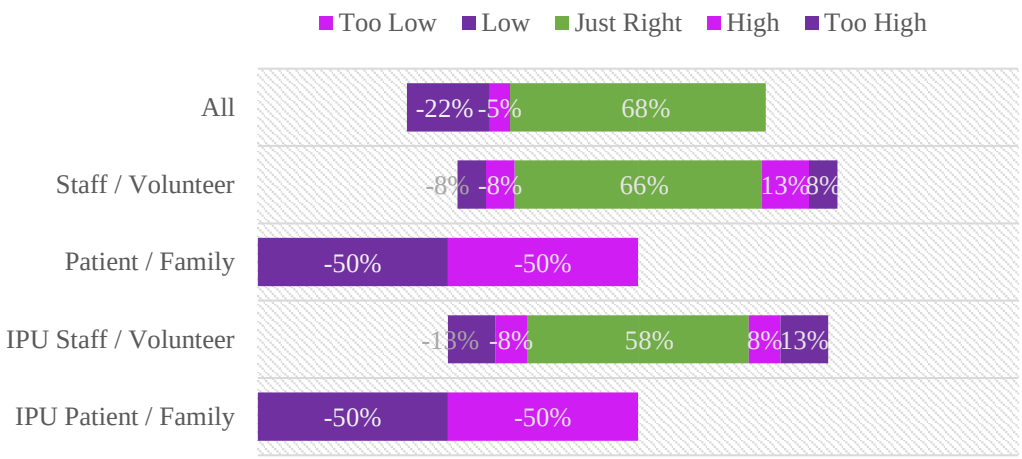
Respondents' satisfaction with natural light level.



62% of all felt that natural light level was “just right”. Staff / Volunteer Users and Patient / Family Users giving this a 54% and 78% rating, respectively.

46% and 84% of IPU Staff / Volunteer Users and IPU Patient / Family Users felt that natural light level was “just right”, respectively.

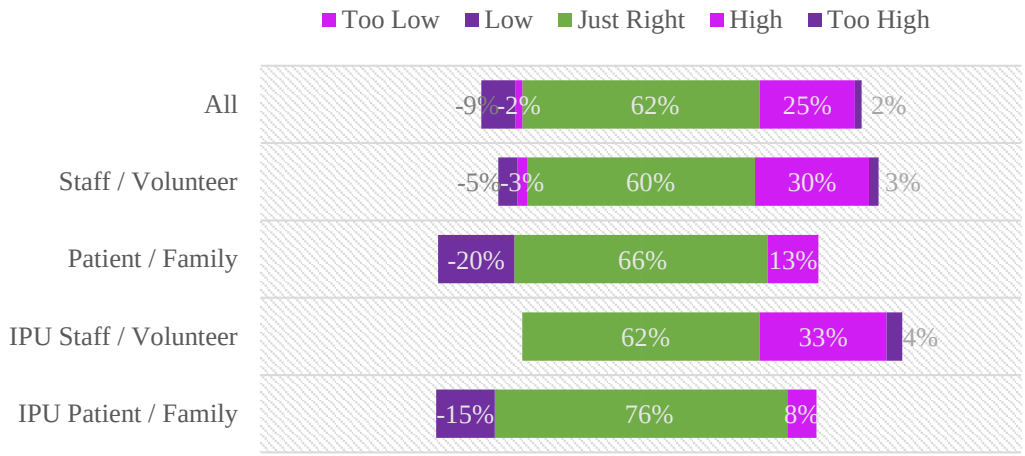
Respondents’ satisfaction with artificial light.



68% of all felt that artificial light level was “just right”. Staff / Volunteer Users and Patient / Family Users giving this a 66% and 0% rating, respectively.

58% and 0% of IPU Staff / Volunteer Users and IPU Patient / Family Users felt that artificial light level was “just right”, respectively.

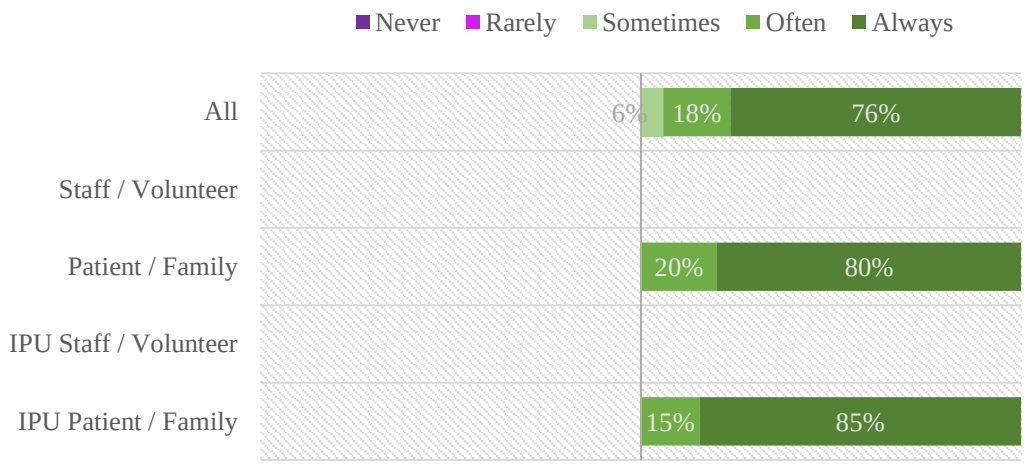
Respondents' satisfaction with noise level.



62% of all felt that noise level was "just right". Staff / Volunteer Users and Patient / Family Users giving this a 60% and 66% rating, respectively.

62% and 76% of IPU Staff / Volunteer Users and IPU Patient / Family Users felt that noise level was "just right", respectively.

Respondents' satisfaction with suitability of space for privacy.

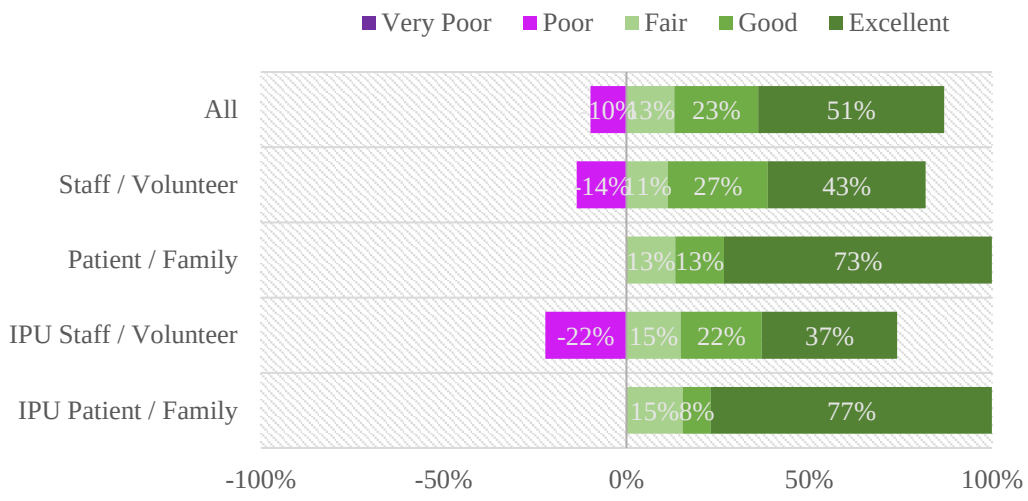


100% of IPU Patient / Family Users felt they had suitability of space for privacy.

100% of IPU Patient / Family Users felt they had suitability of space for privacy.

Respondents' satisfaction with positive distractions

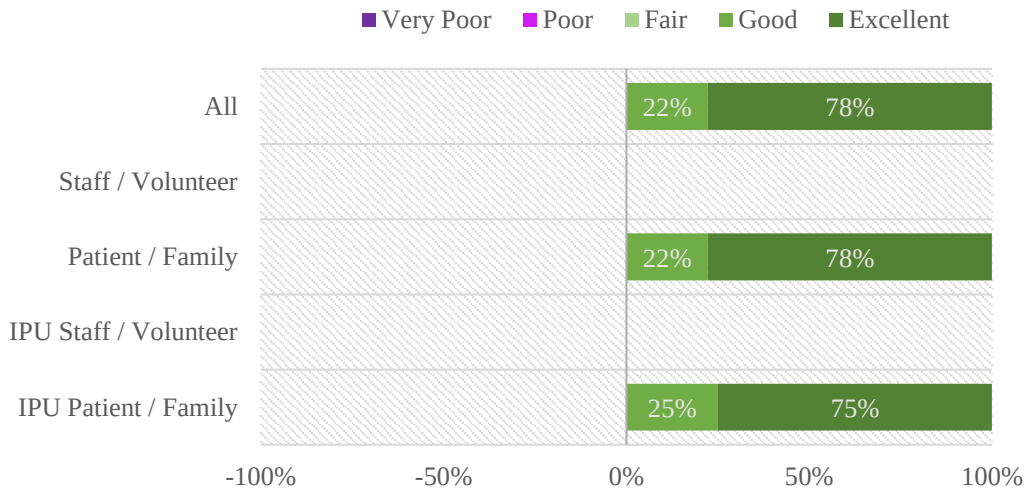
Respondents' satisfaction with access to a window with views of the outside.



All gave a 90% satisfaction rating for access to a window with views of the outside. Staff / Volunteer Users and Patient / Family Users giving an 86% and 100% rating, respectively.

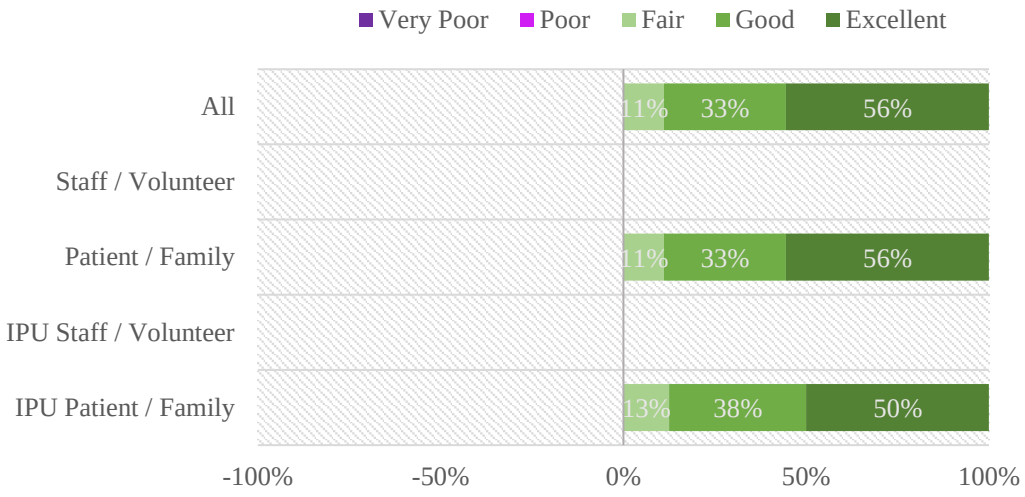
IPU Staff / Volunteer Users and Patient / Family Users gave a 70% and 100% satisfaction rating for access to a window with views of the outside, respectively.

Respondents' satisfaction with how therapeutic the bedroom is.



IPU Patient / Family Users gave a 100% satisfaction rating for how therapeutic the bedroom is, 75% of which was rated “Excellent”.

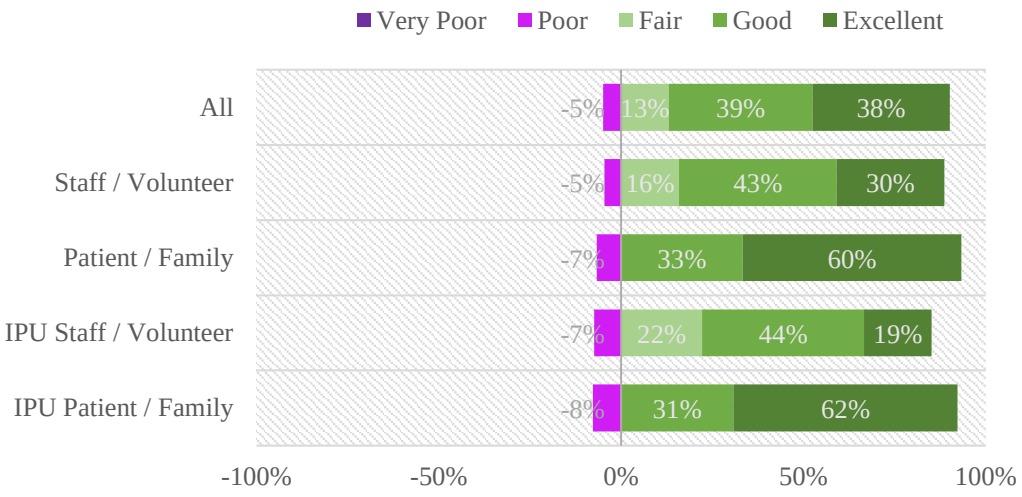
Respondents’ satisfaction with views of nature out the window from their bed.



IPU Staff / Volunteer Users and Patient / Family Users gave a 100% satisfaction rating for views of nature out the window from their bed, 50% of which was rated “Excellent”.

Respondents’ satisfaction with outdoor space

Respondents’ satisfaction with access to an outside space.



All gave a 95% satisfaction rating for access to an outside space. Staff / Volunteer Users and Patient / Family Users giving a 95% and 93 version rating, respectively.

IPU Staff / Volunteer Users and Patient / Family Users gave a 93% and 92% satisfaction rating for access to an outside space, respectively.