

*Healing Environment:
A Contribution to the Interior Design and Décor Features in Single Occupancy
Hospital Rooms in Libya*

A Dissertation
In
Healthcare Environmental Design

by
Moamer M. Gashoot

Submitted to the School of Health and Social Care
Bournemouth University in Partial Fulfilment
of the Requirements for the Degree of
Doctor of Philosophy
(PhD)

2012

Declaration

I hereby declare that this thesis has not been and will not be submitted in whole or in part to another University for the award of any other degree. This copy of the thesis has been supplied on condition that anyone who consults it is understood to recognise that its copyright rests with its author and due acknowledgement must always be made of the use of any material contained in, or derived from, this thesis.

Signature:

Moamer Gashoot

Dedication

This research study dedicated to my Mother, Mrs Fatema Al- Sugi and my Father Mohamed Gashoot who passed away in the year 1999 and 2000,their purified spirits, Respectively.

Acknowledgements

This project is part of my life's work of which I am proud. It is work I have done in pursuit of my living goals of knowing more and being more. However despite all my drive and desires, I want to acknowledge a few people.

I would like to thank my supervisory team, Dr. Francis Biley, Dr. Carol Bond and Dr. Chris Little for their support, advice, patience and guidelines along the way. I could not have found a better supervisory team.

I would like to thank Dr. Francis Biley for supporting me during the Libyan war and guiding me in what to do to help my sisters in Tripoli, and for his valuable advice during the eight months of war in Libya.

I would like to thank Dr. Carol Bond for her valuable comments on my work and for the vital advice on the methodology.

I would like to thank Dr. Chris Little for her comments on my transfer report and ethical proposal.

I would like to dedicate this work to my Mother, Mrs Fatema Al- Sugi and my Father, Mohamed Gashoot who passed away in the year 1999 and 2000, respectively. I know my sisters would appreciate your vital support more if you were still alive.

I am very grateful for the meaningful advice from my advisors and recommendations in addressing the numerous challenges I have faced during the research.

I would like to extend my appreciation to the school administrators Sara and Eva who also provided advice on many aspects of my study.

I would like to thank the almighty GOD for giving me the strength I needed to achieve my dreams. Through prayer anything is possible.

Achieving my goals would not have been possible without the support of my sisters, and my brother. I was so many miles away but they never made me feel guilty about not being with them and I am grateful for their encouragement to work hard. I also received a lot of support from friends and relatives whom I will not mention by name. Their effort and support is forever cherished.

Thank you

Abstract

Purpose: This research was aimed at creating an awareness of the importance of hospital room design, which would lead to a convergence of designer and décor skill with general public requirements. This research will also adapt the Mehrabian-Russell model frameworks to the environmental behaviour- user relationships in healthcare design, a process which was further developed by Bitner. It will test predictions from this model in order to fill knowledge gaps and improve hospital room design.

The major purpose of design and décor is to meet customer requirements and also to demonstrate designer skill. Design and décor in a healthcare setting should primarily be aimed at pleasing hospital room users. Addressing a hospital room user's needs to his or her satisfaction with healthcare facilities is only possible if these requirements are clearly documented and known. General public design and décor preferences are not clearly documented in healthcare settings, therefore design and décor professionals use their intuition to project these requirements.

Introduction: Many researchers have outlined their views with regards to healthcare environments and this document critically analyses some of the work. Despite the importance of design and décor to the public well-being, it is the researcher's considered view that hospital room design and décor is currently an expression of self by designers and not a reflection of people's requirements.

Methods: This study was conducted in Libya, where the researcher was engaged with participants in discussing their preferences regarding preferred single occupancy design through an inductive and interpretive approach. The interpretive research approach, which is associated with the philosophy of meaningful interaction between the research, and the researched, was utilized in this study. The approach involves making use of CAD (Computer Aided Design) software, which helps respondents to accurately map their preferences, in order to arrive at an understanding and interpretation of how people create and maintain their social worlds.

The researcher posted notices with the inclusion criteria on the notice boards around Tripoli University and the Medical Centre in Libya requesting participants to volunteer

to participate in the research. The selected participants who met the inclusion criteria participated in consultation sessions. During these, the researcher made use of CAD software to help respondents to accurately map their preferences. CAD software helps the general public to visualise how the hospital room will look and feel based on 3D computer images.

Results: All participants were over the age of 18 years and none of them was still under treatment or admitted to the hospital in Libya. These participants included students, university staff, and one security guard who works for Tripoli hospital. The data was analysed using a content analysis and other methods. A thematic analysis process was conducted. The findings of this study reveal that four major domains are involved in determining the participant's preferred hospital room design. The four major domains are environmental aesthetics, personalization, technology and mobility/flexibility.

The researcher's own developed framework is discussed based on the research findings of single occupancy research which fills the knowledge gap in Bitner's theoretical framework. It is structured according to the researcher's own developed framework which addresses environmental behaviour- user relationships in healthcare design. The discussion addresses the interior conditions and the technology conditions which are considered to supply new knowledge and which fill the gap in Bitner's theoretical framework.

Conclusion: A set of recommendations was constructed, based on new developed research theory and findings, which can guide healthcare designers in creating single occupancy room designs. The guidelines consist of both written recommendations and visual images of single occupancy interior design.

The following basic design principles were incorporated into this study recommendation: proportion, scale, harmony, rhythm, variety, contrast, and balance. A three –dimensional design and animation movie of single occupancy was created, guided by the finding of this research. Participants' preferences are incorporated along with the findings into a set of recommendations for the interior designer to use for the future design of hospital rooms.

Table of Contents

<i>Acknowledgements</i>	<i>iv</i>
<i>Abstract</i>	<i>v</i>
<i>List of Tables</i>	<i>xiv</i>
<i>List of Figures</i>	<i>xv</i>
<i>Chapter 1: Introduction and General Information</i>	<i>1</i>
1.1 Introduction	1
1.2 Background of the Research	1
1.2.1 Researcher's Perspective Informing This Research	1
1.2.2 Context	2
1.2.3 Industry Background	3
1.2.4 Proposed Knowledge Contribution of Study	4
1.2.5 Built Environment and Design Research.....	4
1.3 Theoretical Frameworks: Environmental Behaviours	5
1.3.1 Environmental Behaviour Approach	6
1.3.2 Human Behaviours	7
1.3.3 Internal Responses to the Physical Setting	11
1.3.4 Dimensions of the Interior Environment	13
1.3.5 Human Behaviour within Physical Setting.....	13
1.3.6 Sociological Human Need	14
1.4 Research Question and Objectives	15
1.4.1 Research Question	15
1.4.2 Objectives of the Research	16
1.4.3 Rationale for this Study	16
1.5 Type of Research.....	18
1.5.1 Qualitative / Quantitative Approach.....	18
1.5.2 Deductive / Inductive Approach.....	18

1.6	List of Definitions of Terms.....	19
1.7	Structure of the Present Dissertation.....	20
1.7.1	An Overview of Thesis Chapters.....	20
1.7.2	An Overview of the Visual Package.....	24
1.8	Summary of the Introduction	24
Chapter 2: Literature Review		25
2.1	Introduction	25
2.2	Search Strategy.....	26
2.2.1	Limitation of this Study.....	26
2.2.2	Literature Search	26
2.2.3	Inclusion/Exclusion Criteria.....	27
2.2.4	Categories	27
2.2.5	Theoretical Framework	28
2.3	Healthcare Design	29
2.3.1	An Overview of Healthcare Design Research.....	29
2.3.2	Healing Environment.....	30
2.3.3	Environmental Behaviour Theory	34
2.3.4	Environment Dimensions	34
2.3.5	The Physical Environment and Human Behaviour	35
2.4	Interior Conditions of the Physical Environment.....	40
2.4.1	Environmental Aesthetics.....	40
2.4.2	Light in Healthcare Environment	42
2.4.3	Art in Healthcare Environment.....	44
2.4.4	Colour in the Healthcare Environment.....	45
2.4.5	View of Nature	50
2.4.6	Advantages of Single Occupancy and Human Behaviour.....	50
2.4.7	Human Need in Single Occupancy.....	51
2.4.8	Creating Supportive Single Occupancy.....	52
2.5	Design Factors.....	53

2.5.1 Interior Design.....	53
2.5.2 The difficulty of Designing Interior Space.....	54
2.5.3 Interior Design Effects on Occupier.....	55
2.5.4 The Concept of Interior Design.....	57
2.6 Human Factors	58
2.6.1 Definition of an Appealing Interior Setting.....	58
2.6.2 Sensing of the Interior Environment	58
2.6.3 Human Comfort and Interior Design.....	59
2.7 Summary of the Literature Reviewed	60
Chapter 3: Materials and Methods.....	63
3.1 Introduction	63
3.2 Research Philosophy	64
3.2.1 Positivism Research.....	64
3.2.2 Critical Research	65
3.2.3 Interpretive Research.....	66
3.3 Research Approach	67
3.3.1 Subjective/Objective.....	67
3.3.2 Interview vs. Consultation.....	67
3.3.3 Method of Choice-Thematic Analysis.....	68
3.3.4 Thematic Analysis	68
3.4 Research Strategies	70
3.4.1 Summary of Research Strategies.....	70
3.4.2 The Recruitment Phase.....	70
3.4.3 Selection of Research Sample	72
3.4.4 Data Collection Phase- Consultation and ArchiCAD.....	72
3.4.5 Participant Collaboration.....	73
3.4.6 The Process of Creating Designs during the Data Collection	74
3.4.7 Steps in Preparing for the Consultation and Design Activities	76
3.5 Data Analysis	82

3.5.1 Thematic Analysis	82
3.6 Enhancing Research Rigour	85
3.6.1 Establishing Trustworthiness.....	86
3.7 Ethical Consideration and Ethical Approval.....	87
3.7.1 Planning Phase.....	87
3.7.2 Recruitment Phase	87
3.7.3 Data Collection Phase.....	88
3.7.4 Ethical Approval.....	89
3.8 Summary of Materials and Methods	90
Chapter 4: Research Findings.....	92
4.1 Introduction	92
4.2 The Thematic Analysis Finding	93
4.3 Emergent Themes 1: Environmental Aesthetics	96
4.3.1 Emergent Themes for Artwork, Light Image	98
4.3.2 Emergent Themes for Colour	102
4.3.3 The Influence of Perceived Colour and Cognitive Responses	104
4.3.4 Emergent Themes for Texture.....	105
4.3.5 Emergent Themes for Brightness	105
4.3.6 The Influence of Perceived Brightness on Individual	107
4.4 Emergent Themes 2: Personalization.....	108
4.4.1 Family Photos	108
4.4.2 Personal Belongings	109
4.4.3 The Influence of Personalization on Individual	109
4.5 Emergent Themes 3: Mobility and Flexibility	110
4.5.1 The Furniture should have Wheels for Mobility	110
4.5.2 The Influence of Perceived Mobility and Flexibility on Individual	111
4.6 Emerging Themes 4: Technology	112
4.6.1 Internet Access	113

4.6.2 Entertainment	113
4.6.3 PCs or Laptop	113
4.6.4 The Influence of Perceived Technology on the Individual	114
4.7 Quasi-Statistics Associated with the Design Categories.....	114
4.8 Summary of the Findings	116
4.8.1 Summary of Findings: Research Question One	116
4.8.2 Summary of Findings: Research Question Two.....	117
Chapter 5: Discussion.....	120
5.1 Introduction	120
5.2 Developed Environmental Behaviour Theory	121
5.2.1 Contribution of Physical Dimensions.....	124
5.2.2 Interior Conditions.....	124
5.2.3 Personalization as Contribution Physical Dimensions	139
5.2.4 Flexibility and Mobility as Contribution to Physical Dimensions	141
5.2.5 Ergonomics in Hospital Room	143
5.2.6 Views of Nature.....	144
5.2.7 Technology Conditions as a Contribution to Physical Dimensions	146
5.3 Holistic Environment	148
5.4 Internal Responses Contribute to Satisfaction	149
5.4.1 Physiological Responses to Single Occupancy	149
5.4.2 Cognitive Responses to Single Occupancy	150
5.4.3 Emotional Responses to Single Occupancy	150
5.5 Human (Individual) Behaviours.....	151
5.6 Design Configuration.....	151
5.7 Desired Behaviours	153
5.8 Summary of the Discussion	153
Chapter 6: Conclusions	156
6.1 Introduction	156

6.2	Statement of Contributions to Knowledge	158
6.2.1	Physical Dimensions	158
Figure 52: An Important Element for Satisfaction with the Environment		161
6.2.2	Theoretical Dimensions	161
6.3	Limitation of Single Occupancy Study	163
6.3.1	Consultation and ArchiCAD	163
6.3.2	Sample Size	164
6.3.3	The Effect of War in Libya.....	164
6.3.4	Interior Effect	164
6.4	Future Research.....	165
6.5	Summary of the Conclusions	165
Chapter 7: Recommendations		167
7.1	Introduction	167
7.2	Design Guidelines	167
7.3	Three – Dimensional Design of Hospital Rooms	167
7.4	Interior Furnishing	168
7.5	Furniture in Single Occupancy	168
7.6	Technology in Single Occupancy	168
7.6.1	Lighting	169
7.6.2	Colour	169
7.6.3	Wall Texture	169
7.6.4	Window Views	169
7.6.5	Painting and Art Display	171
7.6.6	Layout Arrangement of Single Occupancy	172
7.7	Personalization as Design Element	172
7.7.1	Personalization User Requirements.....	172
7.7.2	En-Suite Bathroom	173
7.7.3	Transferability of Research Findings to other Cultural	173

<i>List of References</i>	<i>175</i>
<i>Appendix A: Consultation Schedule</i>	<i>190</i>
<i>Appendix B: Consent Form</i>	<i>194</i>
<i>Appendix C: Participant Information Sheet</i>	<i>196</i>
<i>Appendix D: Poster</i>	<i>201</i>
<i>Appendix E: Thematic Analysis Art Category</i>	<i>203</i>
<i>Appendix F: Light Image</i>	<i>204</i>
<i>Appendix G: Wall Colour</i>	<i>205</i>
<i>Appendix H: Furniture Colour</i>	<i>206</i>
<i>Appendix I: Curtain Colour</i>	<i>207</i>
<i>Appendix J: Furniture Style</i>	<i>208</i>
<i>Appendix K: Computer, Internet and Phone</i>	<i>209</i>
<i>Appendix L: TV and Music</i>	<i>210</i>
<i>Appendix M: School of Health and Social Care Ethical Approval</i>	<i>211</i>
<i>Appendix N: Tripoli Medical Center Approval One</i>	<i>212</i>
<i>Appendix O: Tripoli Medical Center Approval Two.....</i>	<i>213</i>
<i>Appendix P: Consent form two.....</i>	<i>214</i>
<i>Appendix Q: Consultation Schedule Two</i>	<i>215</i>

List of Tables

Table 1: Human Response to Colour: Source; Pirman (1967).....	47
Table 2: Research Paradigms Source; Adapted from Neuman et al. (2003) (cited by Denzin & Lincoln 1998)	64
Table 3: Research Strategies	70
Table 4: Phases of Thematic Analysis (Boyatzis, 1998).....	85
Table 5: Quasi-Statistics associated with the Design Categories.....	115

List of Figures

Figure 1: The Structure of the Introduction	1
Figure 2: An Illustration of Theoretical Framework on Design Preference	7
Figure 3: The Impact of Physical Surroundings on Customers: Source: Adapted from Bitner (1992) and Modified by Researcher.....	9
Figure 4: Framework for Understanding Hospital Healing Room: Source: adapted from Fottler et al; 2000	12
Figure 5: Illustration of the Research Study Approach.....	17
Figure 6: Structure of the Dissertation	20
Figure 7: Structure of Part Two DVD	24
Figure 8: The Structure of the Literature Review	25
Figure 9: Environmental Comfort Model Pyramid: Source; Adapted from Vischer 2005 and Modified by the Researcher	59
Figure 10: The Structure of the Material and Methods.....	63
Figure 11: The Design Process	75
Figure 12: Single Occupancy	77
Figure 13: Single Occupancy 3D Perspective.....	78
Figure 14: Single Occupancy with Furniture	78
Figure 15: Single Occupancy 3D	79
Figure 16: Elevation.....	79
Figure 17: Transformation of the Room	80
Figure 18: Isometrics.....	80
Figure 19: Perspective.....	81
Figure 20: Summary of Single Occupancy Research	91
Figure 21: The Structure of the Research Findings	93
Figure 22: Keys of Thematic Analysis.....	95
Figure 23: Environmental Aesthetics Component	97
Figure 24: Nature and Tree	99
Figure 25: Wall Colour	103
Figure 26: Floor Colour	104

Figure 27: Flow Diagram showing Participant's Response to Aesthetics: Source:	
Researcher	105
Figure 28: Light and Cool Environment	107
Figure 29: Family Photo	109
Figure 30: Flow Diagram showing Participant's Response to Personalization: Source:	
Researcher	110
Figure 31: Flexibility	111
Figure 32: Flow Diagram showing Participant's Response to Mobility and Flexibility:	
Source: Researcher	111
Figure 33: Internet and Laptop for Communication	113
Figure 34: Flow Diagram showing Participant's Response to Technology: Source:	
Researcher	114
Figure 35: The Structure of this Chapter's Discussions	121
Figure 36: Source: Researcher's Developed Framework.....	123
Figure 37: Artwork.....	130
Figure 38: Preferred Artwork.....	130
Figure 39: Qu'ran Karim.....	131
Figure 40: Al- Masjed Al-Haram and Ka'ba.	132
Figure 41: The name of Prophet Mohamed in Green and White.....	133
Figure 42: Al- Masjed Al-Haram 2.....	134
Figure 43: Colour Samples.....	136
Figure 44: Brightness in Single Occupancy.....	137
Figure 45: Brightness 2.....	137
Figure 46: Hospital Mobile Bed.....	142
Figure 47: Reclining Chair.....	143
Figure 48: Ergonomics in Rooms Design	144
Figure 49: Preferred Views of Nature.....	146
Figure 50: The Structure of the Conclusions	156
Figure 51: Contribution to Well-being.....	157
Figure 52: An Important Element for Satisfaction with the Environment.....	161
Figure 53: View 1	170

Figure 54: View 2	170
Figure 55: View 3	171

Chapter 1: Introduction and General Information

1.1 Introduction

In this chapter the background to the study is described. The purpose and significance of the study is explained. The theoretical framework is introduced, the research question is formulated and an overview is given of the aims and objectives of the study. This is followed by a brief description of the research method used in the study. This chapter is divided into the following sections as shown in figure 1.

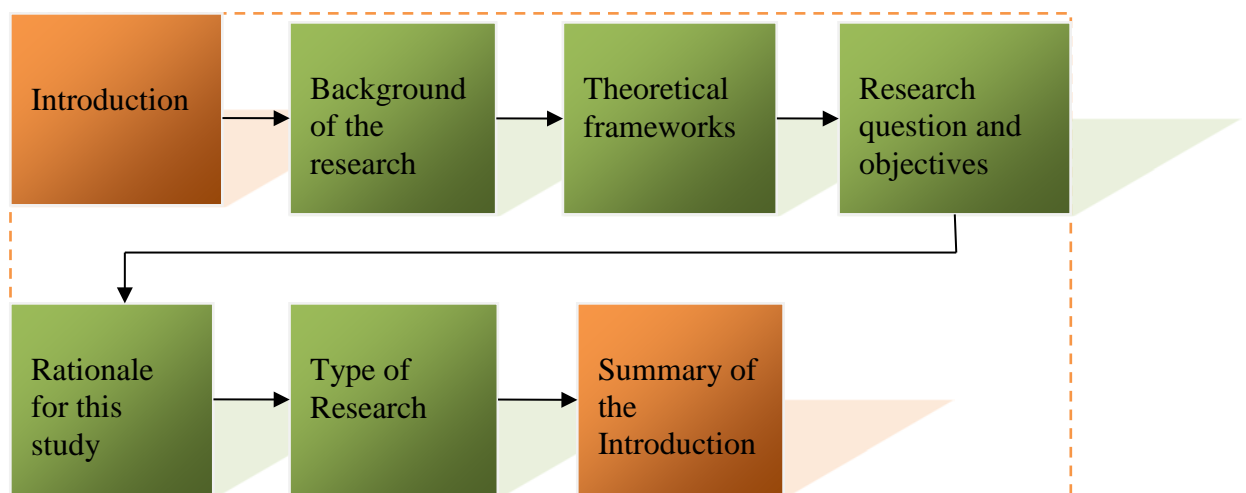


Figure 1: The Structure of the Introduction

1.2 Background of the Research

1.2.1 Researcher's Perspective Informing This Research

I am a lecture at Tripoli University, in the Department of Interior design, and a committed senior lecturer with over 7 years of experience in academic institutions teaching student from various cultural backgrounds in the field of art and interior design.

As a researcher, it is vital to write and explain the orientation that I bring to the “Preferred hospital rooms” research study.

There is a disconnect in most previous design studies, between designers and health professionals. High level research on either side requires both social science and design

knowledge. This study attempts to bridge this disconnect to make invaluable contributions.

From conversation with family and friends who were hospitalized, I understood that the hospital physical setting did not meet patients' needs, and there is a demand for high quality environments that support healing and well-being.

The literature review clearly indicated that poorly designed hospital rooms did not meet patients' needs and may lead to an uncomfortable environment (see chapter two).

This study distinguishes itself from previous research by focusing on public preference in hospital single occupancy rooms. It gives eminence to public preference in the design of single occupancy rooms.

My personal research interest in this topic is driven from experience by visiting my family and friends at hospital and its the researcher view's that hospitals in Libya did not meet patient's needs.

Improving the quality of healthcare settings and hospital interior design will enhance patients' satisfaction with hospital rooms. The use of a new technique, using a newly qualitative methodology, such as CAD consultation and co-present collaboration, proved to be effective techniques. The approach involves making use of CAD software for data collection (refer to chapter four section 3.4.4 for more detail). The outcome of using the innovation of CAD technology was very accurate for gathering data, which helps respondents to accurately map their preferences, in order to arrive at an understanding and interpretation of how people create and maintain their social worlds.

1.2.2 Context

According to Fischi (2005) the environment has the potential to affect us in either a negative or a positive way. By the term "environment", he was referring to the form of buildings, colour, lighting, materials and other factors in the built environment. The design and décor of buildings has an even bigger impact in a hospital environment (Fischi, 2005).

Fischi (2005) goes on to say that, while medical science continues to progress, the hospital physical environment receives no further attention. In a sense, it remains sterile and lifeless (Fischi, 2005). This is somehow ironic in the sense that a hospital should be

a place where people come to regain their life from the life imbalances which cause them to be sick. In addition to the stress caused by medical procedures, patients' sick condition is compounded by inappropriately designed healthcare facilities (Fischi, 2005).

Sickness makes people anxious and according to Dijkstra (2008), is also associated with a great degree of uncertainty, fear and stress. Poorly designed rooms in hospitals with inappropriate décor further compound an already uncomfortable environment (Dijkstra, 2008). It is from the above fundamental issues that I derive the purpose of this research.

1.2.3 Industry Background

Until about ten years ago, the primary objective of health organisations was to focus exclusively on the medical needs of patients. However as organisations began to conduct patient satisfaction surveys, they learned that the environment constitutes an important part of the total healthcare experience (Fottler et al., 2000, p. 93).

Research from the Centre for Health Design has shown that the more attractive the environment, the higher the perceived quality of care and the lower the anxiety of patients (Geimer-Flanders, 2009).

To identify environmental sources of satisfaction, Harris et al. (2002) conducted telephone interviews with 380 discharged inpatients. The focus was to determine the relative contribution of environmental factors to overall satisfaction with the hospital experience, and to explore differences in satisfaction across four departments (medical, obstetrics, orthopaedics, and surgical) in six hospitals. Analysis indicated that interior design, architecture, housekeeping, privacy, and the ambient environment were all perceived as sources of satisfaction (Harris et al., 2002).

Environmental satisfaction was a significant predictor of overall satisfaction, ranking below perceived quality of nursing and clinical care. There were no significant differences between hospital departments in the levels and sources of environmental satisfaction. These results suggest potential directions for architects, designers, and health care providers (Harris et al., 2002).

1.2.4 Proposed Knowledge Contribution of Study

This research will enable healthcare interior designers to gain an insight into the colours and interior features people prefer. It will also identify features that can be used in other configurations such as designing double rooms and wards in hospitals. Understanding physical environmental stimuli in hospital rooms will allow designers to create an environment which satisfies the people who use it. This study will identify the preferences of the general public, in order to help different stakeholders as follows:

Interior designers and décor professionals: These individuals design hospital facilities which will contribute to ultimate users' preferences. This study is intended to help them refine their design skills to incorporate features which promote people's well-being.

Other researchers: Once preferred single occupancy room design and décor attributes are identified, other researchers can build on that knowledge to investigate whether preferred design and décor actually improve the healing process. Accelerating the healing process specifically refers to reducing the average number of days that patients spend in hospitals due to a quicker healing process.

1.2.5 Built Environment and Design Research

Brill and Villecco (1981) stated goals for the built environment design research as follows:

- To provide useful information in order to improve the designed environment for people's satisfaction and well - being.
- To create new design concepts and develop design planning processes in order to ensure and realize the intention of the physical environment (Brill and Villecco; 1981, cited in Danielsson, 2005).

The purpose of this thesis is to provide guidelines for the hospital designer to design rooms for patients. This research will identify people's perspectives on hospital room design which will help the designer towards a better understanding of what the client needs. With regards to the importance of interior design Webster and Johnson (1999) states:

“Designers have to consider what is important to and supportive of patients and family satisfaction (Webster and Johnson, 1999, p.88) (cited in Hesham, 2006).

Researchers are endeavouring to improve the quality of our life and to make the world a better place. Their tasks include assessing needs, providing solutions, and solving problems (Patton, 1990).

Research in the health environment should focus on adding value to the body of knowledge of the built environment (Amaratunga et al., 2002). Design research attempts to generate new knowledge useful to designers of policy and interior designers, to improve the quality of our surroundings, and thereby our lives.

Sisson (1978) states that:

“The environmental design can make a positive contribution to socialization, interaction and moral aspects. It could provide an atmosphere of warmth and cheer for the people who are distressed, apprehensive, and may be uncomfortable” (Sisson, 1978, p.19).

Alan Dilani is a researcher at the Karolinska Institute, Swedish National Institute for Health. He is a designer who has design several healthcare interior design. He states that:

“ There is a growing a awareness internationally of the need to create functionally efficient facility that are also human centred environment aimed at enhancing and initiating health processes” (Dilani, 2001, p.32).

Hershberger and Cass (1974) have made us aware that designers are unable to predict from intuition the type of environments that are needed by users, and frequently design building environments that compromise the aspiration of users and at worst are intolerable for them (cited in Hesham, 2001).

1.3 *Theoretical Frameworks: Environmental Behaviours*

This research investigation is embedded in four areas of literature and it is informed by knowledge available around those areas which fill the gaps in current knowledge. Chapter one discusses the theoretical frameworks concerned with environmental behaviour and physical setting, individual behaviours, and internal responses. Chapter

two is concerned with healing environment, human factor, design factor and healthcare design research that focuses on user satisfaction with single occupancy décor and interior design. Chapter three addresses the methods and material. Chapter four is concerned with discussing the findings relating to single occupancy, the theoretical frameworks in relation to user satisfaction and behaviour and how users perceive their surroundings. Chapter five is concerned with the research findings and providing new knowledge and a developed framework which will fill the healthcare design gap.

1.3.1 Environmental Behaviour Approach

The purpose of this research is to adapt the Mehrabian-Russell model (1974) to the environmental setting and to test predictions from this model in order to improve hospital room design. This theoretical frame work was developed in 1992 by Bitner.

Mehrabian and Russell model frameworks would appear to have valuable applications to single occupancy settings. The theoretical model was developed by environmental psychologists Mehrabian and Russell 1974; Mehrabian, 1980; Russell and Pratt, 1980; and recently by Bitner, 1992. This framework appears to be particularly valuable in studying and understanding the physical setting and individual interactions within the environment and how people perceive their surroundings. Mehrabian and Russell (1974) defined the approach as:

"Centres on the use of human responses to environments as intervening variables linking the environment to the variety of behaviours it elicits" (cited in Billings, 1990).

Figure 2 shows the conceptual frameworks addressing the question of how planning and designing an environment could achieve satisfaction and may enhance the environment and user's well-being. This framework is rich for addressing such questions and for exploring the role of the physical setting in hospital rooms.

Mehrabian and Russell (1974) designed a similar model for addressing human behaviour including, responses and their interactions and its application to physical settings (Bitner, 1992). In the following section all components of the framework are defined and discussed.

1.3.2 Human Behaviours

According to Bitner (1992) human behaviour is affected by the physical setting. The author indicates that until the 1960s psychologists largely ignored the effects of the physical setting in an attempt to explain behaviour (Bitner, 1992). Since that period, several researchers in the field of environmental psychology have addressed the relationship between humans and their surroundings (Gilbert, 1985; Russell and Ward, 1982).

Human behaviours are influenced by the physical setting (Bitner, 1992). People perceive different environmental elements in different ways. Their perception is affected by mood, personality and experience (Fottler et al., 2000).

The perception of the physical environment leads to emotions, and physiological responses which affect the individual behaviour (Mika, 2008).

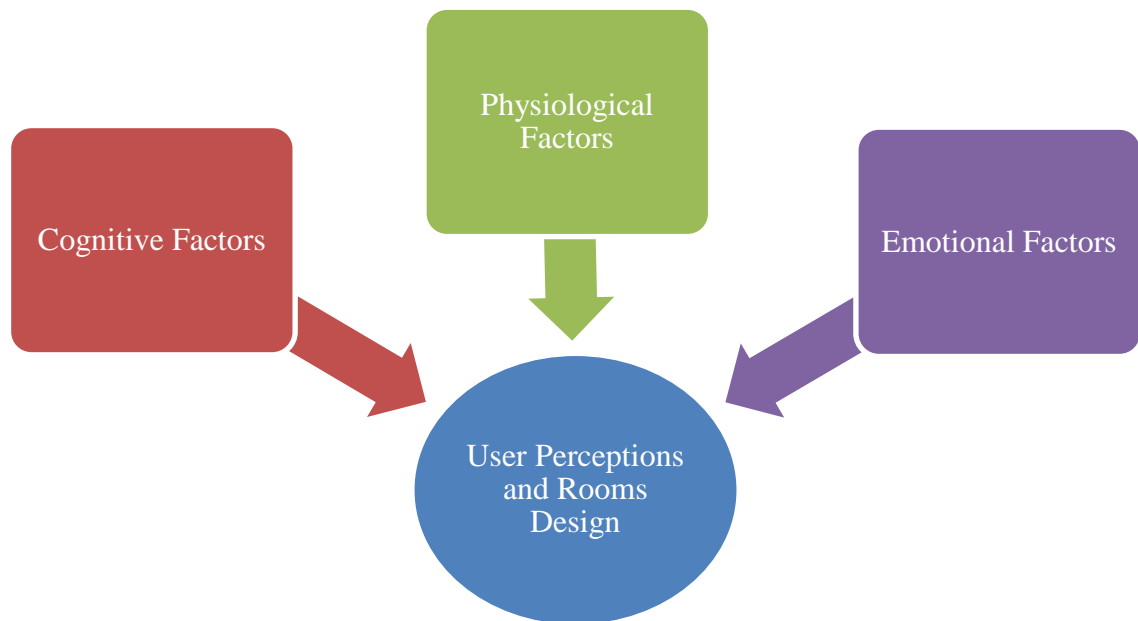


Figure 2: An Illustration of Theoretical Framework on Design Preference

As seen in figure 2, Individual behaviours are a result of internal responses to the environment the internal response could be divided into emotional, cognitive, and

physiological responses (Mika, 2008). Each individual is a little different from the other, which makes it even more challenging for the healthcare provider and the designer. The kinds of human behaviour which are influenced by the physical setting are discussed next. These differences are as illustrated above in figure 2.

Fottler et al. (2000) said that a patient responds to the environment in three ways: physiologically, cognitively, and emotionally. Bitner's servicescape frameworks (1992) also emphasise that interior elements influence user behaviour. Individuals may respond to the physical environment with either approach or avoidance behaviour (Binter, 1992).

Approach behaviour involves positive response to the environment. In single occupancy study, users may respond positively to wall colour, artwork, lighting, and that may make them feel happier being in such an environment. Opposite responses are referred to avoidance behaviour, such as the user's desire not to stay in an unpleasing environment (Bitner, 1992). Avoidance behaviour arises when a user is not satisfied by the quality of the environmental surroundings.

This theory applies to hospital room users. If their environments are uncomfortable, and make them feel isolated or afraid, they may wish to leave hospital before their treatment is completed. If they can't leave, they may suffer unnecessary anxiety or fear.

Environmental cues, such as nice artwork, lighting, colour, and music could make the difference which leads to user satisfaction. As shown in figure 3, the positive or the negative responses from the user are determined by (physiological, cognitive, and emotional).

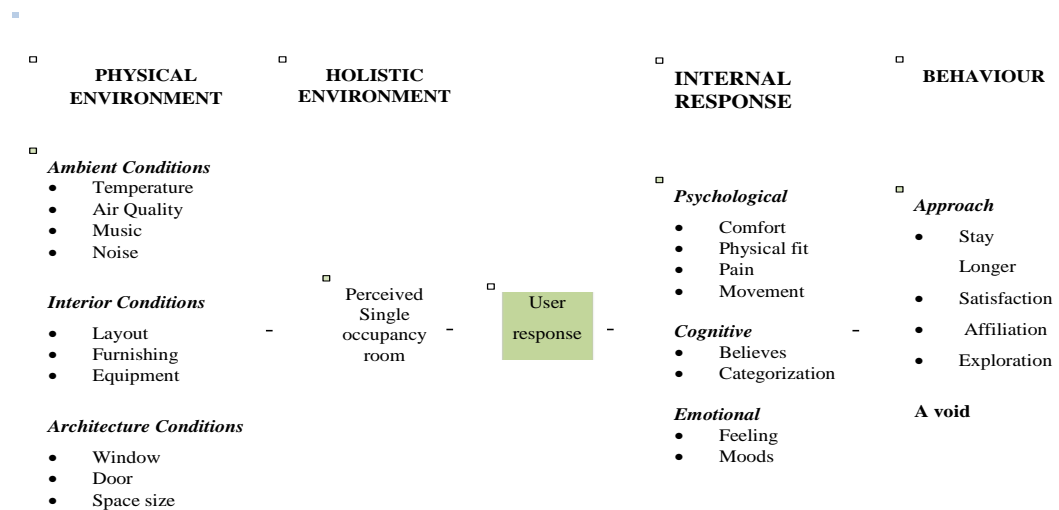


Figure 3: The Impact of Physical Surroundings on Customers: Source: Adapted from Bitner (1992) and Modified by Researcher

1.3.2.1 Individual Behaviours

Environmental psychologists suggest humans react to places with two forms of behaviour: approach and avoidance (Mehrabian and Russell, 1974).

Bitner (1992) the assumption is that positive responses may lead to approach behaviour (staying longer in the place, satisfaction with the place, affiliation to the place, and exploration) and on the other hand negative responses lead to place avoidance (Bitner, 1992).

For example if patient comes to a hospital with the purpose of healing and then gets hospitalized in single occupancy where he can't sleep because the bed is uncomfortable or the furniture of that room is unsuitable then this condition may have an effect on that user and that may lead to an avoidance emotional response.

As figure 3 shows, the approach avoidance behaviour of the user are determined by individual internal responses (emotional, cognitive, and physiological) to hospital room behaviour (Bitner, 1992). Internal responses are discussed in detail subsequently.

Bitner (1992) indicated that the internal response leads to approach or avoidance behaviours. Positive (negative) internal response leads to approach (avoidance)

behaviours (Bitner, 1992). For hospital room users approach behaviour such as affiliation, satisfaction, stays longer, will support the purpose of being in a hospital room. Avoidance represents opposite behaviour which in the case of the hospital room is the desire to leave.

Healthcare designers face a big challenge in designing hospital rooms which can enhance user satisfaction. One challenge in designing an environment (hospital room) is to enhance individual approach behaviour (Bitner, 1992).

Environmental psychology researchers strongly suggest that the physical environment can influence behaviours in several ways (Bitner, 1992) therefore the first step in the purposeful design of a hospital room is to identify desirable settings in the hope of enhancing the behaviour of customers through its physical facility (Bitner, 1992). For example, in designing hospital rooms the first task is to identify the goals of the hospital room and what the hospital wants to achieve. Hospital goals are always to please their customer and enhance well-being during hospitalization.

The positive user behaviour is associated with healing, therefore the healthcare designer should propose designs which would be conducive to this behaviour and ultimately support the goals of the hospital (Bitner, 1992). Once the desirable designs are identified, then Bitner's challenging questions emerge:

What internal responses (feeling, beliefs, and comfort) will lead to the desired behaviours and how should the environment be configured to bring about such responses?

This research is designed to identify the features preferred by the general public with a focus on single occupancy rooms. Once this question is answered then Bitner's question will be answered to fill in the current knowledge gap.

This is to arrive at a description of preferred interior design elements and what constitutes user comfort. Environmental comfort comprises three categories: Physical comfort; Functional comfort, and Psychological comfort.

1.3.3 Internal Responses to the Physical Setting

As figure 3 shows, environmental psychology literature indicated that users respond to their surroundings in three dimensions, cognitively, emotionally and physiologically. The perceptions of the physical environment could lead to specific emotions, beliefs, and physiological responses which in turn affect behaviours (Mika, 2008). The internal responses are divided into Physiological, cognitive, and emotional responses. These responses are explained below:

1.3.3.1 Physiological Responses

Fottler et al. (2000), indicates these are the body's reaction to external stimuli (e.g. cold or heat), and includes the mind's limitation in processing information. People may react purely physiologically to features such as air quality, sound, and temperature that may cause discomfort in the environment (Mika, 2008). Individual physical responses may affect how long users stay in hospital rooms. In this research a person's preference for particular hospital will be impacted by their physiological responses. There are some designs which may elicit a certain physiological response in the patient's body which would lead their preference of the facilities.

1.3.3.2 Cognitive Response

Cognitive response refers to a person's expectation of the environment based on the prior experiences of people and non-verbal communication evoked by the physical cues in the environment. Fottler et al. (2000) say that the tendency of people is to seek a point of similarity between what we have seen or experienced in our life. Cognition is the mental processing of sensory information (Mika, 2008). The more familiar a hospital room, the less confusion and unhappiness a patient will experience (Fottler et al., 2000).

In this study the respondent's cognitive association with either past healing or their own home design will affect their preferences. For instance if in the past the patient got recovered quickly in a blue painted room where a painting was hanging, they would associated the past event with healing and thus indicate a blue painted room with some art as their preferred design and décor.

1.3.3.3 Emotional Responses

According to Bitner (1992) internal responses may elicit emotional responses, which could influence an individual's behaviour. Emotional responses are divided into two dimensions, pleasure and arousal. The positive behaviour is normally created through pleasure and arousal (Mika, 2008). Pleasure can be achieved through an aesthetically pleasing surrounding. Arousal could be created through complexity, such as using a poor room interior design.

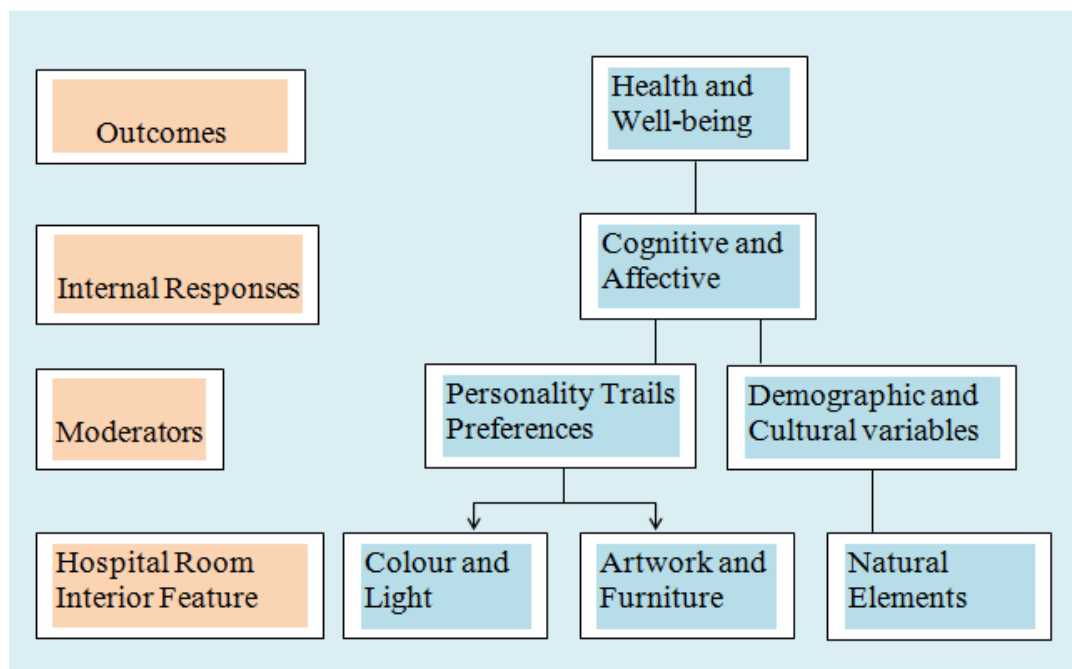


Figure 4: Framework for Understanding Hospital Healing Room: Source: adapted from Fottler et al; 2000

Hospital design and décor professionals and all healthcare providers require conditions that promote patient healing and satisfaction. Those experiences that create displeasure are viewed negatively and those that create pleasure are viewed positively.

Fottler et al. (2000) states that a patient's response to the environment affects their preference towards hospital single occupancy rooms. A framework for understanding hospital rooms was constructed. This interaction between the patient and hospital single occupancy room is illustrated in figure 4 above.

1.3.4 Dimensions of the Interior Environment

Bitner's (1992) framework divided the physical dimensions into three categories namely; ambient conditions, interior conditions, and architecture.

Ambient conditions refer to characteristics of the interior environment which affect the five human senses (Lovelock and Wirtz, 2007). Single occupancy interior elements should be compatible with the preferred environment to enhance user satisfaction. The ambient category includes lighting, music, smells, and scents. These elements in the category could create positive responses. For example the lighting level may improve the environmental conditions.

Interior design condition: layout and functionality refers to equipment and arrangement, the size and the shape of furniture (Bitner, 1992). Functionality refers to the use of the equipment (Zeithaml et al., 2006). In a hospital room, the designer should consider factors that facilitate a positive environment. Architecture conditions refer to characteristics of the architecture such as size, the door and window locations. Architectural elements are permanent and no significant change can be made to these elements.

1.3.5 Human Behaviour within Physical Setting

Environmental researchers argue that the physical setting may influence the user's satisfaction with the environment (Mary, 2001; Anderson, 1980). This section discusses the relationship between hospital room occupiers and their interior environment; it also explains how people perceive their surroundings. Perceptions of environmental users are affected by sociological needs, psychological state, and individual differences (Edward, 1990).

The single occupancy interior itself also affects and influences human behaviour. The state of both mental and physical stimuli affects behavioural responses to the environment (Edward, 1990). In this discussion material is presented that will help the designer to be aware of subjects which affect the individual in single occupancy. The significant factors that affect individual behaviour are as follows: sociological human need, perception, aesthetics and human response to the interior environment.

1.3.6 Sociological Human Need

The environment surrounding the person, his/ her perception of that environment influences an individual's social interaction within that environment. Individual social interaction can be discussed in terms of three fundamental concepts: individual privacy, personal interaction levels within the environment, and territoriality (Hall, 1990).

- A. Privacy:** is identified as a central regulatory human process by which persons make themselves more or less accessible to others (Hall, 1990). In hospital environment, privacy could be provided through the use of single occupancy, and double rooms could be adapted by the use of screen portions, which would prevent physical and visual contact between individuals.

The healthcare service provider should plan and enhance the use of single occupancy in hospital, which in return will enhance individual privacy level in hospital rooms. Edward T. Hall (1990) defines four distinct distances at which interpersonal transactions normally take place. It is significant to understand those categories, and the designer should apply the ergonomic rule to the plan of hospital room design. Each aspect of single occupancy plan, which includes the space furnishing, needs to be carefully assessed in terms of its compatibility with the human body.

The challenge is to plan for the hospital room user activities, furnishings, and finishes that are appropriate for the occupier. Ergonomics combines anthropometrics (human body measurement data) and the space for his circulation within the space which for example allows the hospital nurse to move around the room easily. Those three categories are as follows, intimate, personal, and social.

Intimate space: is that area immediately surrounding the individual's body. This area is the most private which involves both physical and emotional response (Edward, 1990).

Interior personal space: is that area within which users allows only select friends, or family with whom personal conversation is mandatory (Edward, 1990).

Social space: is that area within which the users expect to make purely social contacts on a temporary basis with others (Edward, 1990).

B. Territoriality: is a means of achieving a desired level of privacy. It involves the exclusive control of a space by an individual (Edward, 1990). In this study the individual may consider their room as their territory and make the place personal, and consider personalization of the space. Users personalize their spaces for expressions and emotional ties with their existing environment (Lily, 2010).

1.4 Research Question and Objectives

1.4.1 Research Question

Question 1:

What are the interior design and décor features preferred by the Libyan general public in hospital with special focus on single occupancy rooms?

Question 2:

What internal responses will lead to the desired behaviours (satisfaction) and how should the single occupancy rooms be designed to bring about such responses?

The first question has been developed based on Bitner's (1992) theory to provide the interior designer with a holistic understanding of the public's preferred interior elements and experience of single occupancy rooms in hospital and how people perceive room décor and the interior element.

The second question was developed to address the single occupancy user's satisfaction with the hospital room, such as environmental comfort and understanding of physical comfort, functional comfort, and psychological comfort. Bitner (1992) asserts that human behaviour is affected by the physical setting; he goes on to say until 1960s psychologists ignored the effect of the physical setting in an attempt to explain behaviour. A comprehensive discussion about behaviour and how each element is perceived is presented in Chapter Two.

1.4.2 Objectives of the Research

The primary objectives of the research are:

- (a) To identify single occupancy interior design and décor features preferred by the general public.

This is to arrive at a description of preferred interior design elements and what constitutes user comfort. Environment comfort comprises three categories: physical comfort, functional comfort, and psychological comfort.

- (b) To recommend single occupancy interior design and décor features that can be used by a healthcare designer.

These recommendations will enhance hospitalization and user's satisfaction that leading to positive results which will be useful for the designer and policy maker.

- (c) To create a guiding document, for design and décor professionals, on the use of various aspects of design and decor in a healthcare environment.

1.4.3 Rationale for this Study

This study was about researcher and participant's collaboration in design processes, and the discussion of interior design elements. Good research is research conducted with people rather than on people (Heron and Reason, 2001, p. 179).

The outcome of good research is not just books and academic papers, but is also the creative action of people to address matters that are important to them. Of course, it is concerned too with revising our understanding of our world, as well as transforming practice within it (Heron and Reason, 2001, p. 179). Figure 5 below was designed by the researcher to illustrate this study approach

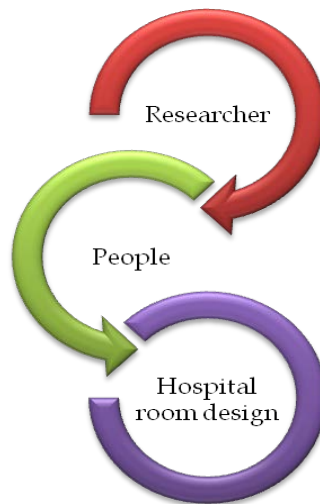


Figure 5: Illustration of the Research Study Approach

Heron and Reason (2001) state that:

“We believe that good research is research conducted with people rather than on people... We believe that the outcome of good research is not just books and academic papers, but is also the creative action of people to address matters that are important to them.”

In recent years, healthcare service providers and interior designers are actively re-considering the design of hospital environments. They are finding ways of improving physical settings of hospitals since design is a valuable factor in public satisfaction. This is due to a growing recognition that interior design and décor are important tools for creating a positive environment.

A literature review was conducted on how each interior design element can be effectively used in hospital room design. It further supports the belief that, having a better hospital environment increases people’s satisfaction and well-being.

1.5 Type of Research

1.5.1 Qualitative / Quantitative Approach

Myers (1997) distinguished between qualitative and quantitative research methods saying quantitative research methods were originally developed in the natural sciences to study natural phenomena. Examples of quantitative methods now well accepted in the social sciences include survey methods, laboratory experiments, formal methods (e.g. econometrics) and numerical methods such as mathematical modelling.

Myers (1997) further states that qualitative research methods were developed in the social sciences to enable researchers to study social and cultural phenomena. Examples of qualitative methods are action research, case study research and ethnography. Qualitative data collection methods include observation and participant observation (fieldwork), interviews and questionnaires while data sources include documents and texts, and the researcher's impressions and reactions (Myers, 1997).

As this research would seek to understand people and the social and cultural contexts within which they live and may want to live, a mainly qualitative approach to data gathering shall be used. The selection of a qualitative approach also fits well with Hussey and Hussey's (1997, p. 20) views who defined qualitative research as a subjective approach as in this research which focuses on identifying hospital room features that the general public prefers.

1.5.2 Deductive / Inductive Approach

Hussey and Hussey (1997, p.19) defined deductive research as a study in which a conceptual and theoretical structure is developed which is then tested by empirical observation; thus particular instances are deducted from general influences. Deductive research is a study in which theory is tested by empirical observation.

The deductive method is referred to as moving from the general to the particular. Inductive research, on the other hand, is a study in which theory is developed from the observation of empirical reality; thus general inferences are induced from particular instances, which is the reverse of the deductive method since it involves moving from

individual observation to statements of general patterns or laws (Hussey and Hussey, 1997, p.13).

The inductive research method also fits in well with the interpretive social science research philosophy as shown above. In this research, individual preferences regarding the interior decor for single occupancy rooms are gathered. A theoretical framework was developed that is intended to fill the knowledge gap in understanding environmental behaviour.

1.6 List of Definitions of Terms

Healing Environments: an environment which promotes healing like those prevailing in some hospitals. Aesthetically pleasing environments which convey a message of calmness and support healing (Kerfoot and Neumann, 1992) will be preferred.

Aesthetics: These are defined in the Oxford English Dictionary as those aspects “closely related to creating a therapeutic attractive environment” (Oxford English Dictionary, 2008).

Architectural Features: These are relatively permanent characteristics, such as the layout of the hospital, room size, and window placement.

Cognitive Evaluation: This is a psychological process; the way people acquire, retain, and process new information about their surroundings and environment.

Décor: Refers to the decoration and furnishing of a room.

Interior Features: These are less permanent elements, such as colour, furnishings, artwork, plants, and light.

Likeability: Refers to the preferred environmental aesthetic experience.

Physical Environment: Harris et al. (2002) say this refers to features like architectural, interior, and ambience.

Single Occupancy: Refers to hospital wards in which patients are accommodated in single rooms.

Brightness: refers to the amount of light, the type of wall colour, and the art work that represent nature and clear sky and sunshine.

1.7 Structure of the Present Dissertation

1.7.1 An Overview of Thesis Chapters

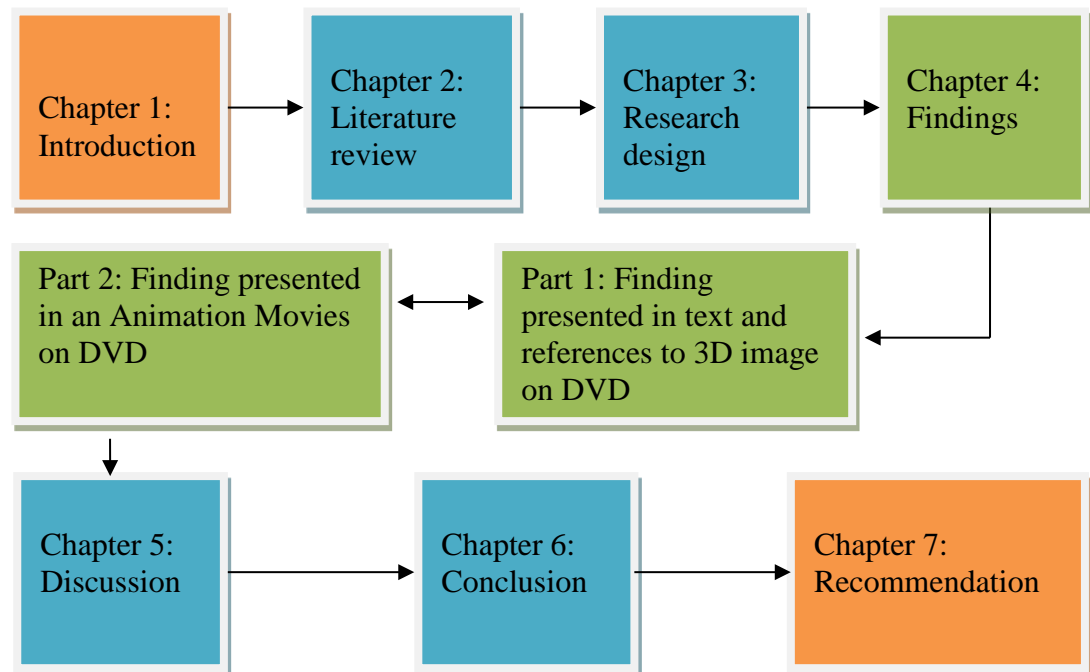


Figure 6: Structure of the Dissertation

This structure is presented in two sections. Section one is concerned with the text material presented in this dissertation, and the second section is concerned with the second part (Visual package DVD) which is enclosed and attached to this thesis dissertation.

Chapter One: Introduction

In this chapter the reader is introduced to the industrial background of hospital room design and the concepts of built environment and design research is described. The purpose and significance of the study is explained. The research investigation is embedded in several areas of discussion and it is informed by knowledge available around those areas which fill the gaps in current knowledge of environmental

behaviour. Chapter one discusses the theoretical frameworks concerned with environmental behaviour and physical setting, individual behaviours, and internal responses. The theoretical framework was translated into the research question and objectives of the study. This is followed by a brief description of the research methodology used in the study and an outline of the rest of the chapters of the thesis.

Chapter Two: Literature Review

This chapter is embedded in four areas of literature and it is informed by knowledge available around those areas which fill the gaps in current knowledge. This chapter discusses the theoretical frameworks in relation to environmental behaviour and physical setting, individual behaviours, and internal responses with a focus on the interior design category only. The dimensions of the physical setting are also discussed briefly. The discussion was structured according to Bitner's (1992) theoretical framework. Each of Bitner's component frameworks is defined and discussed.

In this chapter the reader is introduced to the concepts of hospital design, interior design and physical setting. An overview of healthcare design research, the concept of interior design, and sensing of the interior environment was described. The difficulty of designing interior space is described and the key concepts of this research's theoretical framework are outlined. The concepts of healing environment, the physical environment, and the interior design effects on healing are clarified for the reader.

In this chapter the reader is introduced to the literature review. Since this research study is the first of its kind, there was no such study located within the healthcare or academic database on preferred hospital single occupancy. However, creativity was introduced in the way in which the literature review was done. The researcher's review of the physical setting of the hospital room was divided into three categories. Those categories are architecture, ambient, and interior design. Then the researcher located each element of the interior room separately, such as colour, light, artwork and window views, to build the literature review since those elements had been studied individually by several researchers.

Chapter Three: Research Design

In this chapter the Qualitative research methods are discussed. This chapter covers the intended methodology and proposed study methods and why this method has been chosen for this research. It outlines the research philosophy underpinning the thematic analysis and the interpretive approach, research design, sampling procedures, data collection and analysis approaches, and a few methodological and ethical considerations. The issues of rigor and establishing trustworthiness, and ethics are described. This is followed by a detailed discussion of utilizing ArchiCAD software and the process of creating the design during the data collection. The steps in preparing for the consultation session are described.

Chapter Four: Findings

In this chapter, I have presented the data obtained from my consultations with participants. The results are concerned with the participant's preferred single occupancy, interior and décor features and the kind of internal responses which lead to satisfaction. The main finding is presented in text and 3D images as well as Animation Movies of single occupancy in hospital.

There is a reference within the text to each finding which leads the reader to view the image saved on the enclosed DVD as he reads the text, then watch the Animation Movies subsequence. In studying the preferred single occupancy interior design features, I have uncovered elements that lead the designer to a better understanding of participants' preferred hospital room design; and how the design process can be understood in order to create future hospital rooms. Then individual behaviour in relation to single occupancy findings is discussed.

I have analysed the data and I present it in this chapter and subsequently discuss my findings which are intended to make the design process meaningful for the designer and satisfy the needs of a participant in a hospital room. A summary of findings presenting both research questions was given.

Chapter Five: Discussion

This chapter is embedded in six areas of discussion and the literature. It is informed by the finding of the research and knowledge available around those areas which fill the gaps in current knowledge. This chapter discusses the researcher's own developed theoretical frameworks in relation to Environmental-User relationships in a healthcare setting and interior design, the contributions of physical dimensions, behaviour and physical setting, internal responses and individual behaviours, design configuration, and desired behaviour.

The contributions dimensions of the physical setting are discussed. Each of the researcher developed components frameworks are defined and discussed. Researcher Propositions based on the developed concept framework is highlighted in figure 36 that is presented in this chapter. The attention centres first on participant preferred interior elements and on user's behaviour that is influenced by the physical setting and then on user internal responses, individual behaviour, design configuration, and on the (desired behaviour) controllable dimensions that constitute environmental satisfaction within healthcare and single occupancy in hospital. The findings of this study reveal that four major aspects which mainly influence satisfaction are environmental aesthetics, personalisation, technology, mobility and flexibility.

Chapter Six: Conclusion

In Chapter Six, the research journey is discussed and how the choice of method was made and why. A contribution to knowledge section is presented in which the technology condition is discussed. The conclusion of my study is presented, and some challenges and limitations of the research are identified.

Chapter Seven: Recommendation

This chapter outlines those basic interior design recommendations to the design process of hospital single occupancy rooms. This recommendation can be expanded and adapted for double room. The necessary information was gathered during the consultation session that contributed to the important information. The interior design findings were combined together to create participant preferred hospital single occupancy.

1.7.2 An Overview of the Visual Package

This section shows the contents of the attached visual package (DVD). The main finding was presented in text and, within the text there are references to the 3D images as well as to the Animation Movies of single occupancy findings. Those references are made within the text which leads the reader to view the 3D image, and watch the Animation Movies subsequence.

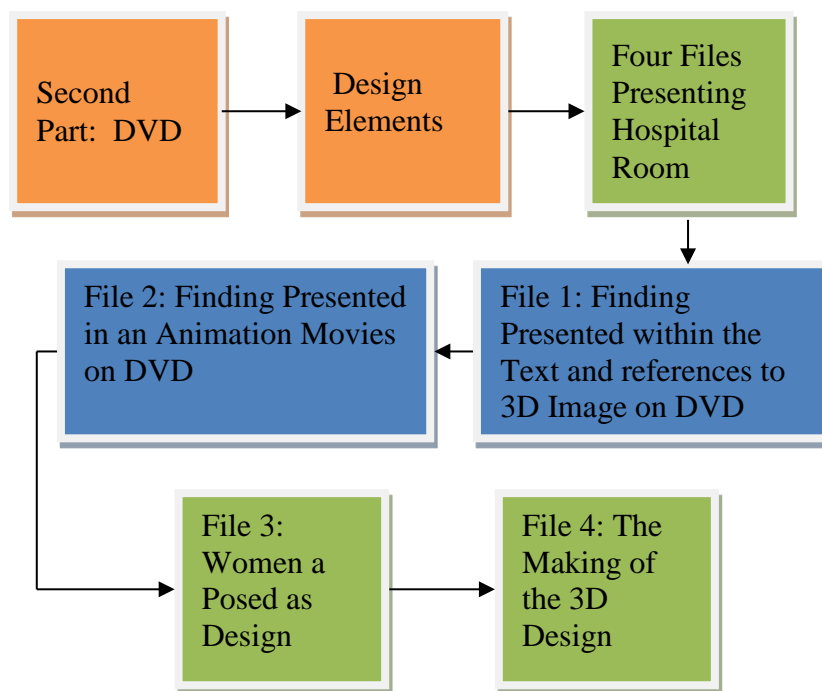


Figure 7: Structure of Part Two DVD

1.8 Summary of the Introduction

In summary, in chapter one the background to the study was described. The purpose and significance of the study was also explained. The research question is formulated and an overview of the aims and objectives of the study was given. This was followed by a brief description of the research methodology used in the study and an outline of the rest of the chapters of the thesis. The design material was also described as significant part of this dissertation. In the next chapter an overview of healthcare room interior design will be presented and interior design concepts will be described.

Chapter 2:

Literature Review

An Overview of Healthcare Design Research and the Physical Setting

2.1 Introduction

This chapter presents the orientation to the knowledge bases with regards to the topic of single occupancy design. It is structured in six areas of literature and it is informed by knowledge available around those areas which fill the gaps in current knowledge. This chapter discusses the theoretical frameworks in relation to environmental behaviour and physical setting, individual behaviours, and internal responses with focus on the interior design category only. The dimensions of the physical setting are also discussed briefly.

Each of Bitner's component frameworks was defined and discussed throughout this chapter. The healing environment, human factor, design factor and healthcare design research that focus on user satisfaction with single occupancy décor and interior design and how interior elements are perceived and how they respond to each element are discussed.

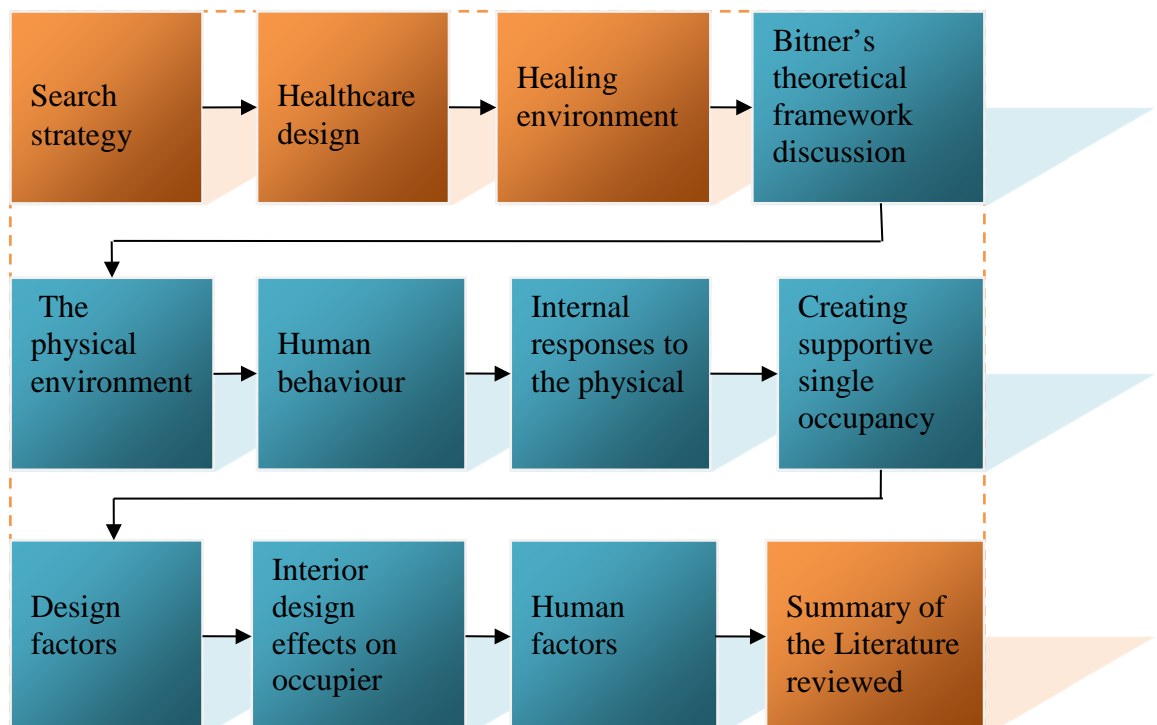


Figure 8: The Structure of the Literature Review

Environmental aesthetics, light in the healthcare environment, art in the healthcare environment, colour in the healthcare environment and nature in the built environment are discussed in relation to Bitner's theory. This chapter is divided into the following sections as shown in figure 8 above.

2.2 *Search Strategy*

This research is aimed at creating an awareness, which would lead to a convergence of designer and décor skill with general public requirements. General public design and décor preferences are not clearly documented in hospital. Many researchers have outlined their view with regard to healthcare environments and this document critically evaluates some of their work.

In recent years design and decor professionals, including healthcare service providers, began to consider how to improve physical settings of hospitals to increase customer satisfaction. There is growing recognition of interior design and décor as a means of creating a positive healthcare environment.

This belief derives partly from Florence Nightingale (1859) who suggested that people would recover much quicker if they were cared for in an environment that had good lighting, colour and views of nature (Altimier, 2004).

The researcher considers it important to identify people's preferred environment and apply these preferences to the healthcare facility's physical setting. It is the researcher's considered view that this would increase patients' well-being and satisfaction.

2.2.1 *Limitation of this Study*

It is not the researcher's intention to provide evidence about the effect of the physical setting or the interior design influence on patient recovery in single occupancy rooms, but to identify the preferred interior and décor element in single occupancy rooms to enhance public satisfaction with healthcare design.

2.2.2 *Literature Search*

The review of the literature is very significant for this study. This review was conducted using the Alderson et al. (2003) Cochrane Collaboration method. Electronic

searches were employed using databases on Interior Design, Architecture, Psychology, Athens, Knowledge Bank and Science Direct.

The specific subject headings that were used are: hospital interior design, single occupancy design and furnishings, healthcare facility and environment design.

Most of the sources of literature are from the Info4education database; a complete reference source for students, graduates, teachers, lecturers, professors and other academic professionals. The Centre of Health Design database was also used to access to up-to-date publications.

2.2.3 Inclusion/Exclusion Criteria

2.2.3.1 Inclusion Subjects

- Hospital design
- Health promotion
- Single occupancy room
- Healthcare design
- Environmental behaviours
- The effect of the environment on user

2.2.3.2 Excluded Subjects

Articles excluded from research

- Infection studies
- Music therapy
- Light therapy

2.2.4 Categories

The physical environment has been broken down into the following categories

- Interior design features
- Light in healthcare environment
- Art in healthcare environment
- Colour in healthcare environment
- Nature in healthcare environment
- Window views

2.2.5 Theoretical Framework

- Arousal theory
- Environmental stress theory
- Perception theory
- Aesthetic responses theory
- Environmental behaviour theory

The literature review highlights the need for identifying what people need in a healthcare setting to enhance their satisfaction. This includes changes in the interior design and décor features like the colour of the wall, the type of light used, the kind of art, the views from windows, and the furniture.

2.3 Healthcare Design

2.3.1 An Overview of Healthcare Design Research

In recent years hospital design and the healing processes is of increasing concern to designers, architects, healthcare providers and researchers (Devlin and Arneill, 2003). Since 1998 there was a major review of healthcare design which indicated that healthcare providers have reached a point where they have no option but to improve healthcare settings (see Rubin et al., 1998; Devlin and Arneill, 2003; Phiri, 2006; Sheman, 2005; Ulrich et al., 1991).

In the 1970s, Jain Malkin decided to specialize in healthcare designs and healthcare settings. She spent long periods of time searching for literature on space planning, colour and its effect on patients in hospital. She was surprised to learn that little had been written on hospital design and healthcare setting. She stated that there was no article written in the field of healthcare design. She goes on to say today there are more than a thousand interior designers and specialists across the world who are listed as specialist in healthcare (Malkin, 2002). Nader (1989) indicates that “the subject of healthcare interior design is one that will become more and more specific as time passes” (Nader, 1989, p.3).

In the 20th century the healthcare environment was characterized by being lifeless and sterile, due to introducing and focusing on technology which serves precise treatment procedures. This focus no doubt has affected the healthcare setting as it was neglected by hospitals (Stouffer, 2001).

Patients need support in all aspects of hospital care: not only physical attention, consultation, medicine and physical therapy. People also need company and familiarity. All this could be enhanced by the design of the hospital environment, which takes into account the person's needs (Monz and Monz, 2001).

With regard to the healthcare setting designer Hofricchter says:

“The hospital will only be successful if it gives the patient a sense of customer satisfaction. The quality of medical service is also first priority but the build structure is more and more dependent on adapting to the needs and satisfaction of

its customers. The hospital must orientate itself towards a hotel model, in order to develop a modern service for people'' (cited in Donnerbauer, 2004, p. 41).

Malkin (2002) says the environment can decrease the arousing of fear and anxiety when patients have treatment:

''The environment must be clean, cheerful, and non-threatening with contemporary furnishings, pleasing colours, interesting texture, and compatible work of art'' (Malkin, 2002, p.1).

Leather et al. (2003) reveal that the physical design changes that make the environment more comfortable and aesthetically pleasing relieve stress among patients and increase satisfaction with the hospital rooms.

Innovating the design of hospitals by making small changes to the layout, furniture, colour schemes, floor covering and curtains results in positive environmental appraisals, improved occupier mood, altered physiological state and satisfaction among users (Leather et al., 2003).

Ulrich et al.(2004) states that users who can see nature or trees instead of building or car park from their room window will recover more quickly than others who can't see the garden views.

Research also supports the idea that light (natural and artificial) can improve health outcomes. The author goes on to say that research shows that a patient in a brightly coloured room stays for a short time compared to one in a dull room (Ulrich, et al., 2004).

2.3.2 Healing Environment

Healing environment refers to an environment which should prevail in healing institutions like a hospital. Not all healing institutions have aesthetically pleasing environments, which convey a message of calmness and support healing (Kerfoot and Nevmann, 1992). From a Western perspective a 'healing environment' is a relatively new concept. However, this concept is rooted in studies of the impact of institutional environments on human behaviour that have been performed by various disciplines over the last 50 years.

According to Gesler, Bell et al. (2002) and Fornara, Bonaiuto et al. (2002), (cited in Ampt, Harris and Maxwell, 2008) the term healing environments is used to describe the factors that positively affect (both physically and psychologically) the community served by a healthcare facility. This includes the physical setting as well as the organisational culture. Harris and Maxwell (2008) further emphasise the importance of humanising and improving health care environments in order to create a “user-centred” healthcare facility.

Kerfoot and Nevmann (1992) say that healing environments are aesthetically pleasing environments which convey a message of calmness. Malkin (2008) suggests that a well-designed facility has the potential to increase positive emotions which in turn could positively affect patients’ health, and well- being.

Venolia (1988) says that when you are in a healing environment you know it and there is no need for analysis. You somehow feel welcome, balanced, and at one with yourself and the world.

This magical environment which you ‘just know’ is the focus of this research. The researcher wants to identify patient preferences in order to create guidelines for hospital single occupancy designers.

As far back as 1859, Florence Nightingale asserted that environmental factors have an effect on health and recovery.

She is quoted as saying:

“The effect in sickness of beautiful objects, of a variety of objects and especially of colour is hardly at all appreciated. I have seen in fevers (and felt, when I was a fever patient myself) the most acute suffering produced from the patient not being able to see out of a window and the knots in the wood being the only view. I shall never forget the rapture of fever patients over a bunch of bright coloured flowers” (Palmer and Nash 1997, p. 148)

If observations about how the physical environment can impact on patients date back to the 19th century, why is it there is little evidence of improvement on interior designs in healthcare facilities? Probably costs are a major setback when it comes to the designing of hospital single occupancy rooms.

According to Watson (1999), Nightingale's Notes on Nursing (1992), references were made on the environments' effects on health and healing. By the term environment, she was referring to the form of buildings, lighting, colour, paintings and the ambient conditions of the physical setting. Nightingale (1992) remarked on the environmental categories of lighting, views of nature, trees, colour, form, flowers, and paintings. These are all non-invasive, non-intrusive and they are importance in one's healing (Watson, 1999).

Watson (1999) supports the idea that the physical setting has to be reconsidered for creating healing space, and to determine if we can accommodate the integration of the physical and metaphysical, mythical, metaphorical, symbolic and archetypal aspects of healing.

This link of thinking is consistent with Kaiser (1988), who remarked that sick hospitals cannot heal patients, he goes on to say, "now we have to pay attention to the subtle environment of the hospital" (cited in Watson, 1999).

Miles (1992), however, states that an artist's insights in the design and planning of these elements, (architectural designs and interior features), can be cheaper than retrofitting, and the effect on the overall atmosphere of the facility can be profound.

Before a patient even reaches the doctor's office, there are environmental factors that affect his or her psychological and emotional responses to the upcoming clinical encounter and the outcome is already engaged.

Miles (1992, p. 27) Director of the British Health Care Arts Centre, states that:

The interface of doctor and patient occupies a small part of the time during which a person is hospitalized; yet the patient is interpreting the data in his or her sense all of the time. This affords endless opportunities to create a sense of recovery and well-being through environmental factors in which the arts, including architecture design and landscaping, have major roles to play.

This argues for the practicality (and economy) of incorporating the arts into the medical environment right from the initial facilities design meeting. Such seemingly

simple elements as lighting, wall covering and paving, for example, may have as much aesthetic impact as sculpture or a fountain.

Florence Nightingale, in her 1859 book *Notes on Hospitals*, (cited in Rosemary 2004), said that the first requirement of a hospital is that it should do the sick no harm. She included guidance on issues such as sanitary conditions, principles of construction and the impact of the building on patient care.

Beginning in the 1960s, designers began to believe that, 'If a man can manipulate his surroundings to improve his physical well-being ... he can manipulate it to foster desired behaviour and to eliminate negative responses' (Chaney, 1973, p.61). This concept plays a large role in the design of hospital facilities. Under normal circumstances, when people feel uncomfortable with their physical environment outside a healthcare facility, they can solve the problem by simply leaving or adapting to the environment (Malkin, 1992).

Unfortunately, this is not the case in healthcare facilities because individuals cannot simply leave if they need to get well. Patients are forced to adapt to such environments and this has negative effects on their recovery. Verderber (1983) and Ulrich (1984) both conducted research on the effects of windows on hospital patients' well-being. Verderber (1983) found that a patient's proximity to a window and view context out of the window had a positive effect on their well-being.

It is apparent from the literature that certain areas within care settings are not designed in a way that provides healing surroundings.

Roslyn Lindheim (1983) a critic of the modern hospital facility says:

"The adjectives used to describe hospitals include: dehumanizing, depersonalizing, neutering, frightening, uncaring. I have neither heard anyone describe a hospital as beautiful, peaceful, healing, warm, joyous ... indeed, a look at the modern hospital speaks not of human healing but of our technological progress, not of caring but of an increase in the GNP (Gross National Product), not of generating health but of saving jobs and institutions" (Verderber, 1983, p.17).

Despite this, the belief in hospitals is strong today. Roslyn Lindheim (1983) concludes that, hospitals should then provide what their customers require, which is a secure and

comfortable physical environment. Verderber (1983) adds that this requirement for better facilities places an incredibly huge responsibility on designers.

2.3.3 Environmental Behaviour Theory

The dissection covers the theoretical frameworks in relation to user satisfaction and behaviour and how the user perceives their surroundings. The component frameworks are defined and discussed in the next section.

2.3.4 Environment Dimensions

Bitner's framework (1992) divided the physical dimensions into three categories: ambient conditions, interior conditions, and architecture.

Ambient condition: refers to characteristics of the interior environment which affects human five senses (Lovelock and Wirtz, 2007). Single occupancy interior elements should be compatible to create a preferred environment to enhance user satisfaction and well-being.

The ambient category: includes music, smells, and scents. All these categories could create a positive response. However, within this category it is not the aim of the researcher to examine anything except music, which will be identified during the data collection.

Interior design conditions: layout and functionality is related to equipment and arrangement, the size and the shape of furniture and style of décor (Bitner, 1992). Functionality refers to the use of the equipment (Zeithaml et al., 2006).

The hospital room designer should consider factors conducive to creating a positive environment. In the light of the above and in the sense of design and healthcare research the purpose of this thesis is to provide guidelines for the hospital designer to assist them in thinking of new ways to design single occupancy rooms for patients. This research identifies people's perspectives on hospital rooms in the interior design category, in order to help the designer in better understanding what the client needs. With regard to the importance of interior design Webster and Johnson; (1999) states:

“Designers have to consider what is important for patient and supportive for their satisfaction, and the difference in their culture context. The understanding of these issues is essential as a foundation for design planning” (Webster and Johnson, 1999, p.88)

Architecture condition: refers to characteristics of the architecture such as Single occupancy size, and door and window location. These are permanent elements which cannot be changed, and will not be examined in this study.

Next is a discussion of the components of the physical setting.

2.3.5 The Physical Environment and Human Behaviour

2.3.5.1 The Physical Environment

The physical environment is the setting which encompasses hospital room, and room setting for patient. “The physical environment is the world we live in, and work in” (Beyer and Holtzblatt, 1998, p.116).

Physical environment has the characteristic which may improve people’s well-being. In the modern setting it is a fact that people spend most of their time indoors or inside artificial environments. The healthcare environment and the way it is presented may send to its user either negative or positive responses and it may please or disturb our feeling and mood. In the light of that, Dilani (2001) wrote,

“The physical environment affects our behaviour; well-designed and positively experienced environments enhance the ability to cope with stress. We react constructively and find ways to resolve problems if we have a good experience of our surrounding” (Dilani, 2001, p.35).

Human behaviours are influenced by physical settings (Bitner, 1992). The perception of the physical environment of a hospital room leads to emotions, and physiological responses which affect individual behaviour (Mika, 2008). Individual behaviours are a result of internal responses to the hospital room setting. Internal responses can be divided into emotional, cognitive, and physiological responses (Mika, 2008). Each individual is a little different from every other individual, which makes it even more challenging for the healthcare provider and the designer to fill the gap of knowledge which consists in understanding human responses to the environment. The physical

environment design features, which enhance our well-being have been considered important features since the Roman Empire era.

Mazuch (2005) went on to outline these characteristics as natural light and artificial light, colour, views, artwork, aroma, modulation of space and form, arrangement of furniture, manipulation of scale and proportion, sound, texture and materials, movement through space and time, indoor and outdoor plantscapes.

The significance of the physical environmental design aspects that affect and influence our lives has been documented since the Roman ages. The Roman architect Vitruvius, writing in the first century BC, indicated that all architecture should consider the following points for all public buildings:

1. Durability should be assured when foundations are carried down to the solid ground and materials are wisely and liberally selected.
2. Convenience when arranging of the apartments is faultless, and this should be done as to prevent any hindrance to its users.
3. Beauty is important so that the appearance of the work is pleasing and in good state. Cited in (Hosking and Haggard, 1999).

Recently, the idea of improving the healthcare setting to promote healing and well-being is accepted by the healthcare profession. The physical health care setting and hospital room design has recently come a long way in a short time. A number of Healthcare professional journals and designer journals have been published.

Alvarez (2004) states that there is one universal truth about hospitals, that is the fact that they are drab, dismal places, which are not really designed for the patient to heal. He goes on to say the furniture is hard-edged and bland, lights are artificial and harsh, and it is not pleasant place (Alvarez, 2004).

Bitner's theoretical framework (1992) emphasises that interior elements influence user behaviour. Individuals may respond to the physical environment with either a satisfaction approach or avoidance behaviour (Binter, 1992). Approach behaviour involves positive response to the environment. In single occupancy study, user may respond positively to wall colour, artwork, and lighting, and that may make them feel happier being in such well-designed single occupancy, opposite responses are referred

to avoidance behaviour, triggered by the user's desire not to stay in unpleasant room settings. This may lead the user to avoid hospitalization if dissatisfied with the quality of the surroundings.

According to Monze and Monze (2001) what a patient needs are not merely physical attention, consultation, medicine and physical therapy. A human soul also needs company and familiarity. All of this could be achieved by designing a "public preferred" room.

Wells-Thorpe (2001), states that there is no hope of designing a good attractive hospital space. He further states that there is no hope the subject will be taken seriously and its findings implemented. Yet, patients need more than just physical attention, medicine, or physical therapy.

Bitner (1992) indicated that the internal response leads to approach behaviours and positive internal response leads to approach (satisfaction) behaviours (Bitner, 1992).

There is strong evidence that hospital room design changes will make the environment more comfortable, aesthetically pleasing, and actually may increase people satisfaction with room design. Making changes to the general room layout, colour scheme, floor, furniture, and curtains, and providing information displays resulted in more positive environment appraisals, improved the mood of the patients and altered their physiological state in beneficial ways (Leather et al; 2003 cited in Ulrich al., 2004).

The interior design of patient single occupancy rooms is critically important for their satisfaction. We know the feeling of walking into a room that has good design features: we immediately feel good. Yet, in that sense, visual attention to the design detail could generate a feeling of confidence about the healthcare provider and a professional look (Milkin, 2002).

Harris et al. (2002) and Bitner (1992) identify the following dimensions as forming the physical healthcare environment; architectural features, interior features and ambient features. The architectural features are relatively permanent characteristics such as, the

layout of the hospital, design configuration, room size, window placement and access to views, and outdoor areas (Ulrich, 1999; Dijkstra, 2006).

Interior features are defined as less permanent elements, such as colour, furnishings, artwork, light, texture, aesthetic quality of the room (Dijkstra, 2006). Identifying this category is the aim of the researcher. Dijkstra (2006) says that windows are important in association with pleasantness and interior features on a building. He describes ambient features as consisting of lighting, noise levels, odours and temperature.

According to Bitner (1992) internal response may elicit emotional responses, which could influence an individual's behaviour. Emotional response is divided into two dimensions, pleasure and arousal. There are positive behaviours normally arising from pleasure and arousal (Mika, 2008). Pleasure can be achieved by aesthetically pleasing surroundings. Hospital design and décor professionals and all healthcare providers require conditions that promote patient healing and satisfaction by providing designs which lead to positive internal responses. Those experiences that create displeasure are viewed negatively and those that create pleasure are viewed positively. For example patients may have a positive emotional response to colour (Fottler et al., 2000).

Fottler et al. (2000) points out that the setting of a hospital room can be an important part of the healing experience. For example, a Swedish architect who designed a unique healing centre in Sweden, became convinced that the experience of interior architecture could be an important part of the healing process. They went on to assert that the quality of the healing environment must be managed carefully to ensure that the patient is satisfied with the care provided.

The way in which a room is designed or laid out, the colours of the walls and the settings may also enhance a patient's feelings of comfort and security (Fottler et al., 2000).

Safety and security are important to minimize patients' exposure, helplessness and vulnerability by ensuring security of patients and their personal possessions through specification of appropriate finishes, materials and equipment.

The interior dimensions Bitner refers to in his framework (1992) which influence user's behaviours are discussed in the next section.

2.3.5.2 Human Behaviour within the Environment

The physical environment does not, in itself, cause the user to behave in certain ways as a result of being in that environment (Mika, 2008). The perceptions of the physical environment lead to specific emotions, beliefs, and physiological responses which in turn affect behaviours (Mika, 2008). The internal responses are divided into physiological, cognitive, and emotional responses. These responses are explained subsequently in relation to each interior element

Environmental psychologists suggest that people react to places with two forms of behaviour: approaches (stay longer in the environment) or avoidance (leave the environment). The user would rather leave if the interior design of hospital is poorly designed (Mehrabian and Russel, 1974).

Bitner (1992) assumption is that positive responses may lead to approach behaviour (satisfaction) and on the other hand negative response leads to place avoidance (Bitner, 1992). For example if a patient comes to a hospital with the purpose of healing and then is hospitalized where he can't sleep because the bed is uncomfortable or the furniture of that room is unsuitable then this condition may have an effect on that user and that may lead to a negative emotional response.

The avoidance behaviour of users are determined by individual internal responses (emotional, cognitive, and physiological) to hospital room behaviour (Bitner, 1992). Internal responses are discussed in detail subsequently.

Positive (negative) internal response leads to approach (avoidance) behaviours (Bitner, 1992). For hospital room user approach responses such as affiliation, satisfaction, stays longer, will service the purpose of being in a hospital room. Avoidance will have the opposite effect which in the case of hospital rooms is the desire to leave (Bitner, 1992).

Healthcare designers face a big challenge in designing hospital rooms, which enhance user satisfaction. One challenge is to design an environment (Hospital room) to enhance individual approach behaviour and encourage satisfaction (Bitner, 1992). Environmental psychology research strongly suggests that the physical environment can influence behaviours in several ways (Bitner, 1992); therefore the first plan in the

purposeful design of (hospital room) is to identify the most desirable setting (Binter, 1992).

For example, in designing a hospital room, the first task is to identify the goals of the hospital room and what the hospital wants to achieve. Hospital goals are always to please their customers and enhance well-being during hospitalization. The user's behaviour is associated with healing, therefore the healthcare designer should propose designs which would be conducive to healing and ultimately support the goals of the hospital (Bitner, 1992).

This research is designed to identify single occupancy interior design and décor features preferred by the general public. Once this question is answered then Bitner's question will be answered. This is to arrive at a description of preferred interior design elements and what constitutes user comfort.

2.4 *Interior Conditions of the Physical Environment*

2.4.1 *Environmental Aesthetics*

There is a consensus among researchers that the aesthetics of healthcare environments are important to patients' feelings of well-being (Ulrich, 1983, 1991; 2001; Fottler, 2000; Moore, 2000; Mazuch, 2003; Nasar, 1988, 1994; Palmer and Nash, 1997; Biley, 1996; Dijkatra, 2006, 2008). The argument is that, creating aesthetically pleasing environments can enhance the healing process and improve patients' well-being.

Light, colour, artwork and furnishing are the major dimensions of the environmental aesthetics. These four aesthetic components were identified as being important to patients and have the capacity to provide messages of support and welcome. Designers have recognized that the interior features provide intrinsic values, such as aesthetic qualities, which contribute to a good quality of place and environment. Ulrich (1983) revealed that aesthetics and emotional/affective experiences are the most important benefits in the environment.

Designers should understand human interaction with the environment. Research has found that the aesthetics factor has a major influence on judgments of our surroundings. Aesthetic variables were rated the highest amongst variables in the quality of residential environments (Zawadski and Shokron, 1976, cited Nasar, 1997). Based on the evolutionary perspective (Ulrich, 1993; Nasar, 1997), human beings had to evaluate features of their surroundings that might benefit or threaten their well-being.

2.4.1.1 Perception and Aesthetics

Interior designers should understand fully the concepts of beauty and aesthetics. Aesthetic values could be understood at a universal level (Edward, 1992). Those design concepts go beyond the functionality of the space, and it is associated with the specific technique to connect with the human senses (Hall, 1992). When the occupier of the space looks at the interior objects the physical appearance of that environment causes a sensory experience which in turn affects their behaviour (Edward, 1992). An interior designer's awareness of the concepts of the beauty and aesthetics will help him to communicate his plan to its user.

The designer should take account of individual differences by consulting a range of occupants of the environment as to their likes and dislikes within their environment.

Light, colour, artwork and furnishing are the major dimensions of environmental aesthetics. These four aesthetic components were identified as being important to patients and have the capacity to provide messages of support and welcome.

Colour is an important factor in the perception of an environment's aesthetics (Edward, 1992). Colour can positively influence mood and behaviour and psychological and emotional effects can be achieved through the use of colour.

Colour choice is an integral part of any room design, whether wall colour, installing floor coverings, furniture choice, or selecting of art work and plants. Here are some general ideas about the use of colour and its influence on the environment

- Light colours make a hospital room appear larger than it actually is, while dark colour makes the room to appear smaller.
- Warm colours make the room feel warm, while others may make it seem cold.
- Certain colours have a definite effect on the mood of the room occupier some colours are stimulating, others are relaxing (Edward, 1992).

2.4.1.2 Individual Physiological Responses to the Physical Environment

Fottler et al. (2000), indicates these are the body's reaction to external stimuli (e.g. cold or heat), and includes the mind's limitation in processing information. People may react purely physiologically to environmental qualities such as air quality, sound, and temperature that may cause discomfort (Mika, 2008).

Individual physical response may affect how long users stay in hospital rooms. In this research a public's preference for a particular hospital will be impacted by their physiological responses. There are some designs which may elicit a certain physiological response to the patient's body which would lead their preference of the facilities. During the planning phase, there are several factors an interior designer should consider in relation to physiological responses. These include functionality, and ergonomics (Edward, 1990).

2.4.2 Light in Healthcare Environment

The effective use of light is an essential component of hospital design. Light should be used creatively both within and outside the building in order to light the building and create a sense of presence and beauty.

The effect of light on health is critical. Mazuch (2003) says that long ago, hospitals had large windows which allowed natural light to fill the room space. He goes on to say that beds were pushed out onto balconies and terraces. Solariums were used as healing environments. Essentially, people crave for light. Light is life. With little or no natural light, melatonin tells the body to 'log off' and even causes illnesses such as SAD (Seasonal Affective Disorder) (Mazuch, 2003).

Today, with more understanding of the effects of natural light (sunlight), researchers are now focusing on the effects of artificial light to life. They seek to find its effects on life rather than only as an aid for vision. Research that was carried out indicates that constant exposure to ordinary artificial light has biological implications. Sunlight maintains a balanced light which is essential for the growth and health of living things, including man.

Natural light should be provided in hospital rooms, including staff spaces within the building as far as is practical. Studies conducted (Carpman et al., 1993) show that natural light is an essential element to facilitate healing. The use of both natural daylight and artificial light should contribute towards a high quality healing environment.

Light is an important aspect of the healing environment and has a tremendous influence on the colour of physical surroundings and people in a healthcare setting. It should be possible to adjust lighting, for example, for reading, to suit the mood and condition of the patient.

Natural and artificial light sources should be designed to avoid glare and thermal gain (Carpman et al., 1993). The hospital environment should be well lit and abrupt changes in illumination should be avoided, unless specified as a clinical treatment requirement.

The design of window glazing should be such that, whether on a bright or overcast day, the provision of natural light within the hospital is maximised to light the interior to the appropriate standard specified while maintaining comfortable light and thermal conditions for the users. Artificial lighting layouts particularly, but not exclusively, should be designed to avoid the creation of a stroboscopic lighting effect.

H.L. Logan, a leading lighting engineer, has gathered data on the effects of light on human beings. Quoting from his experience and the research of others, Logan points out that light dilates the blood vessels and increases circulation, thus ridding the body of toxins and lightening the load on the kidneys. Haemoglobin in the blood will be increased by light and decreased by darkness (Faber, 1969).

Light also has aesthetic effects because it changes the way hospital rooms look. The quality of the visual environment has a positive effect on the occupants' feeling of well-being, and in the case of hospital and healthcare buildings this may affect staff performance and patient recovery (Dalke et al., 2003).

After looking at the effects of light on the healthcare environment, we should bear in mind that each person has their own personal lighting preferences. And these lighting

preferences are what the research is going to identify and present to the necessary planners for future reference.

2.4.3 Art in Healthcare Environment

The use of art in hospitals began in England as early as 1960, that is when hospitals hung art on the walls as an art gallery. The founder of the Society of Arts in Healthcare believed that pictures hanging in a long sterile hallway or a sculpture displayed in a bare lobby, transformed the hospital into a healing environment for patients. The idea was significant because it created awareness that a hospital is an appropriate environment for art, an environment where beauty and healing were connected (Lane, 2006). Lane (2006; cited Fletcher, 2002 p.78) concerning the effects of art in hospitals. He said:

“One heart transplant patient, for example, on visiting the gallery in a hospital set up near his waiting area, said that he could step away for a moment, as he was enjoying the beauty of nature”.

Art improves the quality of a hospital room; therefore, designers must choose art that edifies the patient's well-being. High quality art in healthcare pulls a person's attention to the art and creates a positive distraction. Beautiful art is calming and uplifting. Within the United Kingdom (UK), research conducted in Liverpool hospital about the effects of art showed that the use of art in patients' rooms made them feel better (Cintra, 2001).

A study was done on the effects of art on healing by Sarajane et al. (2008). It was intended to find out how children responded to art as a stress reduction tool. The study indicated the importance of art and its effects on the psychological and physiological well-being of children in hospital.

They wrote, “Art in healthcare settings is extremely important in contributing to the health process”.

Sarajane et al. (2008) believed that art potentially possesses therapeutic benefits. They also indicated how important it is to understand what type of art patients prefer and what contributes to healing. The use of painting on the walls allows the individual's preferred art to be easily available. This research will potentially identify public art

preference which can be used in Hospital single occupancy rooms. Individual emotional responses to art are discussed next.

2.4.3.1 Individual Emotional Responses

According to Bitner (1992) internal responses may elicit emotional responses, which could influence an individual's behaviour. Emotional responses are divided into two dimensions, pleasure and arousal.

Positive behaviour is normally created through pleasure and arousal (Mika, 2008).

Pleasure can be achieved by an aesthetically pleasing surrounding. A display of art in hospital room would lead to pleasure.

Arousal could be created through complexity, such as using a poor room interior design. Hospital design and décor professionals and all healthcare providers require conditions that promote patient healing and satisfaction. Those experiences that create displeasure are viewed negatively and those that create pleasure are viewed positively.

For example patients may have a positive emotional response to music or art (Fottler et al., 2000). Will a patient's emotional response, like associating past emotional distress in hospital, affect their choice of design? This would mean patient preference is significantly affected by some emotional factors associated with the hospital and not direct personal preference. Also if personnel of a certain hospital were very nice and caring, the research presumes this would also mean for them that past hospital's design will be preferred and vice versa.

2.4.4 Colour in the Healthcare Environment

An interest in the phenomenon of colour has continued throughout the twentieth century, and the use of colour for health, architecture and commercial purposes is gaining momentum. As cultures diversify, interest in the subject of colour is deepening and its applications becoming broader. In support of colour as a healing tool, Gage (1999) says colour is more than simply a design tool; it contains values in its own right.

Kenneth Edwards (1979) says if people are affected by colour in their normal lives, then they are even more susceptible to the effects of colour when they are not feeling their

best. Thus, an appropriate colour scheme may aid in a patient's recovery (Cited in Carpman, 1993).

During the 20th century colour in hospitals created a dull monotonous environment of white. White dominated the interior walls, ceilings, furniture, and linens. The combination of white walls, white sheets, white hospital scrubs and artificial lighting created glare. Nurses and physicians were blinded by the glare when they looked away from the open cut wound during operations (Birren, 1979).

Then healthcare environment used hospital green as the dominant colour. The green colour was used in operating rooms after the rooms moved from the top floors with skylights and artificial lighting to interior rooms with only artificial lighting. The hospital green was recommended for helping reduce the afterimage effect on operating personnel (Wise and Wise, 1987).

Dutro (2007) says, the hospital green worked very well for hospitals. Then healthcare began to paint the entire facility with the colour green assuming that other tasks would be aided by its presence. As different finishes were introduced throughout the hospital, all walls were painted hospital green. Hospital green walls combined with the hospital green scrubs created their own monotonous surroundings.

This was because the hospitals were built for the doctors, nurses and other workers within the hospital environment. The patients who needed their services were not considered whatsoever in such settings (Dutro, 2007).

Researchers from the University of Washington reviewed the literature to determine what is empirically known about human responses to colour. They found that the use of hospital green to minimize the after-effects on the operating room staff was a myth (Wise and Wise, 1987).

Interior designers today introduce other colours in the finishes of the hospital environment. Studies undertaken on colour encourage the belief that colour has more than an aesthetic role to play in the successful design of our environment, but there remain many unanswered questions (Varni et al., 2001).

Wells-Thorp (2001), a well-known British architect, states that studies must be made to shift the argument from fashion and aesthetics into a discipline with valid measurable results confirming the effect the built environment has on a patient's outcome. Only then will the subject be taken seriously and the findings utilized.

According to Pierman (1976), a workshop 'Colour in the Health Care Environment', was held at Maryland and professionals such as architects, engineers, designers, builders and representatives of financial institutions attended

Pierman (1976) states that Marcella Graham, an environmental design consultant at the workshop, believed that human response to colour falls within six categories as shown below.

<i>Human Response to Colour</i>	
Cognitive	Memory and recall illusion and perceptive confusion, values, judgment, associative response.
Mood	Stimulating, irritating, cheerful, relaxing, boring, exciting, and melancholy.
Impressionistic	Space seems larger, smaller, warmer, cooler, cleaner or dirtier, brighter or drabber; people appear healthier or unhealthier.
Physiological	Change in blood pressure, pulse rate, automatic nervous system, hormonal activity, rate of tissue oxidation and growth.
Within the eye	Change of size of pupil, shape of lens, position of eyeball, chemical response of retinal nerve ending.
Associative	With nature, with technology, religious and cultural traditions, with art and science.

Table 1: Human Response to Colour: Source; Pirman (1967)

Looking at the categories outlined above in relation to colour, one can say that colour potentially possesses therapeutic benefits and it is important to understand what type of colour people prefer. Without findings based on sound research, the designer has no guidelines to create, “patient preferred” designs. Birren (1979) suggests using colour in hospital as follows:

- Warm colours for convalescing patients on the way to recovery and maternity patients in need of physical relaxation
- Cool colours should be used for long-term patients and those in need of long periods of rest time
- Cool colours and low lighting should dominate emergency rooms where patients wait for examinations or tests
- Waiting rooms where families wait with anxiety need cool colours to help foster a calming effect
- Colours containing yellow-greens should be avoided because reflections from these colours cause the skin to look sallow and unhealthy with an uncomplimentary purple afterimage (Birren, 1979).

The reasons for the various responses to different colours are a result of how people recognize colour. Torrice (1989) explains that colour is received into the body through the eye gate bouncing off the back of the eye sending impulses to the brain. The brain translates the signals into colours.

When the brain translates signals into colour, it has a physiological impact.

Olds and Daniel (1987) agree by saying that “Colour influences the nervous system, respiration, blood pressure, muscle tension, eye blinks, cortical activity and other body functions. Mazuch (2003) gives an example saying that a patient receiving chemotherapy will feel sicker if receiving treatment in a green room, yet apple green can relieve depression. The author also claims that certain reds can induce epileptic fits. Colour can be used to create illusions in the built environment and it gives an aesthetic feeling. Warm colours bring the object closer to the eye. Cool colours recede. Whites and yellows leap forward ahead of other colours. Tall ceilings can be lowered with warm tones. Long hallways can be shortened to the eye with warm colours at the end. Rooms can become more spacious with cool, muted colours.

This notion is supported by Mazuch and Stephen (2005) by saying colour can enhance light by brightening or subduing spaces, provide sensory stimulation, give directional and other information, and optically change the proportions of a room.

Colour and light in healthcare facilities should not only fulfil architectural or aesthetic criteria, but should have overall regard for specific user requirements (Oberascher, 2001). This is where this research fills a gap. It aims to identify public requirements for hospital single occupancy rooms. The findings will be useful to hospital designers and planners.

Colour is an important variable in interior design because it is a relatively easy way to alter the atmosphere of an environment. A more pleasant atmosphere may have a beneficial effect on patients (i.e. a healing environment). Changing the wall colours in existing environments is also fairly easy and inexpensive, making it an interesting variable for healthcare organisations to generate such a favourable effect.

Although wall colour is an environmental stimulus that can be easily changed and might fairly easily alter the atmosphere of an environment, the literature reviewed cites empirical evidence which show a weak attention to environmental colouring in healthcare settings.

No matter how inexpensive colour, as a healing tool is, without the right knowledge designers will not be able to create the appropriate healthcare healing environment.

Acknowledging that a problem exists with the use of colour in built healthcare environment is the first step in the equation. The next step is to re-think the ways we use the colour to create healing healthcare environments. Colour experience and Individual Cognitive responses are discussed subsequently.

2.4.4.1 Individual Cognitive Response

Cognitive response refers to a person's expectation of the environment based on the prior experiences of people and non-verbal communication evoked by physical cues in the environment.

Fottler et al. (2000) states that the tendency of people is to seek a point of similarity between what we have seen or experienced in our life and the hospital environment.

Cognition is the mental processing of sensory information (Mika, 2008). The more

familiar a hospital room can make the experience feel, the less confusion and unhappiness a patient will experience (Fottler et al., 2000).

In this study the respondent's cognitive association with either past healing or their own home design will affect their preferences. For instance if in the past the patient got healed quickly in a blue painted room where a painting was hanging, they would associated the past event with healing and thus indicate blue painted room with some art as their preferred design and décor.

2.4.5 View of Nature

A window is one of the important interior elements in single occupancy. It's considered important for room users. Verderber (1986) suggests patients prefer rooms with windows, but only if they have interesting views, preferably a view of nature. Ulrich (1984) suggests that a hospital room with a view of nature might reduce recovery time and provide relaxation. Ulrich (1981) also conducted laboratory research which found that views of nature produce higher levels of relaxation. In a study about window views, Verderber and Reuman (1997) concluded that window views help the occupiers develop a "perceptual and cognitive link with external environment" which may positively affect the therapeutic process and may increase satisfaction with the environment (cited in Devlin et al., 2003).

Kaplan et al. (1972) suggest scenes of nature exert a positive influence and lower stress more effectively than do scenes of the urban environment. A window also allows natural light into the room. In a study, Heerwagen and Heerwagen (1986) examine preferences of daylight to and electric light in an office setting and found that workers in that office preferred daylight over electric light.

2.4.6 Advantages of Single Occupancy and Human Behaviour

Environmental researchers argue that the physical setting may influence the user's satisfaction with the environment (Bitner, 1990; Harrell, Hutt and James Anderson 1980).

This section discusses the relationship between single occupancy occupiers and their interior settings. It also explains how people perceive their surroundings. Perception of

the environment is affected by sociological needs, psychological state, and individual differences (Edward, 1990). The single occupancy interior itself also affects and influences human behaviour. The state of both mental and physical stimuli affect behavioural responses to the environment (Edward, 1990).

Bitner's conceptual framework (1992) addresses the subject of planning and designing an environment which will lead to achieving satisfaction and may enhance the user's well-being. This framework is rich for addressing such ideas and for exploring the role of the physical setting in hospital rooms. This framework suggests that the user perceives the environment in three ways: cognitively, emotionally and physiologically (Bitner, 1992).

Theoretical discussion is presented that addresses some subjects which affect the individual in single occupancy. The significant factors that affect individual behaviour in single occupancy are discussed in the next section. These factors are: sociological human need, perception/ aesthetic and human response to the interior environment.

2.4.7 Human Need in Single Occupancy

The individual's perception of their environment influences their social interaction within that environment. Individual social interaction within single occupancy can be discussed in terms of three fundamental concepts: individual privacy, personal interaction, and territoriality (Hall, 1990).

2.4.7.1 Individual Privacy in Hospital Room

Privacy in single occupancy is identified as a central directing human process by which people make themselves more or less accessible to others (Hall, 1990). Single occupancy rooms will enhance privacy in hospital. For hospital twin rooms privacy could be handled through using a half screen between the beds, and that may protect individuals from unwanted physical and visual contact with other.

The healthcare service provider should plan and enhance the use of single occupancy in hospital, which in return will enhance individual privacy levels in hospital rooms. As discussed in chapter one Edward T. Hall (1990) defines three distinct distances at which interpersonal transactions normally take place. In designing hospital rooms, it is

important that interior designers understand those categories, and then apply the Ergonomic rules to hospital room design. Each aspect of single occupancy plan, which includes Furnishing the space, needs to be carefully assessed in term of its compatibility with the human body (Edward, 1990).

2.4.7.2 User's Individual Territoriality

It involves the exclusive control of a space by an individual (Edward, 1990). In this study an individual may consider their room as their territory and make the place personal, and consider personalization of the space. Users personalize their spaces for expressing emotional ties with their existing environment (Lily, 2010).

2.4.8 Creating Supportive Single Occupancy

Interior designers only have their own view for problem solving in designing hospital rooms, without fixed solution bias. Whereas, for example if you need an architect's help, then some building activity will take place to sort out the problem, and if you have a legal issue, then a lawyer will take action within a frame work.

An environmental designer researches and examines the problem without fixed solution bias, welcoming diversity and client or design complexity, and offers the potential of interdisciplinary results (Hesham, 2006).

In the light with this, consultation and co-present collaboration method was used in this study along with thematic analysis processes used in this research that have established a research method and design tool required. See chapter three for more detail.

That technique allowed the interior designer to generate interdisciplinary and strategy awareness that will enable Health Care professional and interior designer to deal with design problems in hospital rooms and medical environments.

The result of single occupancy design (see chapter four) demonstrated that the technique used for identifying "people preferred" interior and décor was successful.

In support of these design concepts there are two significant facts:

- First, facilities cannot be designed if the functions to be housed are not known (John, 1994). My study is about understanding user needs and requirements in hospital rooms.
- Second, it is the job of designers to listen carefully and uncover the meaning of the information they hear (Hosking and Haggard, 1999).

The existing methods of identifying user requirements must be modified and the process of analysing the data collected from the user should be developed and improved.

2.5 Design Factors

2.5.1 Interior Design

By a mere look at single occupancy rooms one would say designers rely only on their experience or instinct to create healthcare environments. Many designers are not aware of the importance of designing healing environments. Designers have little guidance, based on sound research, to use in creating healing environments.

Durto (2007) supports this view saying, many interior designers design hospital facilities with a near total ignorance of the role the built environment plays in the health outcome of users of those facilities. However, designers create spaces using their only available tools, their intuition, personal preferences, and the current architectural fashion.

Hospital designers need to focus on making every design decision benefit the user to enable the success of the healthcare facility. They need research based answers to the healthcare environment design question, “*What are the interior design and décor features preferred by the general public in hospital with special focus on single occupancy rooms*”?

This research identifies the preferred design and décor; these findings will help interior designers in rethinking the design of the healthcare environment.

In relation to these healthcare designs Chaney, writing in (1973), says designers face a great challenge in designing a positive hospital interior environment. Users are entering a hospital setting, already suffering from some ailment, therefore it is extremely

important that the design has a positively pleasing impact on the user's psychological state and contributes to their satisfaction, or at least does not exacerbate their illness.

2.5.2 The difficulty of Designing Interior Space

Designing interior space is a complex activity. Rengel (2003, p.5) discusses the nature of interior design. He says, "Designing good interior spaces is difficult". The number of design problems, and their complexity can be staggering. These alone make interior design one of the most difficult fields in design.

Designers are required to do the following tasks: make sense of the realities and given needs of a client; translate them into collections of spaces subdivided in special ways in response to their optimal relationships; shape and finish the enclosing surfaces of those spaces; select and design furnishings, accessories and fixtures that match and reinforce the particular style used; and make all work together and look good. Ultimately full synthesis is the goal of every project. All the parts and pieces need to work together, but still remain flexible to accommodate change over time (Rengel, 2003).

Many designers are not aware of the importance of designing healing environments. Designers have little guidance, based on sound research, to use in creating healing environments.

Dutro (2007) supports this view saying, many interior designers design hospital facilities with a near total ignorance of the role the built environment plays in the outcome of the health of the patient. However, designers create spaces using their only available tools, their intuition, personal preferences and the current architectural fashion.

In relation to these healthcare designs Chaney (1973) wrote that designers face a great challenge in designing a positive hospital interior environment. Patients are entering a hospital setting, already suffering from some ailment, therefore it is extremely important that the design positively impacts on the patients' psychological state and contributes to their recovery, or at least does not exacerbate their illness.

The interior design of the healthcare environment is critically important to the user. According to Malkin (2002) judgment is made based on interactions with the staff and evaluation of the interior design. She goes on to say that, visible attention to interior

detail in environmental design generates feelings of confidence about the healthcare professions and provider (Milken, 2002). During the planning phase, interior designers of hospital rooms should consider several factors relating to physiological responses including functionality, and ergonomics (Edward, 1990).

2.5.2.1 Functionality in Design

This relates to the user's physiological needs which are supported during the interior space plan (Edward, 1992). These needs relate to human body requirements in the occupied space.

Interior environments must respond to all human functional needs to achieve both comfort and satisfaction (Edward, 1992). The user's satisfaction with the interior space is dependent on the type of furniture, material, equipment and finishes. Wall colour will play a significant role in enhancing user satisfaction in hospital rooms.

Edward (1992) indicates that all physiological needs affect how an individual perceives and reacts toward interior space. When individual needs are appropriately met, the hospital room user will perceive the environment as successful and in satisfactory form (Edward, 1992).

2.5.2.2 Ergonomic in Design

Ergonomics recognizes that interior design significantly influences and impacts on an individual's behaviour (Edward, 1992). Each aspect of hospital room design, which includes furnishing the space needs to be carefully assessed in term of its compatibility with human body. The challenge is to plan for the hospital room user activities, furnishings, and finishes that are appropriate for the occupier.

Ergonomics uses anthropometrics for example the size of the user's bed. This data is used by the designer to create interior designs which are both humanistic and functional in nature (Edward, 1992).

2.5.3 Interior Design Effects on Occupier

In recent years, researchers started to focus on the effects of environment on healing. When patients feel depressed their body works overtime producing cortisol that

increases blood pressure, and increases the sugar levels in the body that will affect the healing process, and recovery time (Stouffer, 2001).

Instead of aiding in recovery, hospital rooms can have a negative effect on hospitalized patients and contribute to stress. With regard to stress Ulrich (1996) rightly points out that physical environments have characteristics that can influence stress levels. Stress is an important concept in understanding the interaction between individuals and the environment.

Hospital rooms have a direct effect on people who sleep in them. Hospital rooms can explain people's experience, wake up, be calm, motivate innovative thoughts but can also create fear and discomfort (Monze and Monze, 2001).

Interior designers around the world are searching for a way to humanize single occupancy design. Designing hospital rooms would ensure that patients will have better satisfaction and may heal quicker (Alvarez, 2004).

Ulrich (2001) points out that positive distraction in healthcare room interior design is an element that increases the level of positive feelings, reduces worrisome thoughts and reduces blood pressure. The author says research has proved that positive distractions in the visual hospital environment and access to nature, art, colour and daylight can reduce the level of drugs a patient uses and decrease the length of their stay in hospital.

Ulrich (2004) states that more efforts are required to confirm the findings from studies as well as to identify ways to improve design for hospital users and occupier. Scientific studies on the effects of the environment on medical outcomes stresses the need for research about the healing environment and what factors are perceived to have a healing effect (Shipley et al., 1995; Biley, 1996; Ulrich, 1996; Davidson et al., 1997; Ulrich et al., 2003).

The physical environment should, therefore, be designed to help promote well-being in the patient's room. The purpose of this research is to discover and identify interior elements which the public prefers that may increase public satisfaction as far as hospital single occupancy rooms are concerned.

Dijkstra writing in (2006) says, since the psychological and physiological well-being of patients in healthcare settings is extremely important in contributing to the healing process, it is vitally important to identify stimulus objects, such as interior design features, that serve as stimulus objectives when patients are exposed to them visually. Environmental stimuli act through psychological processes as a result of sensory perceptions.

If we create a guide for a healing environment, then designers can produce excellent and supportive design that has access to nature, light, and good furnishing.

The perception of the researcher currently is that patients have preferences with regard to view of nature, good facility, appropriate wall colour, and art work for their satisfaction and to aid in their healing process.

2.5.4 The Concept of Interior Design

2.5.4.1 The Interior Designer

An interior designer is a creative person who develops an idea into an object and environment for people to use or interact with. The Interior designer's task is involved with creating and modifying the interior environment, including the structure, the furnishing, and the equipment. In addition the interior designer must deal with people's personalities (Klimer, 1992).

According to Guerin D et al. (2001) interior design includes planning, designing and administering projects in interior spaces to meet the physical and aesthetic needs of people. This takes into consideration building codes, health and safety regulations, traffic patterns, floor planning, mechanical and electrical needs, interior fittings and furniture.

The designer should understand the activity that may take place in the related environment and obtain information from the user involved in the space being designed (Intille et al., 2003).

2.5.4.2 The Definition of Interior Designer

- The professional interior design is qualified by education and experience to enhance the quality of people's space

- Analyses the client's needs
- Integrates findings with knowledge of interior design
- Formulates preliminary design concepts and functions
- Develops and presents final design recommendations (Klimer, 1992).

2.6 Human Factors

2.6.1 Definition of an Appealing Interior Setting

In psychology, there is an effect known as the 'appealing setting effect'. This is explained as when an individual is brought into a setting that is more appealing than normal, their satisfaction with all that occurs in that setting inherently rises. It is hypothesized that the effect of an appealing setting can also be true of hospital rooms (Swan *et al.*, 2003).

Understanding this theory is very important, and it seems even more important to determine user satisfaction with rooms and also to move beyond the acute care setting.

2.6.2 Sensing of the Interior Environment

As human beings, we sense the interior of a room through five senses: smell, sight, hearing, touch, and taste. As we become familiar with our environment, our sense conveys all the information that we receive from the environment, whereas our brain contributes significance to the information (Hesham, 2006).

Our ears hear a range of sounds. The visual perceptions act as strong sensory items which immediately transfer that image to our brain. Both actual and mental elements tell us about features of the environment such as size and space (Hesham, 2006). Touching different items gives the user of the place a variety of sensations, for example: a yielding sofa, a warm plate, a soft surface, and so on. We sense our surrounding by touching things. Our sense of smell has the same role. We smell things such as fresh, new, dry, and leather. We also taste the environment by looking at it. All these elements lead to human comfort. Our brain processes the information to create understanding for us (Hesham, 2006).

The human brain interprets the image that we receive and organizes that information into stable format (Farbstein and Kantrowity, 1978). This leads to the satisfaction approach as Bitner; (1992) indicated in his framework. Human comfort is divided into

three categories: physical comfort, functional comfort, and psychological comfort (Vister; 2005).

2.6.3 Human Comfort and Interior Design

Human comfort within the environment has been applied to the interior design of the place. When users feel satisfied with their surroundings and have support for their activity, that is environmental comfort (Vischer; 2007). According to Vischer (2005) environmental comfort comprises three categories: Physical comfort, functional comfort, and psychological comfort, see figure 9 below.

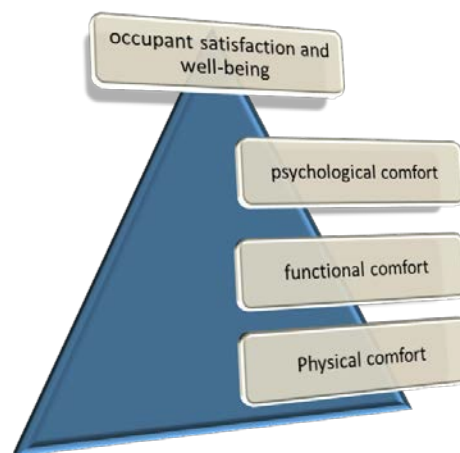


Figure 9: Environmental Comfort Model Pyramid: Source; Adapted from Vischer 2005 and Modified by the Researcher

2.6.3.1 Physical Comfort

This may include basic human needs such as hygiene and safety which can be achieved through applying the building code and standards to the building (Vischer, 2007). Light, colour, artwork and furnishing are the major dimensions of environmental aesthetics which are linked to physical comfort in hospital rooms. Designers should understand human interaction with the environment. Research has found that the aesthetics factor has a major influence on judgments of our surroundings.

2.6.3.2 Functional Comfort

Functional comfort is linked to the ergonomics of the environment and its support for place users. Ergonomics is a relationship between the design of the built environment and the users of the building or space (Kathy, 2004).

Physical comfort is important for user satisfaction; Shumaker and Reizenstein (1987) suggest that layout of furniture and equipment can influence user experience and may improve satisfaction.

2.6.3.3 Psychological Comfort

Psychological comfort results from feeling that you belong to the environment (Vischer, 2007). In this study personalization of the bed area could help people to adapt to new places, regulate social interactions, enhance satisfaction with place, and promote emotional attachment to a place. It also enhances the aesthetic look of a place and encourages creativity (Wells et al., 2007).

According to Gosling et al. (2005) people also personalize their private places to reflect their interest, abilities, personalities, lifestyle and values. As shown above, physical comfort, functional comfort, and psychological comfort are affected by the designer's choice through decision-making processes. It is important to identify user preference in relation to hospital rooms to determine the type of elements which will support the room occupier.

2.7 Summary of the Literature Reviewed

In summary, in chapter two, an overview of Healthcare design research was described. In this chapter an orientation to the knowledge bases with regard to the topic of single occupancy design was given.

This chapter dealt with six areas of literature and was informed by knowledge available around those areas which fill the gaps in current knowledge. This chapter discussed the theoretical frameworks in relation to Environmental behaviour and physical setting, individual behaviours, and internal responses with a focus on the interior design category only. The dimensions of the physical setting were also discussed.

Attention centred on user behaviour influenced by the physical setting, then on user internal responses that constitute environmental satisfaction within the hospital room. The discussion also covered the Healing environment, Human factor, Design factor and Healthcare design research that focuses on user's satisfaction with single occupancy décor and interior design and how interior elements are perceived.

The reader was introduced to the concepts of interior design, hospital design, the interior designer and single occupancy setting. Human sense and sensing the interior environment was also described. The Healing environment, single occupancy, and the advantages of single room occupancy were also explained.

The difficulty of designing interior space and the key concepts of this research's theoretical framework was given. The concepts of healing environment, the physical environment, and the interior design effects on the occupier were clarified for the reader.

The purpose of reviewing the literature was to identify the interior elements that are important for hospital user satisfaction. Environmental aesthetics: Light, colour, artwork and furnishing are the major dimensions of environmental aesthetics. These four aesthetics components were identified as being important to single occupancy users and have the capacity to provide messages of support and welcome.

The designer's tasks have been discussed. The interior features that provide intrinsic values, such as aesthetic qualities, which contribute to a good quality of place and environment was explained. Strong evidence that suggest that aesthetic issues are the most important evaluators of environmental healthcare design was also discussed.

Light in healthcare: was discussed; Research that was carried out indicates that constant exposure to ordinary artificial light has biological implications. The quality of the visual environment has been also discussed.

Art: is extremely important in contributing to the health process. The use of art in hospitals was discussed; an overview of the use of art in hospital and healthcare was explained.

Colour: throughout the twentieth century, the use of colour for health has continued to be important in architecture. The literature review indicated that Colour is more than simply a design tool; but it contains values in its own right.

View of nature: a review was carried out on the importance of a window view, which is considered important for the room user.

In the next chapter the methodology of this study and an outline of the research philosophy underpinning it described.

Next chapter covers the intended methodology and proposed study methods and why this method has been chosen for this research.

Chapter 3: Materials and Methods

3.1 Introduction

This chapter covers the intended methodology and proposed study methods and why this method has been chosen for this research. It outlines the research philosophy underpinning the thematic analysis and the interpretive approach, research design, sampling procedures, data collection and analysis approaches, and a few methodological and ethical considerations.

The issues of rigor and establishing trustworthiness, and ethics are described. This is followed by a detailed discussion of utilizing ArchiCAD software, the process of creating the design during the data collection, and the steps in preparing for the consultation session. This chapter is divided into the following sections as shown in figure 10 below.

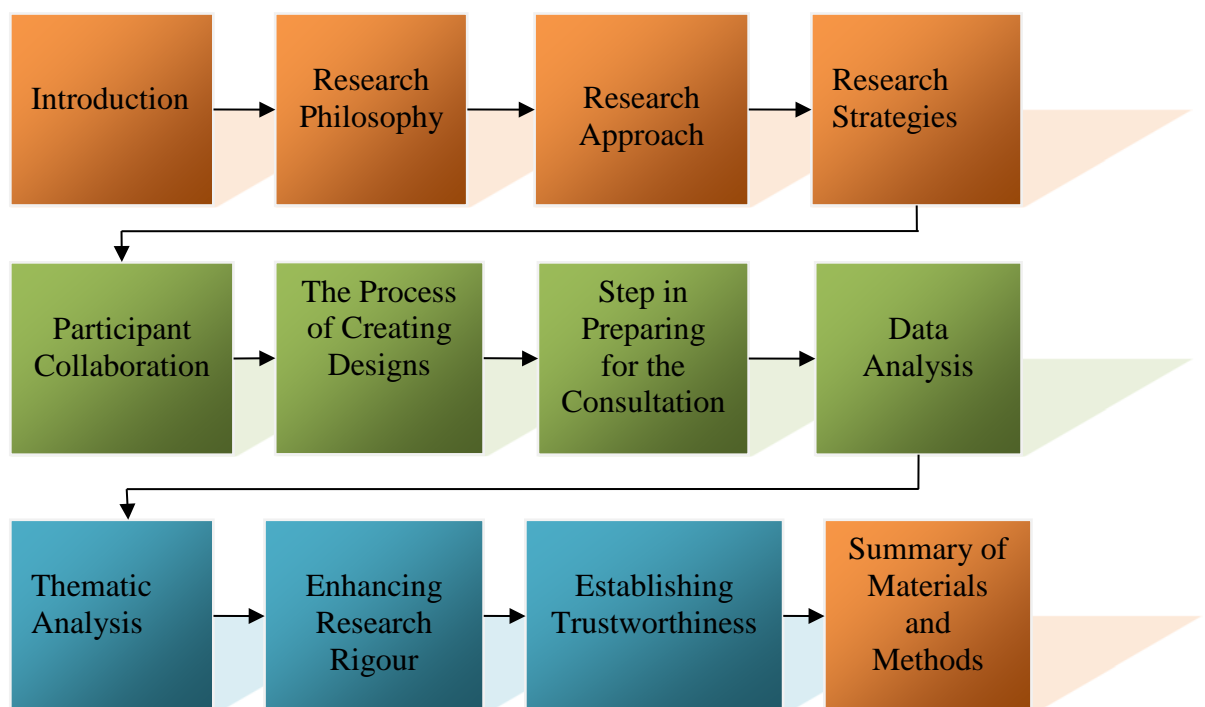


Figure 10: The Structure of the Material and Methods

3.2 Research Philosophy

There are three main research philosophies in social science research: positivism, interpretive and critical approach. The following table by Neuman et al. (2003) contrasts these research philosophies:

	Positivism	Critical Social Science	Interpretive Social Science
Reason for conducting research	To discover natural laws so that people can predict events.	To smash myths and empower people environment to change society.	To understand and describe meaningful social actions.
Nature of human beings	Self- interested and rational individuals (Analytical).	Creative adaptive people with un-realized potential (Critical inductive Theory).	Social beings who create meaning in their worlds (Constructivism).
Nature of social reality /How do we know the world	Stable pre -existing Patterns.	Conflict filled and governed by hidden structures	Fluid definitions of a situation created by human Interaction.
Ontology	Realism	Historical realism	Relativism
Good evidence /Relationship between researcher& researched.	Based on precise observation that can be repeated.	Informed by theory that unveils illusions.	Embedded in the context of fluid social interaction.
Epistemology	Objectivist	Transactional/ Subjectivist	Subjectivist
How to conduct the research methodology	Experimental, Manipulative & verification.	Dialogical/Dialectical.	Hermeneutical/Dialogical.

Table 2: Research Paradigms Source; Adapted from Neuman et al. (2003) (cited by Denzin & Lincoln 1998)

3.2.1 Positivism Research

Quantitative natural scientist researchers used this approach widely. Positivism in social sciences was used as far back as 1798 by a Frenchman called Comte who was the founder of sociology as a field of study.

Many researchers have adopted the positivist approach and it has been used to deduce hypotheses from a general theory.

For example, they may take a statement or prediction, gather data and use statistical means in order to test the theory prediction (Neuman, 2003, p. 90). Positivism considers social science as an organized method for combining deductive logic with precise empirical behaviour in order to discover and confirm a set of probabilistic causal laws that can be used to predict general patterns of human activity (Neuman 2003, p. 71). This definition is directed to the clinical observation of human behaviour which is predictable and guided by the law of cause and effect. Therefore, the positivism approach would not serve the purpose of my research study, which is to identify people's preferences with regard to single occupancy room within the context of interior design and decor.

Critical and interpretive social scientists criticize positivists for not understanding and acknowledging that real people are involved in their experiments, for ignoring the fact that people's experiences are shaped by social context and for not taking into account that people have the capacity to think and evaluate their surroundings using reason (Neuman, 2003, p. 76).

3.2.2 Critical Research

This second approach to social science research is similar to the interpretative approach to some degree, but it differs on some fundamental ways. It was introduced back in 1818 - 1883 by Karl Marx and Sigmund Freud (1856 –1939) and is associated with conflict theory (Neuman, 2003, p. 76).

Critical social scientists are action orientated. They aim to change the environment and the world by exposing discrimination and inequity. Critical research is defined by Neuman as a critical process of inquiry that goes beyond the surface illusions to uncover the real structure in the material world in order to help people change their conditions, and build a better world for themselves (Neuman, 2003, p. 81). The critical social science approach is used by communities and organizations to question social structures uncover underlying social dynamics and propose transformation. This

approach uses mainly observation and is concerned with researching inequality in the social world thus is inappropriate for this research which aims to find answers, preferences and opinions from participants

3.2.3 Interpretive Research

Interpretive social science research is the third methodological approach to social science research. It can be traced back to 1864, when it was introduced by Max Weber. He argued that social science needed to study meaningful social action with purpose (Neuman, 2003).

The interpretive approach is associated with the philosophy of meaningful interaction between the researcher and the researched (Neuman, 2003). The interpretive approach is defined by Neuman (2003) as a systematic analysis of socially meaningful action through the direct detailed observation of people in natural settings in order to arrive at understandings and interpretations of how people create and maintain their social worlds.

The Interpretive paradigm is based on the fact that human beings create meaning in their world and this meaning is constructed as result of interaction with their surroundings and other people. Denzin and Lincoln (2002) argue that interpretive research takes account of the relationship between the research and respondents. They argue that during a research the researcher and respondent come into ‘communal contact’ which is not possible under traditional research.

This research philosophy best suits my research, as the purpose of my study is to uncover general public preferences with regard to interior design in single occupancy rooms and propose transformation in the healthcare environment. I will come into contact with people who once used hospital single occupancy rooms. This interaction with respondents will have an impact on the results obtained.

3.3 Research Approach

3.3.1 Subjective/Objective

Another significant choice which exists in the research paradigm adopted was the extent to which the researcher is subjective (involved in or has an influence on the research outcome) or objective (distanced from or independent) in the research. Easterby-Smith et al. (1991, p 33) discussed the traditional assumption that in science the researcher must maintain complete independence if there is to be any validity in the results produced. This hypothesis was maintained in this research as participants were left entirely free to decide on what they prefer in a hospital design.

3.3.2 Interview vs. Consultation

This section explains the different techniques available for data collection and why the researcher chose to use consultation & co-present collaboration rather than an interview approach to collect data from the participants.

3.3.2.1 Interviews

An interview is defined as a conversation between two or more people (the interviewer and the interviewee) where questions are asked by the interviewer to obtain information from the interviewee. Conducted usually on a one to one basis, it is designed to reveal the underlying motives of the interviewee's attitudes, behaviour and perceptions (Oxford English Dictionary, 2008).

3.3.2.2 Consultation & Co –Present Collaboration Mode

Consultation is identified as collaborative work between people who are physically close to each other in a certain situation. Perin (1973) states that the involvement of the user in the design of the environment helps to ensure that specific needs are met, and can improve user satisfaction and well-being (Hesham, 2006).

The consultant assists the client in discovering, defining, and developing a plan to act upon problems which occur in the target area (client's environment) and are in need of change. The collaborative approach is highly appropriate for individual consultation (Kurpius, 1976).

An example of co-present collaboration would be the process which occurs at a building designer's office, where the home owner reviews house plans for the renovation of his living room. After going over some of the paper sketches, the designer offers to show the home owner 3D models of the renovation on his computer. This will give the client a better idea of how his plans fit in with the rest of the house.

As the designer goes through the design of the living room with the client, he encourages the client to provide suggestions on how to change the plan to his/ her preference. Together the designer and client arrange furniture and experiment with different room layouts and colour schemes.

Data was collected using the consultation and co-present approach in this research and done by designers. More discussions about how data was collected are presented in section 3.4.4.

3.3.3 Method of Choice-Thematic Analysis

During the preparatory reading about the methodology for this research study, I discovered that the process of thematic analysis was challenging that enabled good descriptive qualitative findings. Thematic analysis approaches were adopted in this research study with the aim of collecting data using CAD and consultations with participants to gain perspectives and insights about healing environments and hospital room design. Thematic analysis is seen as a foundational method for qualitative analysis (Holloway & Toders, 2003). One of the benefits is its flexibility. It provides a flexible and useful research tool, which can potentially provide a rich and detailed account of data. I want to identify interior design and décor people preferred in hospital rooms and thematic analysis provided the researcher with flexibility to answer the research question and develop this study research theory.

3.3.4 Thematic Analysis

Thematic analysis of free flowing text can involve focus on words or large blocks of text (Ryan and Bernard, 2000). Thematic analysis is a method for identifying, analysing, and reporting patterns (themes) within data (Patton, 1990). The author further describes thematic analysis as qualitative data reduction (Patton, 1990). It minimally organises and describes data in (rich) detail. However, it often goes further than this,

and interprets various aspects of the research topic (Boyatzis, 1998). Thematic analysis should be seen as a foundational method for qualitative analysis (Braun, 2005).

Thematic analysis is about finding themes in the data. A theme captures something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data (Patton, 1990). Within the process of the data analysis there is a need to identify concept, themes and meaning within the data (Patton, 1990). According to Ely et al. (1997), the language of ‘themes emerging’:

“Can be misinterpreted to mean that themes ‘reside’ in the data, and if we just look hard enough they will ‘emerge’ like Venus on the half shell. If themes ‘reside’ anywhere, they reside in our heads from our thinking about our data and creating links as we understand them” (p 205-6).

Stenner (1993) and Usher & Mooney-Somers (2000) stipulate that thematic decomposition analysis is a specifically-named form of ‘thematic’ discourse analysis which identifies patterns (themes) within data, and theorises language as constitutive of social meaning. In this study, the researcher was engaged with participants in discussing their preferences of single occupancy design through an inductive and interactive approach. As result of this approach, the researcher built up prior knowledge of the data collected and some thoughts about the initial analytical approach was considered. With this in mind, it was vital to review and read the notes taken in order to become familiar with the data (a process of self-immersion in the data).

A process of six step analysis took place and thematic data analysis was conducted by reading and re-reading the transcripts of each consultation (refer to chapter four for more detail).

3.4 Research Strategies

3.4.1 Summary of Research Strategies

The following table summarizes research strategies

Design Strategies	
Purposeful sampling	The General public were selected because they are “information rich” and illuminative; that is, they offer useful manifestations of the phenomenon of interest which produces insight into the phenomenon (Patton, 1990).
Data Collection Strategies	
Personal experience and engagement	Researcher has direct contact with and gets close to the people, situation and phenomenon under study. The researcher’s personal experience and insights are an important part of the inquiry and critical to understanding the phenomenon (Patton, 1990).
Analysis Strategies	
Inductive analysis	Thematic/content analysis. Immersion in the detail of the data collected to discover important patterns, themes, and interrelationships; begun by exploring the data, then conforming; guided by analytical principles rather than rule; end with a creative synthesis (Boyatzia, 1998).

Table 3: Research Strategies

3.4.2 The Recruitment Phase

Streubert (2003), states that in qualitative research the number of participants is dictated by data saturation and sample sizes include 5- 50 participants. Brink (2000: 142) recommended that researchers should select 20 – 30 subjects for a qualitative study since too many subjects could complicate the data analysis process (Brink, 2000: 142). Lincoln and Guba (1985) state, the size of sample is determined by informational considerations. The researcher’s primary plan was to engage with at least 25-30

participants in this research study which was conducted in Tripoli Medical Centre-Libya, between 21 January to 28 February 2011. However, due to the war in Libya the number of respondents who took part in this study was limited to eighteen due to safety considerations regarding the researcher and participants.

Morse (1989) indicates that saturation dose occur in research, and this only applies to particular samples in a particular research.

In this research, despite the researcher consulting 18 samples during the data collection, it was felt that data saturation was achieved and no new information occurred after ten consultations took place. Data saturation occurred after consulting 10 people and there was no need to continue consulting participants.

Lincoln and Guba (1985) state, if the purpose is to maximize information, then the samples terminates when no new information is forthcoming future from more samples (Lincoln and Guba, 1985 :p202).

Trochim (2006) says in clinical practice, we might use clients who are available to us as our participants. In this case, the participants were volunteers and most of them were invited to take part in Tripoli Medical Centre in Libya since the centre is used as a teaching hospital which provides support to all type of research.

An invitation poster which included the inclusion/exclusion criteria was displayed on the notice boards around both the Hospital and Tripoli University requesting participants to volunteer to participate in the research.

On the poster, the researcher provided the exact details of the research. The poster was designed in an attractive way, in order to capture attention of the public (See attached appendix D). The poster contained the researcher's contact details.

The potential volunteer was invited to the hospital to have a consultation session. Once a participant, who complied with all the sample criteria, was identified, I met with the participant in the hospital. Most of the time, I arranged to meet the participant at their convenience.

3.4.3 Selection of Research Sample

Inclusion /Exclusion Criteria

Data was collected from people who met the following criteria:

- Are 18 years old or older
- Willing to participate
- Not currently/recently receiving active treatment

The following people were excluded from this research:

- Under the age of 18 year olds- since their participation required approval from their parents by the Law.

The initial aim was to consult 25 participants in this study, both male and female, over the age of 18 years old who met the inclusion criteria, as outlined above. None of the participants were under treatment or admitted to hospital. All the participants were willing to take part in this research.

No design knowledge was required for participants to take part since the research was using the laptop and driving the CAD software to facilitate the consultation session.

Consultations were conducted between 21 January 2011 and 26 February 2011. The sample consisted of young people between 19 to 56 years old who had been invited by Tripoli Medical Centre through Tripoli University in Libya. That group of participants consists of five Females and thirteen Males.

Only five of the participants were over the age of 45 years. Sufficient data was gathered to address the consultation questions and aims of this study.

3.4.4 Data Collection Phase- Consultation and ArchiCAD

The consultation was conducted to assist the researcher in discovering, defining, and developing a plan to act upon problems which occur in the target area (client's environment) and are in need of change. The collaborative approach is highly appropriate for individual consultation (Kurpius, 1976).

The qualitative research consultation can be described as a discussion between researcher and participant with a purpose and a structure determined by the researcher. The goal was to obtain descriptions of various aspects of hospital room design. The

researcher kept the purpose of this study in mind to ensure that the aim would be achieved. The researcher used open-end questions for data collection during the consultation session.

The researcher utilized a CAD program (three dimension computer aided design) on a laptop to help in capturing accurately the participants' views as they suggested and described their preferred room design. From this feedback the researcher continued to manipulate the 3D image on the computer until all a respondent's preferences were captured

Together, the researcher and participant experimented with different room layouts and colour schemes (Refer to section 4.8). A consultation guide was prepared to ensure that important questions would not be forgotten during the discussion (See Appendix A consultation guide attached). Consultations were conducted individually, and notes were taken. For political reasons, voices were recorded on two occasions only.

The consultation was conducted as follows:.

- The researcher tested the laptop and 3D CAD software functionality and speed well in advance of the consultation.
- The researcher put the respondent at ease and explained the purpose and procedure of the consultation (see consultation guide Appendix A).
- The researcher utilized a consultation guide which helped in designing the room. The researcher also followed the guide, but was able to follow topical trajectories in the conversation that strayed from the guide when he or she felt this was appropriate.

Consultation with participants was used to collect data between 21 January 2011 and 26 February 2011.

3.4.5 Participant Collaboration

In this study participant involvement was vital and in fact helped the researcher in the design of preferred single occupancy. Cortvriend (2005) states that:

“Involvement of user in the design of the environment helps to ensure that specific needs are met, and can increase user satisfaction and well-being” (Cortvriend, 2005).

Perin (1973) suggests the originator of the new design is the client. The user should be involved in what they want to build or design (Patton, 1990). Hospital room users are the client here, therefore the general public should be involved in generating the future design process.

That may help the interior designer to be very clear about user preferences in regards to single occupancy, which will eliminate the negative environment quality (Scher, 2001). Collaboration between designer and user will help identify the possible design for the future and the discussion will help user and designer.

If Healthcare providers would like to offer the best and most convenient service, then they should ensure the environment is suitable for its user.

The technique was used in this research study to help the designer create and raise awareness of user needs and for decision making. My approach shows how useful it is to use such method.

3.4.6 The Process of Creating Designs during the Data Collection

The design process and design thinking are at the root of what and how the interior designer thinks (Vaikla-Poldma, 2007). Interior designers use this process as a guide through complex sets of requirements that are contained within all projects (Poldma, 2008). See figure 11 below.

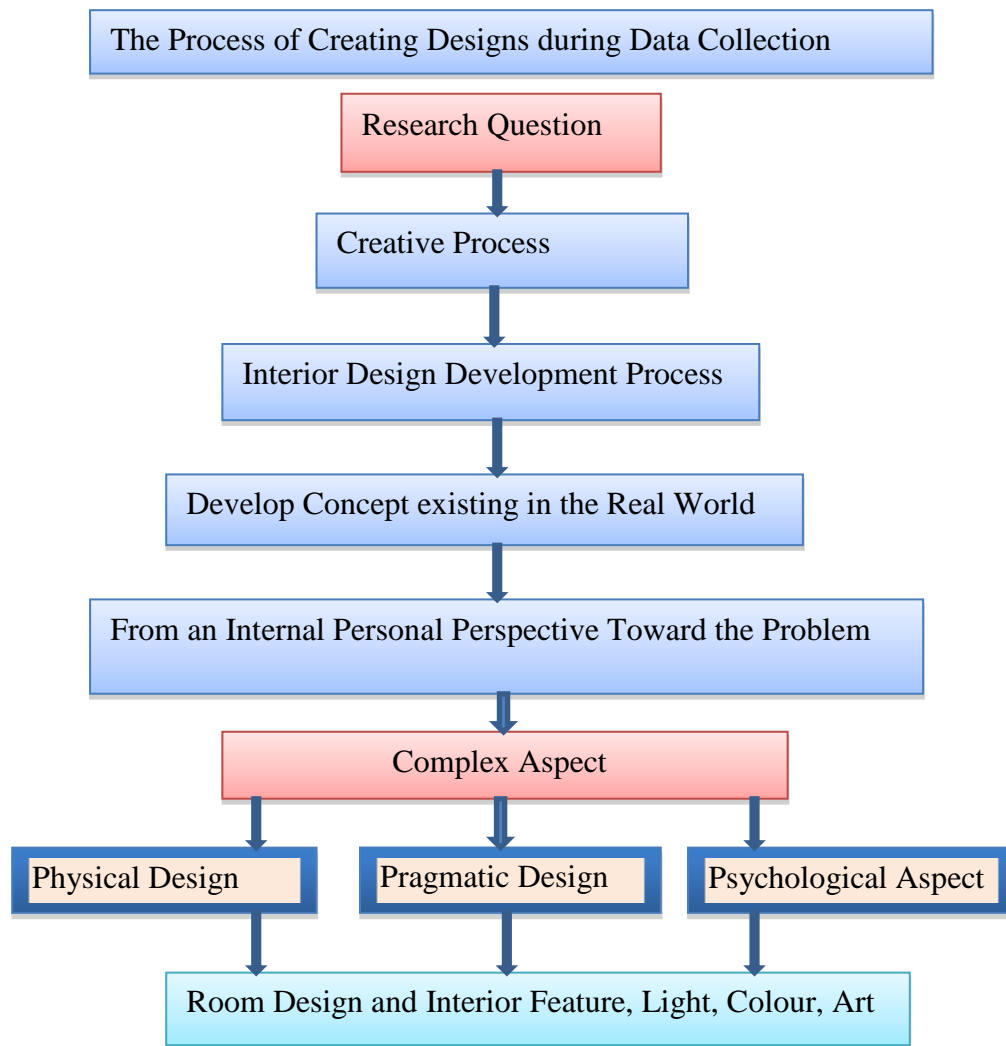


Figure 11: The Design Process

In exploring participant ideas about room interior design, the researcher asked participants questions. This was to understand people's preferred design on 3D through their own lived experiences about preferred room design.

Currently, the design process consists fundamentally of two layers: the creative process, and the design development process. The researcher applied this process during the consultation session. This is a brief overview of each step taken during the data collection:

3.4.6.1 The Creative Process

First, the creative process is the one most emphasized in designing a hospital room, where the researcher and participant explore the aesthetics of interior space, based on a consultation session with the participant. The researcher and the participant collaborated. As the researcher guided the CAD program he encouraged the participants to give their views on the design and on developing a set of design criteria.

Human elements play an important, if not primary, role in meshing creative ideas to social activities in space (Vaikla, 2003). This is where a playful, artistic sense encourages the discovery of new ideas, of alternative possibilities. From this creative process there evolves a design concept (Vaikla, 2003).

3.4.6.2 The Design Development Process

Second, the design is developed into a concept that exists in the real world, within certain parameters that are concrete and real (Vaikla, 2003). Interior design is the space set within a larger space or building, which acts as the framework for human activities. Interior designers look at space from the inside out, and from an internal personal perspective.

These design acts are often intertwined with complex aspects of physical design including pragmatic and psychological aspects that affect human perception and sensory experiences of room design (Vaikla, 2003). Colour, lighting, materials, and furnishings, all play a role and the designer (researcher) seeks to intertwine these with more practical pragmatic aspects of design with the aesthetic concept.

3.4.7 Steps in Preparing for the Consultation and Design Activities

This section attempts to explain 'how designers design'. As far back as the 1960s, a method of introspection was used by psychologists, where the subject was encouraged to give a coherent verbal report of their own cognitive process (Somerén et al., 1994). Then, innovative methods for analysing the verbal report of problem solving was used (Newell et al., 1972; Ericsson et al., 1993).

Analysis of the formalized intuitive aspect of design has been the basis of design cognition (Zafer et al., 2002). Sketches, being an important part of design, store the design solutions (Akin, 1997). Sketches are used for revising and refining ideas, generating concepts and facilitating problem solving (Akin, 1997).

Most design studies based on design procedure have used free hand sketches to analyse design activity. The researcher in this study has developed the use of free-hand sketching, into digital visual analysis for better understanding of the form, as a way of support for visual thinking.

Marx (2000) supported this idea by pointing out that intensive visualization in computer media influenced the designer to generate imaging in mind more often than free-hand.

The following section attempts to explain ‘how the researcher designed the single occupancy room’; and how the researcher used the CAD Software step-by-step.

Detailed below are segmentation activities adapted to the design of interior occupancy rooms (Bilda and Demirkan, 2003).

1. Mentioning the space only, or draw the space component. See figures 12-13 below

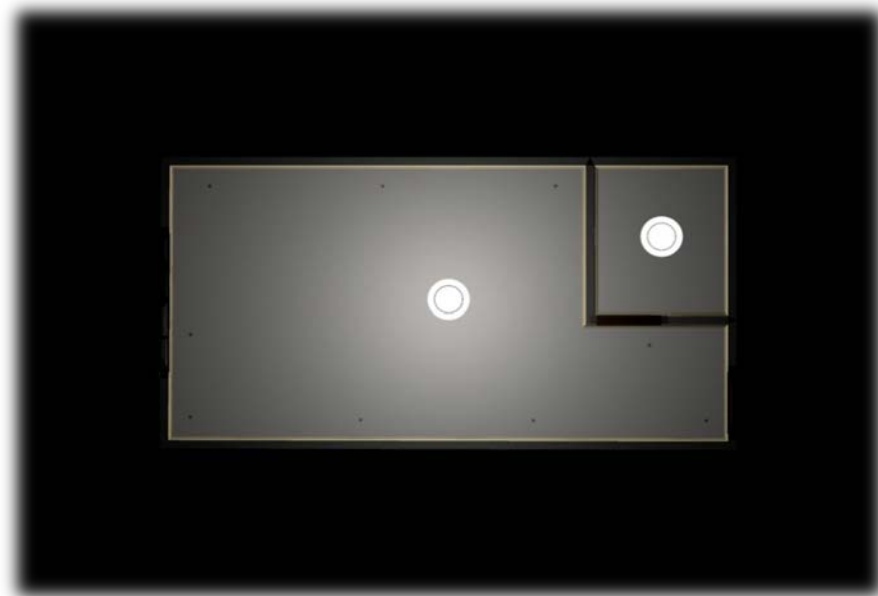


Figure 12: Single Occupancy



Figure 13: Single Occupancy 3D Perspective

2. Put things/objects into the space component, which includes drawing spatial elements (doors and windows). Drawing single occupancy room furniture (bed, table, sofa) See figures 14-15-16 below



Figure 14: Single Occupancy with Furniture



Figure 15: Single Occupancy 3D



Figure 16: Elevation

3. Transformation of a space component. Deciding on the interior heights, adding television stand, curtains, and bookcases. See figures 17-18-19 below.

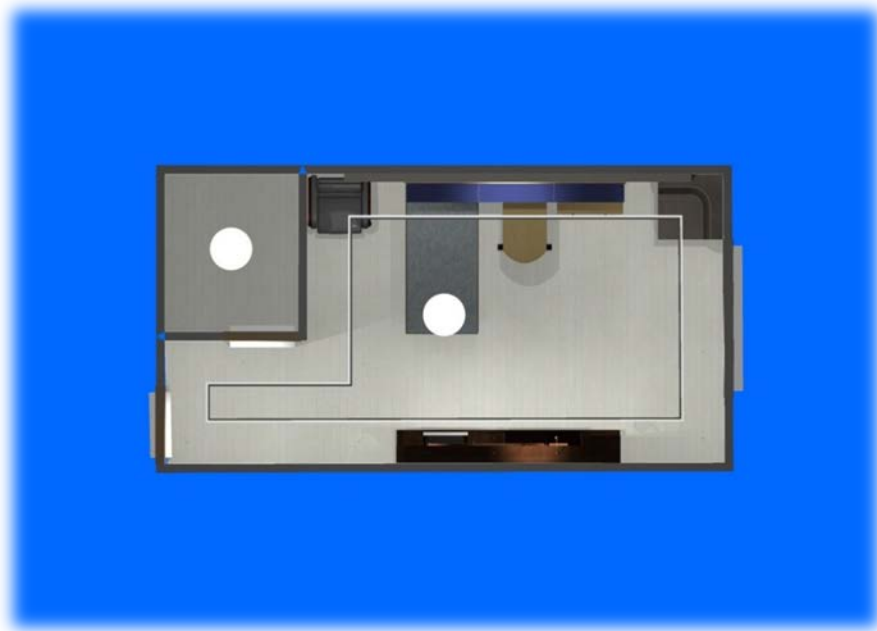


Figure 17: Transformation of the Room



Figure 18: Isometrics



Figure 19: Perspective

3.5 Data Analysis

According to Aas (1975), the designer is supposed to shape the environment so that certain activities can take place and so that certain human needs are satisfied. In order to accomplish that purpose, the designer must become aware of activities that may take place in the designed environment, and should obtain data from the user in the designed environment (Intille et al., 2003). It was possible to collect through participant consultations, descriptive detail on several elements of the design aspects. As outlined above, the purpose of the data analysis is to understand user needs and preferred interior elements in hospital rooms which may increase user satisfaction with the designed environment.

Thematic data analysis of the consultation was utilized based on conceptual analysis of two main concepts: people satisfaction, and preferred interior features in single occupancy room design.

3.5.1 Thematic Analysis

In this study, the researcher was engaged with participants in discussing their preferences with regard to preferred single occupancy design through an inductive and interactive approach. As a result of this approach, the researcher built up prior knowledge of the data collected and some thoughts about the initial analysis was considered. With this in mind, it was vital to review and read the notes taken in order to become familiar with the data (a process of self-immersion in the data).

A process of familiarizing took place and the self-immersing in the data was conducted by reading and re-reading the transcripts of each consultation.

The thematic process was an inductive process, consisting of six phases, which was completed manually. The following is a step by step process that was utilised in order to analyse my research data:

Self-Familiarising with the Consultation Data

Reading and re- reading the data and noting down initial ideas (Boyatzis, 1998).

Self-immersion in the data involves repeated reading of the consultation notes and studying the 3D images collected from the consultation and then searching for meanings, and patterns (Boyatzis, 1999).

As a consequence, identification of possible patterns was shaped as I was reading through. At this stage, a preliminary process of data structuring, taking notes and making a plan for coding took place. The process of coding is part of analysis (Miles and Huberman, 1994).

Generating initial codes

An initial list of ideas about what was in the data, and what was interesting and relevant to the research question was generated. This phase involved the production of initial codes from the notes taken during the consultation and the coding of interesting features of the data in systematic fashion across the entire data (Boyatzis, 1998).

Through a process of open coding, the basic themes were identified by reviewing the data line by line. Codes identify a feature of the data collected, which may appear interesting to the researcher (Boyatzis, 1998). The data was approached with one specific question in mind “What are the interior design and décor features preferred by the general public in hospital with special focus on single occupancy rooms”? All actual data extracted were coded, and then collated. Through a process of constant comparison the codes were compared to identify variation.

According to Kelle, (2004) coding can be done manually. Data was manually coded in this study by writing notes using highlighters and post it notes to identify segments of data (Kelle, 2004).

Searching for Themes

Boyatzis, (1998) states that it is important to collate code into potential themes and gather all data relevant for each potential theme. An initial list of ideas about what was in the data, and what was interesting about them in relation to the research question was

generated. This phase involved the production of initial codes from the notes taken during the consultation.

Reviewing Themes

Checking that the themes worked in relation to the coded extracts and the consultation data (Boyatzis, 1998). An initially coding was accomplished and a list of different design codes identified. A process of sorting the different codes into potential themes, and mind-maps to organise the theme into theme piles took place (Braun and Wilkinson, 2003). A process of final analysis and themes refinement took place; themes were broken down into separate themes (Boyatzis, 1998).

Two levels of reviewing and refining of themes also were accomplished (Boyatzis, 1998). Level one involved reviewing the level of the coded data extracted to ascertain a coherent pattern. Level two processes were similar: the validity of individual themes in relation to the data was considered.

Theme definition was made throughout the data. Boyatzis (1998) indicated by ‘define and refine’ we mean identifying the ‘essence’ of what each theme is about as well as the themes overall. Patton, also goes on to say, the researcher should have a fairly good idea of what the different themes are, how they fit together, and the overall story they tell about the data by the end of this process (Boyatzis, 1998).

Defining and naming themes

Names need to be concise, punchy, and immediately give the reader a sense of what the theme is about (Boyatzis, 1998). In the light of that, the researcher identified four major domains as sources of satisfaction involved in “participant preferred” hospital rooms and hospitalisation. Those include aesthetic quality, technology, personalisation, mobility and flexibility.

Phase	Description of the Process
1. Familiarising myself with the data:	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas.
2. Generating initial codes:	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3. Searching for themes:	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes:	Checking the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
5. Defining and naming themes:	On-going analysis to refine the specifics of each theme, and the overall story the analysis tells; generating clear definitions and names for each theme.
6. Producing the report:	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back the analysis to the research question and literature, producing a scholarly report of the analysis which should include 3D images.

Table 4: Phases of Thematic Analysis (Boyatzis, 1998)

3.6 *Enhancing Research Rigour*

Rigour in research is defined by Chiovitti and Piran (2003, 430) as increasing the quality of research data through improving credibility, auditability, and fittingness of the research.

3.6.1 Establishing Trustworthiness

3.6.1.1 Member-Checking Task

One strategy to maximise the trustworthiness of the findings is to undertake member checks. Member –checking is a process that gives the researcher the opportunity to validate his research by reviewing the findings with participants (Lincoln and Guba, 1985).

Lincoln and Guba (1985) indicate that the process of member-checking can be conducted at two points, that is, during the research and after completing the research.

The member checking task in this research was conducted in the first stage of data collection during the design stage. As part of the design process, the participants had opportunities to review and discuss the preferred single occupancy design in 3D views for modification. Some of the participants modified their view and others were happy to see the final design.

On two occasions the researcher had to re-design the layout, because a participant did not like the design after the design had been finalised. The process used in the modified design was very similar to the actual consultation session, but on a small scale and discussion took place to obtain more accurate detail. The outcome was satisfactory to the participants and they agreed with the researcher that this was their ideal room design.

3.6.1.2 Credibility

The credibility of any research study is enhanced by allowing the participants to guide the research process (Chiovitti et al., 2003, 430). In my research the participants guided the research throughout the consultation session, where they led the researcher to design their preferred single occupancy room through describing the interior elements of room design. The participant's views of the preferred room were used for the final analysis.

3.7 *Ethical Consideration and Ethical Approval*

Prior considerations were given to some ethical issues in conducting research. Those considerations related to the importance of the health and safety of the participant, anonymity and confidentiality, the voluntary status of the participants, and clarifying the purpose of research and reporting findings (McNamara, 1994).

Munhall and Boyd, (1993, p 403) indicated that the researcher has an ethical obligation to explain and describe the participant's experience in a realistic way. If the researcher respects the participant during the research, then he is presented with clear research guidelines and a plan of how to conduct the research following an ethically sound method (Brink, 1996, p 39-40).

It is also important to reflect on how this is applied throughout the research phases. Throughout this research study careful attention were given to those issues. These are discussed below in further detail.

3.7.1 *Planning Phase*

Prior to the research, the researcher was under an obligation to present a proposal, consent form, participant information sheet, and consultation schedule and obtain approval. This study proposal was approved by Bournemouth University ethics committee and I applied for and was given permission by Tripoli Medical Centre committee to conduct research, and invite participants into their hospital.

Tripoli Medical Centre and Bournemouth University ethics committees presented me with an ethics clearance letter, which I used to conduct the research within the hospital facilities (See attached appendix M &O).

3.7.2 *Recruitment Phase*

This phase involved the recruitment of participants using poster invitations which were displayed around the hospital and Al- Fatah University. A considerable number of participants applied to take part in the consultation. Participation was voluntary and participants who met the sample criteria were identified. The researcher met with

participants in the hospital office which was allocated for this study at the participant's convenience.

McNamara (1994) suggests the importance of explaining the purpose of the study. The purpose, aims, proposed methods and importance of the study were provided in the information sheets given to the participant who met the eligibility criteria. During the meeting, the participant had a chance to understand the aims and objectives of the research as summarized in the consent letter (See attached Appendix C).

As suggested by Munhall and Boyed (1993) it is important to obtain informed consent from participants. Participants were informed that their decision to participate or not would not affect this research study.

3.7.3 Data Collection Phase

Health and safety of the participants during data collecting were ensured all the time and this was emphasised throughout the study. The researcher explained the issue of confidentiality, anonymity and the freedom of withdraw. Some participants refused to give permission to digitally record the consultation for reasons relating to Libyan politics.

The following measures were kept in mind during the data collection:

- (1) The primary concern of the investigator was the safety of the research participant. This was accomplished by carefully considering the risk.
- (2) Access to support groups in Tripoli Medical Centre: Since the researcher had to invite the participants for a consultation session which was held at Tripoli medical centre, the researcher investigated the support resources available before the consultation session began.
- (3) The scientific investigator obtained consent in writing from each research participant.
- (4) The investigator considered how adverse events would be handled and how to care for a participant injured in a study.

- (5) There were no embarrassing or offensive questions asked during the consultation.
- (6) Participants in this research were not put through any procedures that might lead to psychological harm, feeling stupid, embarrassed, humiliated, sad, angry etc.
- (7) Information: Participants was informed about the aims, the purpose, the proposed methodology and the importance of this research. The health and safety, dignity and well-being of the research participants were ensured and this was emphasised throughout the study.
- (8) Anonymity and confidentiality: sensitivity, anonymity and confidentiality were ensured. The study records show that the identity of the participants was kept confidential, as required by the law as follows:
- Anonymity: In this research the data collected, and the notes taken during the session were kept confidential. Name, contact details and any information that could identify the participant was removed from the CAD design plan before discussing the design with any other party.
 - Confidential information: All the collected material and the participants information, names, contact details were stored in a safe place under lock and key as required by law.

The stored information included the notes taken, the participants suggested plan and views regarding single occupancy design and all this material was locked in a filing cabinet at the School of Health and Social Care –Bournemouth University.

- (9) Right to withdraw: Participation in this study was voluntary and participants were allowed to withdraw or revoke my authorization for the use of the information at any time.

3.7.4 Ethical Approval

The study was granted two ethical approvals from Bournemouth University committee and Tripoli Medical Centre in Libya (See Appendix M & O). This study was operating in accordance with ethical issues relating to human subjects.

3.8 Summary of Materials and Methods

This section was designed to explain the various options available for the execution of the field research and the logic for the selection of the specific approach, strategy and methods applied in this research project.

The figure 20 below briefly summarises the single occupancy research. In summary, the overall methodology was based on an interpretive research philosophy.

- Inductive approach utilized in terms of looking for specific single occupancy interior and décor preferences and then move to the general preferences;
- Consultant session was employed as its research strategy;
- Uses 3D CAD method to visualise data as it is collected;
- Poster was used on notice boards around Tripoli University and Medical centre to invite participant to take part of this study;
- Content analysis method was employed to analyse the data for the design stage.

A process of six step analysis took place and thematic data analysis was conducted.

Thematic data analysis of the consultation was utilized based on conceptual analysis of the two main concepts: people satisfaction, and preferred interior features of room design.

The key findings concerning preferred single occupancy identified from this study and presented in the figure below include Environmental aesthetics, Technology, Personalisation, Mobility and Flexibility. Those findings are discussed in the next chapter

The discussion of this study's findings is aimed at raising awareness of the use of each aesthetic component. Interior designers and décor professionals who design hospital facilities should meet the ultimate users' preferences. This would help them refine their design skills to incorporate aspects which promote people's well-being.

The findings of this research and knowledge available around those areas which fill the gaps in current knowledge are discussed in chapter Five.

Chapter Five discusses the researcher's developed theoretical frameworks in relation to Environmental-User relationships in the healthcare setting and interior design.

In the next chapter a detailed discussion of how the data was analysed and how the thematic findings emerged is presented.

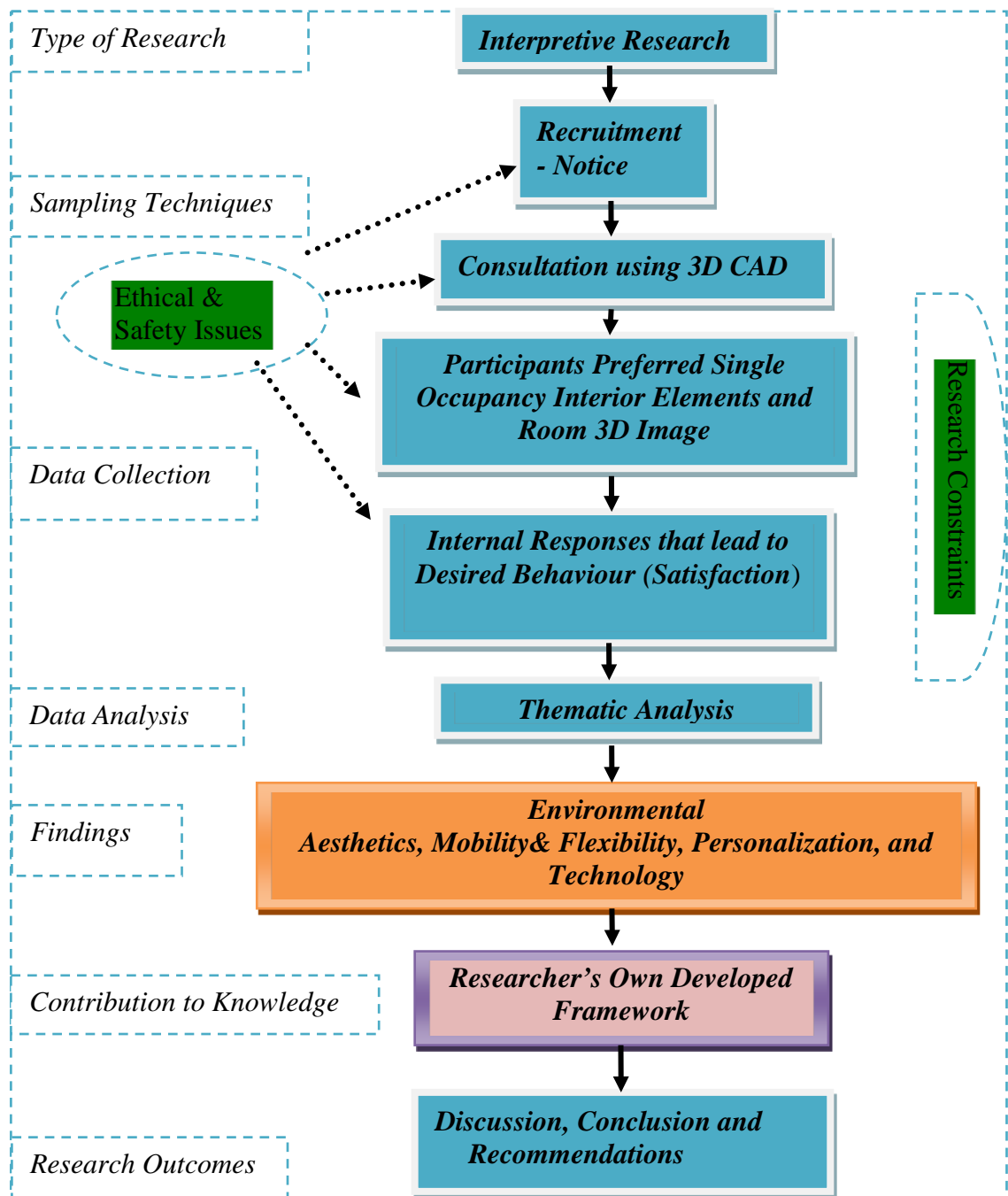


Figure 20: Summary of Single Occupancy Research

Chapter 4: Research Findings

4.1 Introduction

In the previous chapter I presented and explained the various options available for the execution of the field research and the reasons for the selection of the specific approach, strategy and methods applied in this research project and data analysis. In this chapter I present the data obtained from my consultations with participants, and how participants perceive each interior finding.

Background Information

In summary, the initial aim was to consult 25 participants in this study both males and females, over the age of 18 years old who met the inclusion criteria.

None of the participants were undergoing treatment or admitted to hospital. All the participants were willing to take part in this research. No design knowledge was required for participants to take part since the research was carried out using the laptop and driving the CAD software to facilitate the consultation session.

Consultations were conducted between 21 January 2011 and 26 February 2011. The sample consisted of young people between 19 to 56 years old who had been invited by Tripoli Medical Centre through Tripoli University in Libya. That group of participants consists of five Females and thirteen Males. Five of the participants were over the age of 45 years.

Sufficient data had been gathered to address the consultation questions and aims of this study. The results are concerned with participants' preferred single occupancy interior and décor features, and how individuals perceive each element which leads to satisfaction with the hospital room.

In studying the preferred single occupancy interior design features, I have uncovered elements that lead designers to a better understanding of participants' preferred hospital room design; and how the design process can be understood in order to create future hospital rooms, as well as the influence of the design elements.

I have analysed the data and I present it in this chapter and subsequently discuss my findings in relation to Bitner (1992) theoretical frameworks, which would make the design process meaningful for the designer and satisfy the needs of a participant in a hospital room. This chapter is divided into the following sections as shown in (Figure 21) below.

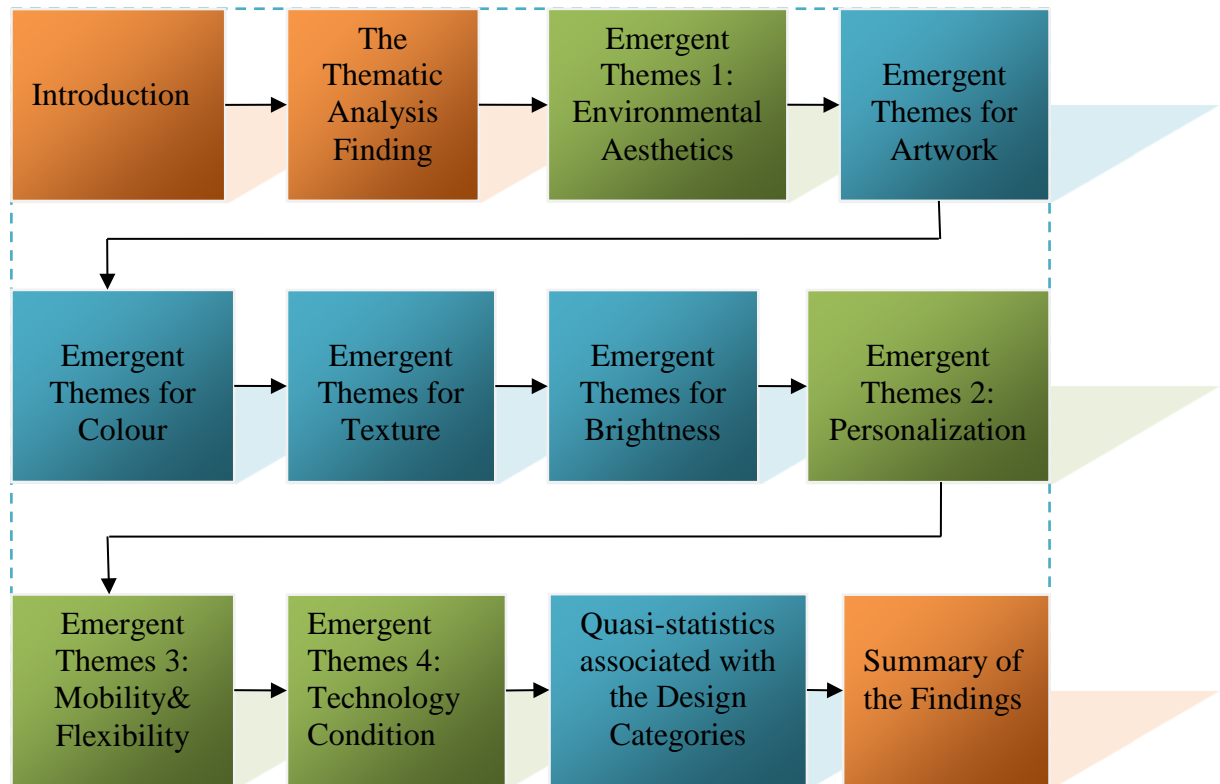


Figure 21: The Structure of the Research Findings

4.2 The Thematic Analysis Finding

The key findings relating to preferred single occupancy identified from this study include environmental aesthetics, technology, personalisation, mobility and flexibility.

The discussion of this study's findings is aimed at raising awareness of the use of each aesthetic component. Interior designers and décor professionals who design hospital facilities should meet the ultimate users' preferences. This would help them refine their design skills to incorporate aspects which promote people's well-being.

The views and suggestions made by the participants were considered as one analysis unit. The views, suggestions and the notes taken were read several times in order to achieve a sense of the content and then divided into interior features categories. Each time a new idea arises and was noticed in the content, a new view was started. The views and suggestions were both condensed and divided according to aspects of the focus of the discussion.

The content of the discussions during the consultation was widely varied. Aspects and features within the areas for discussion were identified and formulated in categories. Finally, threads of meaning that appeared in all categories were subsumed into a theme. A theme can be seen as a thread of meaning that appears in category after category (Baxter, 1991). The data was analysed manually.

The findings of this study reveal four major domains involved in “participant preferred” single occupancy hospital rooms and hospitalisation as sources of satisfaction.

These were discussed in relation to Bitner frameworks and how individuals perceive those elements. Those include the environmental aesthetics, Personalisation, Technology, Mobility and flexibility. See figure 22 below, which is the strategy and techniques employed for the data analysis:

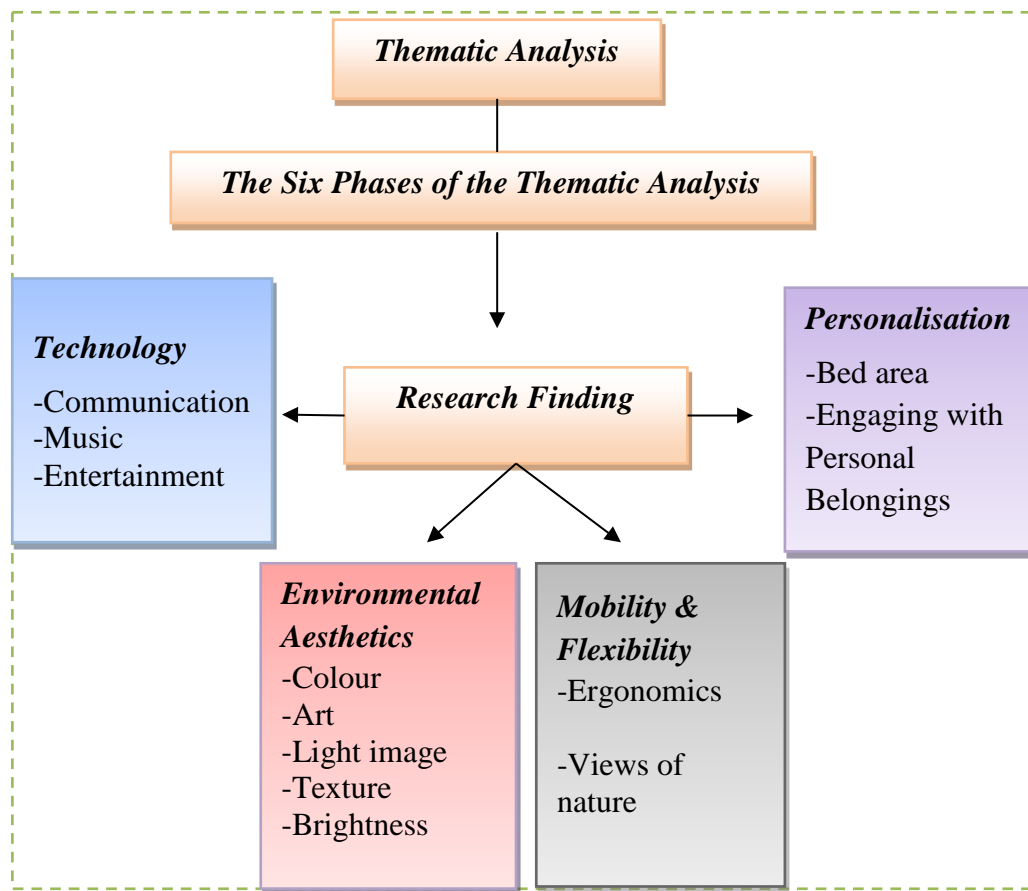


Figure 22: Keys of Thematic Analysis

• ***Environmental aesthetics***

The four aesthetic components identified as being particularly important to people's satisfaction in this study include artwork, colour, texture, and brightness. In combination these four components contribute to people satisfaction within the environment and create a friendly, welcoming atmosphere for the patient in the room.

• ***Personalisation***

Personalization is very important for people during hospitalization in single occupancy. Patients need to experience a familiar environment. Consistency among the spaces, functions, qualities and atmospheres within the hospital room.

These factors will promote satisfaction, maintain a positive frame of mind in users (patients) and enable them to remain positively engaged. One of the vital ways to accomplish this is by allowing users to personalise their bed areas, such as having their

own family photos, books, and a blanket brought from home. This is a way for patients to express their identity, reveal their interests, alter the room aesthetically and personalise it with familiar and valued objects which have meaning for them. See attached 3D design and animation movie.

- ***Mobility and Flexibility***

This is similar to personalisation in terms of user control of the room. Flexibility of layout is important for hospital room use. It is considered a support for people who have to spend a period of time in the hospital room.

One of the most important methods is to allow a user to move furniture, and having wheeled furniture will serve this demand. Allowing users to alter their room layout may provide them with the capacity to experience control and express their interest, and feel comfortable. See attached 3D design and animation movie.

- ***Technology***

One of the findings of this research study is that technology is one of the most important elements to the hospitalized user. The use of the internet, mobile phone and play station provides a room occupier with connections to the outside world and makes them feel less removed from their normal lives outside the hospital.

Hospital single room users would appreciate having a personal computer or laptop which has access to the internet to keep them linked to their family and friends. This may reduce the strangeness of hospitalisation. See attached 3D design and animation movie.

A discussion is presented below to explain how the findings emerge in relation to each of the domains. These include environmental aesthetics, brightness of the room, user's personalization, mobility and flexibility and technology.

In the discussion section a sample description which was taken from the participant's actual words during the consultation is presented.

4.3 Emergent Themes 1: Environmental Aesthetics

The four aesthetic components identified as being particularly important to "people satisfaction" in this study include artwork with light image, colour, texture and brightness. In combination these four components contribute to "people satisfaction"

within the environments and create a friendly and welcoming atmosphere for patients. (See visual images and animation movie enclosed).

The environmental aesthetics of single occupancy themes was discussed. These are the aesthetic features of the room, such as art work and painting, colour, texture, and room brightness. This study is concerned with the participant's need for a pleasing environment that creates a feeling of comfort and welcome in the hospital room. Figure 23 shows four aesthetic dimensions which influence the experience of the hospital room as discussed below. This discussion reveals how each of the environmental aesthetics findings was perceived by participants.

Three ways in which they influence user perception (psychologically, cognitively, and emotionally) were identified during the thematic analysis and will be discussed separately.



Figure 23: Environmental Aesthetics Component

4.3.1 Emergent Themes for Artwork, Light Image

The objective of this study was to identify single occupancy interior design and décor features preferred by the general public. This is to arrive at a description of preferred interior design elements and what constitutes user comfort.

Environmental comfort comprises three categories: Physical comfort, Functional comfort and Psychological comfort.

The objective is also to recommend single occupancy interior design and décor features that can be used by a healthcare designer which lead to desired behaviour.

These recommendations will enhance the experience of hospitalization and user's satisfaction and it will be useful for designers and policy makers.

The following section presents emergent themes which first address the preferred interior design and décor element and then the influences of those in relation to individual internal behaviours that were discussed in Bitner's Environmental behaviour framework. The excerpts below reveal the kind of art preferred by participants and how it is perceived and its impact in single occupancy hospital rooms.

Art Category

Example One:

Researcher: Could you please describe your preferred type of art, which you may like to have in your hospital room?

Participant: I would like to have some type of painting that presents nature, trees and clear sky. It would be nice if these were oil paintings (Entisar, 32).

Example Two:

Researcher: Why did you choose this kind of artwork?

Participant: I prefer this kind of art work because I like the garden, trees and nature. It is very colourful, uplifting and makes me feel happy and welcome, and this creates a distraction (Entisar, 32.)

Example Three:

Researcher: Where would you place it in the hospital room?

Participant: I would like to see the artwork opposite to my bed, 'cause it will change a boring room into an interesting one and it will be nicer to have more than one painting in the room (Osama, 28).

Example Four:

Researcher: Does this kind of artwork have any special meaning to you?

Participant: Yes, it's good. When I look at art work, I feel happiness and excitement, so I like the art because it will add a pleasant touch to this room. It makes me feel comfortable; I enjoy it (Sallah, 39).

4.3.1.1 Nature, Tree and Clear Sky

Participants revealed that nature is their preferred artwork in hospital rooms: For instance, one participant said “*I would like to have some type of painting that present the nature, tree and clear sky*”. Art is linked to providing variety of colour, room brightness and most importantly is an entertainment element, spiritually uplifting and comforting.

Art is also linked to the aesthetic appeal of the room design. When participants were asked about their preferred type of art they preferred art work that has views of nature and garden, and views which present trees and clear sky (see enclosed preferred visual 3D image and animation movie). See also Figure 24. Nature and tree view



Figure 24: Nature and Tree

4.3.1.2 *The Appeal of Garden and Trees*

Respondents were asked why, and they mentioned that “I prefer this kind of art work because I like garden and trees that present nature”. Nature artwork was their best choice and when I asked why they preferred nature art, all participants specified scenery with trees and blue sky is their favourite type of art. “It is very colourful, uplifting and make me feel happy and welcome and create distraction”. Then asked about the location of art, they indicated “I would like to see the artwork opposite to my bed, ‘cause it will change a boring room into interesting one and it will be nicer to have more than one painting in the hospital room” .

4.3.1.3 *Uplifting*

Asked why they liked nature, Participants indicated they preferred that because, “its good, when I look at I feel happiness and excitement, so I like the art because it will adds pleasing touch to this room. It makes me feel comfortable I enjoy it”.

“It is very colourful, uplifting and make me feel happy and welcome and create distraction”.

4.3.1.4 *Interesting:*

Participant, “I would like to see the artwork opposite to my beds, ‘cause it will changes a boring room into interesting one and it will be nicer to have more than one painting in the room”.

4.3.1.5 *Illuminated Artwork*

When asked about their other preferences, some say “Some sculptures will be nice, only animals due to my religious believe, but it will make the room lighter and nice”.

Overall, they specified that nature is their preferred element. See discussion above and refer to Appendix E.

Light Image Category

Example One:

Researcher: Tell me about other types of art which you may think are important for you?

Participant: Some sculptures will be nice, only animals due to my religious believe, but it will make the room lighter and nice (Norry, 24).

Example Two:

Participant: Art is nice, can you design a painting on the ceiling?

Researcher: Why on the ceiling?

Participant: So when I lay on the bed I will be able to enjoy it the most.

Researcher: Oh, good idea.

The participants in my research revealed that the display of artwork and light image on the ceiling in single occupancy are important for people satisfaction within the physical setting. The excerpts above reveal that during the consultation participants suggest art on ceiling “Art is nice, can you design a painting on the ceiling”. However since the interiCAD software has no facility to design such idea, the researcher discuss it for more detail, and asked for descriptions “It is paint with light behind it to make the actual paint stand out, so, If I look at a room ceiling” Participant says “Then it will be pleasing and bright rather than boring ceiling”.

Art provides a visual distraction, a source of entertainment, engagement, and a source of colour within the room. Participants revealed that illuminating art murals mounted on the ceiling over the bed could increase user satisfaction, provide a pleasing environment and create a positive distraction (See appendix F).

4.3.1.6 The Influences of Perceived Art and Emotional Responses

The influence of art on the participants leads to positive responses and creates a positive distraction. Human behaviour varies from individual to another, but in this research study, art display in single occupancy seems to be very pleasing and uplifting to the room occupier. The excerpts presented above reveal the link between art and the way participants feel. The perception of art leads the observer to feel happy, excited and relaxed. This feeling is linked to internal responses; more specifically it is linked to emotional responses. One Participant says:

“High quality art in healthcare pulls a person’s attention to the art and creates a positive distraction. Beautiful art is calming and uplifting”.

The above excerpt reveals how participants' articulation of the impact of environmental aesthetics on their behaviour is linked to individual internal responses, specifically to emotional responses. Interior designers must implement what users like to see within hospital rooms rather than selecting art to satisfy their own taste. Nature art is preferred and it leads to positive emotional responses. Enhancing these internal responses is vital to achieve desired behaviour in single occupancy.

4.3.2 Emergent Themes for Colour

Colour is also particularly appreciated by participants as one of the features in the environment that improve the quality of hospital rooms, influence behaviour and lead to a positive frame of mind. The participants in my research revealed that certain colours can be used to create illusions in the built environment and it gives an aesthetic feeling. See enclosed colour visual 3D image and animation movie.

4.3.2.1 Natural, Beige and Cream Colour

The participants in this study preferred light colours. It is clear that the majority of participants preferred bright or cool colour. The use of cool colour in the environment is linked by participants to feeling happier, calm and feels welcome in the environment. The excerpts below reveal participant preferred interior element, and why they select such colour. Participant asked about favourite colour, they indicated: "I like bright colour, such as Natural, Beige, and Cream, but I prefer Cream wall colour". (See appendix H.I.J)

Example One:

Researcher: What type of wall colour would you like in your room?

Participant: I like bright colours, such as; natural, beige, and cream, but I prefer a cream wall colour.

Researcher: Why did you select this colour? And how it make you feel?

Participant: It is a bright colour, and I think it makes me feel happier and may make the room bright too (Mabrok, 22).

Example Two:

Researcher: Would you like to refer to something that is important to you?

Participant: Yes, you did not ask me about the different finish in the room, I would like to say that texture is my favourite interior finish.

Researcher: Why do you like it?

Participant: Texture will provide a unique affect and the light will reflect which will create happiness (Ayah, 19).

Participants believed that if hospital rooms were painted in cool colours, such as blue or greens that would lead patients into a restful state and positive responses. See figure 25.

Floor Category

Example One:

Researcher: What is your preferred floor colour?

Participant: I prefer a moderate cream colour.

Researcher: What about the floor material?

Participant: Marble is nice and will make the room look good and it is easier to keep clean (Tarigk, 35). See figures 26 floor colours



Figure 25: Wall Colour



Figure 26: Floor Colour

4.3.2.2 *Makes me Feel Happier*

The excerpts below reveal that colour has strong effects on hospital room user.

Example One

Researcher: Why did you select this colour? And how does it make you feel?

Participant: It's a bright colour, and I think it makes me feel happier and may make the room bright too (Tarigk, 35).

4.3.3 *The Influence of Perceived Colour and Cognitive Responses*

The influence of colour leads to cognitive responses. The participants in this study preferred light colours. It is very clear that the majority of participant preferred light or cool colour. The use of light colour in the environment is linked by participants to feeling happier, calm and feels welcome in the environment.

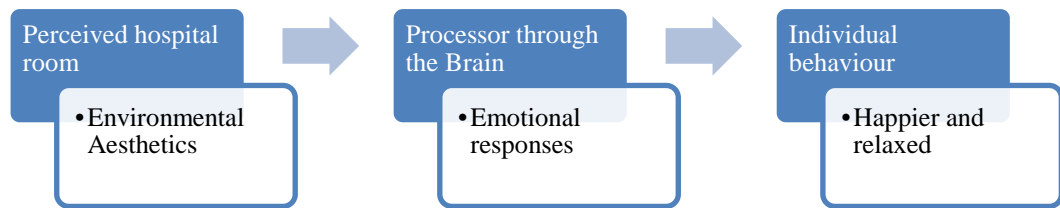


Figure 27: Flow Diagram showing Participant's Response to Aesthetics: Source: Researcher

Feeling happier, excited and welcome in the environment is clearly linked to individual internal responses. See figure 27. Feeling happy is linked to individual internal responses, specifically to emotional responses which lead to positive feelings (See appendix G).

4.3.4 *Emergent Themes for Texture*

4.3.4.1 *Texture is my Favourite Interior Finishes*

"Texture will provide unique affect and light reflect that create happiness" The participants in my research revealed that texture is an important element in the hospital room interior that brings a richness of material contrast; see an example of the data analysis and refer to the analysis see (Appendix G) which indicates how the texture emerges.

4.3.5 *Emergent Themes for Brightness*

Brightness emerged in this study during the consultation; the findings reveal that there is a consensus amongst participants as to what constitutes brightness. Participant indicated that brightness is a fundamental component of aesthetic environments in hospital single occupancy.

Brightness is fundamental component of single occupancy interior design. The consultation sessions revealed that there is a consensus on the importance of brightness amongst the participant that contributes to positive feeling.

Example One:

Research: What kind of furniture do you prefer in a hospital room?
Participant: Computer desk, patient's bed, visitor's sofa, bookcase, and a wardrobe.
Researcher: What about the material?
Participant: I prefer wood, more specific zane wood or mahogany.
Researcher: What about the colour?
Participant: Light, similar to nature (Ali, 49)

Example Two:

Researcher: Where would you place the bed?
Participant: I would like to have the window on the left hand side of my bed and I think the furniture should have wheels for mobility.
Researcher: Where would be your sitting area?
Participant: It would be nice if you locate it near the window so I can enjoy the view and the light from nature (Osama, 28).

Brightness in this study refers to the amount of light, and the type of wall colour which participant prefer in hospital room. A painting which represents nature with a clear sky and the use of Illumination art work can increase people's satisfaction with the hospital setting by attracting the room occupier's attention. Participants also revealed that the presence of plants would make the room bright and create positive feeling.

4.3.5.1 I would Appreciate Bright Colour

Brightness emerged throughout the consultation. Bright environment in this study is linked to the use of light wall colour, light furniture colour, light image, art, and a big size window to allow natural light into the room which may enhance the interior features.

Participants revealed how important it is to have bright rooms; brightness in this study is associated with the presence of bright interior features. For instance, art with bright colours is what participants preferred in single occupancy. They preferred pictures of clear skies and green landscapes. This kind of art is described as nature visual art. Consultation with participants using CAD revealed the significance of brightness and

what constitutes brightness. Refer to the animation movie for clarification of the concept of brightness used in this study.

4.3.5.2 Makes me feel Happy

Participants revealed that interior design features are important factors that lead to satisfaction behaviour during hospitalization.

4.3.5.3 Windows Views and Nature Light

The enjoyment of natural light is linked to the presence of big windows, which provide sky light as well as garden views. Refer to the extracted example above, which present brightness in preferred single occupancy room. The analysis table attached (See appendix F). See figure 28 Light and cool.



Figure 28: Light and Cool Environment

4.3.6 The Influence of Perceived Brightness on Individual

Participant indicated that brightness would make them feel happier and relaxed, in the field of psychology this is explained in terms of internal responses. Cognitive,

emotional, and psychological responses lead to feelings of comfort, belief, and excitement.

4.4 *Emergent Themes 2: Personalization*

Personalisation is very important for people during hospitalization in single occupancy. The ability to experience a familiar environment and similar types of spaces, functions, qualities and atmospheres within the hospital room is needed to increase satisfaction maintain a positive frame of mind and remain positively engaged. The participants reveal that personalization is a vital element that may help them adapt more quickly to their new environment. The excerpts below reveal how the personalization emerged.

Example One:

Researcher: Do you have any thing that is important to you that we haven't discussed?

Participant: Yes, I would like to have my family photos around me, my books, and personal belongings.

Researcher: Why?

Participant: The room would feel like home and I enjoy having my personal things around me (Zohair, 32).

4.4.1 *Family Photos*

One of the vital ways to improve hospital rooms is to allow hospital users to personalise their bed areas, with family photos, books, their own pillow and blanket. It is a way of expressing their identity and revealing their interests. See enclosed visual 3D image and animation movie. See figure 29.



Figure 29: Family Photo

4.4.2 Personal Belongings

Personalization in this study is linked to the use of personal belongings, such as a hand bag. One Participant revealed that touching their personal belongings will provide pleasure and happiness. This finding emerged during the discussion of the type of furniture the participant preferred in a hospital room and was not planned in the consultation schedule.

4.4.3 The Influence of Personalization on Individual

Participants indicated that having family photos or something of sentimental value would increase their satisfaction and lead to happier feelings through their cognitive responses. In the environmental behaviour field the individual responds to their surroundings through their perception which then lead to internal responses. See figure 30.

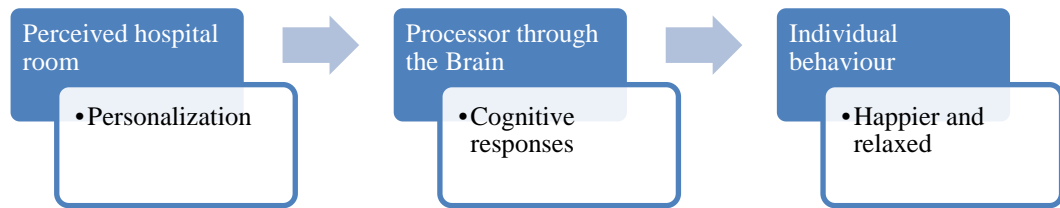


Figure 30: Flow Diagram showing Participant's Response to Personalization: Source: Researcher.

Cognitive responses affect user beliefs: however in this study the more familiar the environment, the better for the user since it leads to desired behaviour and satisfaction.

4.5 Emergent Themes 3: Mobility and Flexibility

This is similar to personalisation in terms of user control of the room.

Flexibility of layout is important for the hospital room user. It is considered a sort of support for people who have to spend a period of time in the hospital room. Flexibility also emerges in the communication category. Refer to attached 3D and animation movie for clarification of Mobility and Flexibility.

Example One:

Researcher: Where would you place the bed?

Participant: I would like to have the window on the left hand side of my bed and I think the furniture should have wheels for mobility (Mohamed, 19).

4.5.1 The Furniture should have Wheels for Mobility

The most important way to achieve mobility is to allow the user to move furniture, and having wheeled furniture will serve this demand. Participants revealed the need for mobility and the need for them to be able to move furniture around. See enclosed visual 3D image and animation movie. Allowing users to alter their room layout may provide them with the capacity to experience control and express their interest, and feel comfortable. Refer to the discussion in the table above to see how mobility and flexibility emerged. See figure 31



Figure 31: Flexibility

4.5.2 The Influence of Perceived Mobility and Flexibility on Individual

Participants indicated that their behaviour is influenced by how they perceive their mobility and flexibility. Capacity to control experience, express their interest, and feel comfortable is vital. Having control over the environment leads to relaxation and increases satisfaction. See figure 32. In the environmental behaviour field the individual response is linked to individual psychological through the patient's perception which then leads to internal responses.

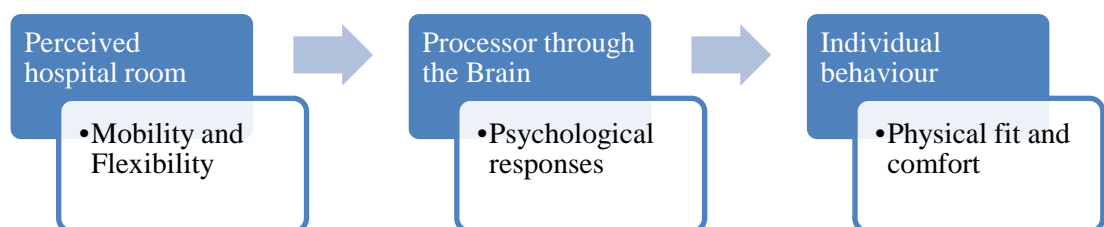


Figure 32: Flow Diagram showing Participant's Response to Mobility and Flexibility: Source: Researcher.

Psychological responses affect user comfort and physical fit; however in this study the interior designer should consider individual physical fit. Designing a simple room layout would lead to desired behaviour and satisfaction.

4.6 Emerging Themes 4: Technology

The role of technology is a new finding which will be discussed in chapter 5 as the technology condition that fills the current knowledge gap in healthcare design. Bitner (1992) theoretical frameworks didn't discuss the environmental dimensions of technology, since his frame work was developed in 1974. Refer to the researcher's own developed theoretical framework presented in chapter 5.

Technology is one of the most important elements for the hospitalized client.

The excerpts below reveal the importance of technology conditions for user satisfaction.

Refer to (Appendix K) to see how technology condition emerged.

Computer and Internet Category

Example One:

Researcher: How do you communicate with your family?

Participant: I use a mobile phone.

Researcher: How about landline?

Participant: No, unless I have to.

Example Two:

Researcher: Do you contact your family online?

Participant: Yes, I use my laptop to communicate with all my family and I it will be appreciated to provide a pc which allowed us to access the internet.

Researcher: What kind of pc do you prefer to use?

Participant: Laptop so I can use the internet in my Bed (Germawi, 45).

TV Category

Example One:

Researcher: Do you follow the news or any programs on TV?

Participant: Yes, Football and sport.

Researcher: Why do you follow it?

Participant: I enjoy watching the TV; I would also like to have a PlayStation in my room.

Researcher: PlayStation, that's interesting, Why PlayStation?

Participant: I always play games, therefore I need one as it will make me happy and keep me busy (Abd-allaha, 21).

Researcher: Tell me about your favourite music?

Participant: Classic music.

Researcher: Why this kind of music and how do you listen to it?

Participant: This kind of music makes me feel relaxed and calm and I always use my I pod.

4.6.1 Internet Access

Participants revealed that the use of internet and mobile phone provide the room occupier with connections to the outside world and makes them feel less removed from their lives outside of hospital. See figure 33



Figure 33: Internet and Laptop for Communication

4.6.2 Entertainment

PlayStation also is an important feature since participants reveal that this technology will provide entertainment and pleasure which may increase satisfaction with the environment (See enclosed visual 3D image and animation movie).

4.6.3 PCs or Laptop

Participants revealed that they would appreciate having a personal computer or laptop with access the internet which would keep them linked to their family and friends, and

that may reduce the strangeness of hospitalisation (see enclosed visual 3D image and animation movie).

4.6.4 The Influence of Perceived Technology on the Individual

Technology is one of the most important elements for the hospitalized client.

Technology influences behaviour and leads to internal responses, and physiological responses. Technology may be an innovation in this study, since no reference to it was found in the literature. The researcher could not locate any references in the academic fields that refer to technology as an element which enhances satisfaction in the hospital room. Technology was used only for the patient's medical treatment. In the study of environmental behaviour the individual response is linked to psychological comfort (See figure 34).

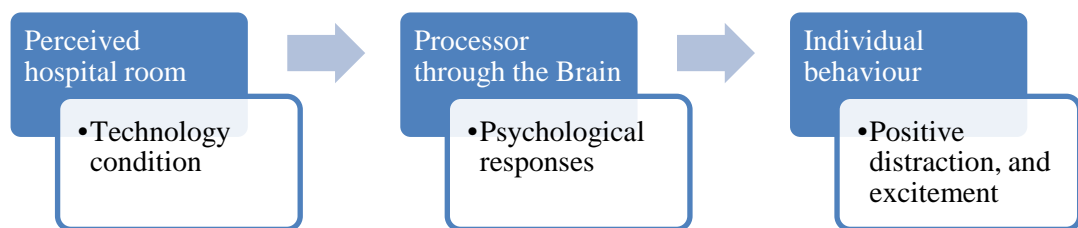


Figure 34: Flow Diagram showing Participant's Response to Technology: Source: Researcher.

Achieving Individual comfort, positive distraction, and excitement is relatively easy. Enhancing the use of technology will lead to desired behaviour and satisfaction and through these, to greater well-being.

4.7 Quasi-Statistics Associated with the Design Categories

Seals and Silverman (1997) argue that in order to enable validity and reliability the qualitative researcher should support generalizations by using an account of events ('Quasi-Statistics'). Counting categories could be useful. See table 5.

Silverman (1994) points out instead of taking the researcher's word for it, using 'quasi-statistics' the reader has a chance to gain sense of the data (Silverman, 1994). This analysis technique is creative and should enhance the validity of this research finding.

Categories			Elements	Number of Participant preferences	
Main	Sub	Sub-sub			Total
Interior elements	Ceiling	Colour	White, Light, and Cream	6 8 2	16
		Style	Simple	9	
	Door	Colour	White, natural Wood	13	
		Material	Wood	16	16
	Floor	Colour	Light and Earth-like		
		Material	Marble,	16	
	Wall Colour	Cool	Stone, Wood	2	
			Light, White, Blue, Cream, Light green, Beige	18	
		Warm	Yellow, Orange, Red, Brown	0	
	Window	Colour	Cream	11	
		Size	Large		
		Style	Modern		
	Texture	Colour	Bright and Light fuzzy and soft	11	
		Type	Soft		
Lighting	Lighting	Natural	Natural, Bright	18	
		Artificial	Soft, Pleasant, weak	16	
Furniture	Furniture	Colour	Light Beige, White, Cream, and Natural		
		Style	Modern	18	
		Arrangement	Flexible and mobile	14	
		Material	Wood, Soft	16	
Plant	Plant	Amount	Two - three	17	
		Type	Living	18	
		Order	Flowers	16	
		Colour	Green, and Colourful	14	
Music	Music	Type	Classic, and Pleasant	10	
		Tool	I Pod, MP3	11	
Window	View	Type	Nature views, Flowery and Beautiful	17	
Art Categories	Visual Art	Kind	Nature, representational of forest scene with water	16	
			Impressionistic nature with human subjects	0	
			Abstract with intense colour	0	
			Abstract with animal subject	2	
		Material	Surreal artwork	0	
			Oil Colour	14	
			Water Colour	4	
Technology	Entertainment	PlayStation, TV	Games	10	
			Positive distraction	17	
	Communication	Mobile phone	Connection with the outside world	17	
		Laptop And internet		14	

Table 5: Quasi-Statistics associated with the Design Categories

4.8 Summary of the Findings

4.8.1 Summary of Findings: Research Question One

What are the interior design and décor features preferred by the general public in hospital with special focus on single occupancy rooms?

Overall, the consultation data analysis showed that participants in this research were able to make significant suggestions concerning hospital room design.

Participants revealed unique ideas which could be useful for hospital room interior designers in the future. Within the consultation session, it was easy to understand participants' views and ideas since they were able to see the 3D image of the proposed hospital room features.

Key physical environmental features were identified; these include an aesthetically pleasing environment which includes art in healthcare, colour in healthcare, brightness in healthcare and texture in healthcare. Several more findings relating to preferred environmental features were: personalization, technology, mobility and flexibility.

In most cases, participants enjoyed the experience of hospital room consultation using CAD software. One said that "I do not mind doing this again and again, I enjoyed designing my preferred hospital room". Participants were comfortable answering the research questions and collaborating with me. My experience in conducting consultations with participants was successful. I enjoyed working with them on their view, and suggestions for hospital rooms.

Considerations in relation to single occupancy rooms include the significance of the interior design features and environmental aesthetics. Colour, artwork, texture, and brightness were the main findings of this research study as revealed by participants.

Mobility, flexibility and window views were also important for satisfaction, according to the participants. The findings suggest having control over the room and being able to move furniture around is important and will increase users' satisfaction with their surroundings.

The findings of this study also reveal that satisfaction is linked to being happy in the environment. Feeling comfortable and happy is a consequence of having the right type of furniture, colour, facilities, views of nature and access to technology.

Technology can make a considerable difference: the findings suggest that using a laptop, personal computer, and play- station can provide entertainment and induce a positive frame of mind.

4.8.2 *Summary of Findings: Research Question Two*

What internal responses will lead to satisfaction behaviours and how should the single occupancy be designed to bring about such response?

The findings of this research reveal that a participant perceives and responds to the environment in three dimensions.

Their responses are divided into physiological, cognitive, and emotional responses.

Their behaviour is affected by the physical setting. Environmental psychology literature indicates that users respond to their surroundings in three dimensions, cognitively, emotionally, and physiologically, and this is what influences users' behaviours.

Participants reveal that their perceptions of interior design features could lead them to emotional responses, beliefs, and physical responses; for example looking at artwork will make them feel happier and lead to a positive frame of mind.

Internal responses are divided into physiological, cognitive, and emotional responses.

These responses are explained below:

In this research a person's preferences concerning the hospital are impacted by their physiological responses. There are some designs which may elicit a certain physiological response to the patient's body which would lead to their preference for certain facilities and features.

Functionality should be considered during the stage of planning and designing of hospital rooms since it leads to physiological responses.

Functionality in design is related to the user's physiological needs which are supported during the interior space plan (Edward, 1992). These needs are related to human body

requirements in the occupied space. Interior environments must respond to all human functional needs to achieve both comfort and satisfaction (Edward, 1992).

The user's satisfaction with the interior space is dependent on the type of furniture, materials; equipment and finishes which create positive responses, so if a user has a comfortable setting then his response will be positive.

Each aspect of hospital room design, which includes the space furnishing, needs to be carefully assessed in term of its compatibility with the human body, since those elements influence individual behaviour.

The challenge is to plan for the hospital room user activities, furnishings, and finishes that are appropriate for the occupier.

Designers should consider the size and style of furnishings suitable for the individual. The better material a designer uses the better the outcome will be in terms of internal response to the hospital environment.

Participants perceive their surroundings through cognitive response which refers to a person's expectation of the environment based on their prior experiences and non-verbal communication evoked by physical cues in the environment.

In this study the respondent's cognitive association with either past healing or their own home design will affect their preferences. For instance if in the past the patient was healed quickly in a blue painted room where a painting was hanging, they would associate the past event with healing and thus indicate a blue painted room with some art as their preferred design and décor.

Emotional responses are divided into two dimensions, pleasure and arousal. Pleaser can be achieved by aesthetically pleasing surroundings. Arousal could be created through complexity, such as an uncoordinated interior design.

Hospital design and décor professionals and all healthcare providers require conditions that promote patient healing and satisfaction. Those experiences that create displeasure are viewed negatively and those that create pleasure are viewed positively. For example, the type of colour, whether cool or warm will influence behaviour. Will a patient's emotional response such as association with past emotional distress in hospital affect their choice of design?

This would mean patient preference is significantly affected by some emotional factors associated with the hospital and not direct personal preference. Also if the personnel of a certain hospital were very kind and caring, the research presumes this would also mean for them that past hospital's design will be preferred and vice versa.

Chapter 5: Discussion

5.1 Introduction

The purpose of this research was to identify interior design and décor elements preferred by the general public. The Mehrabian-Russell model for the environmental setting was adapted and used to test predictions from this model in order to improve hospital room design.

Addressing a hospital room user's needs to his or her satisfaction with healthcare facilities is only possible if these requirements are clearly documented and known and environmental behaviour theory understood fully.

Mehrabian and Russell's model frameworks contain valuable applications for the single occupancy setting. The theoretical model was developed by environmental psychologists Mehrabian and Russell, 1974; Russell and Pratt, 1980, and recently by Bitner, 1992. This framework appears to be particularly important in studying and understanding the physical setting and individual interactions between the environment and how people perceive their surroundings.

This chapter is informed by the findings of this research and knowledge available around those areas which fill current knowledge gaps. In this chapter, the researcher's developed environmental theoretical framework was discussed in relation to single occupancy in a healthcare setting.

The contributions made by physical dimensions, interior conditions, physical setting, internal responses, individual behaviours, design configuration, and desired behaviour were discussed.

This chapter is divided into the following sections as shown below in figure 35.

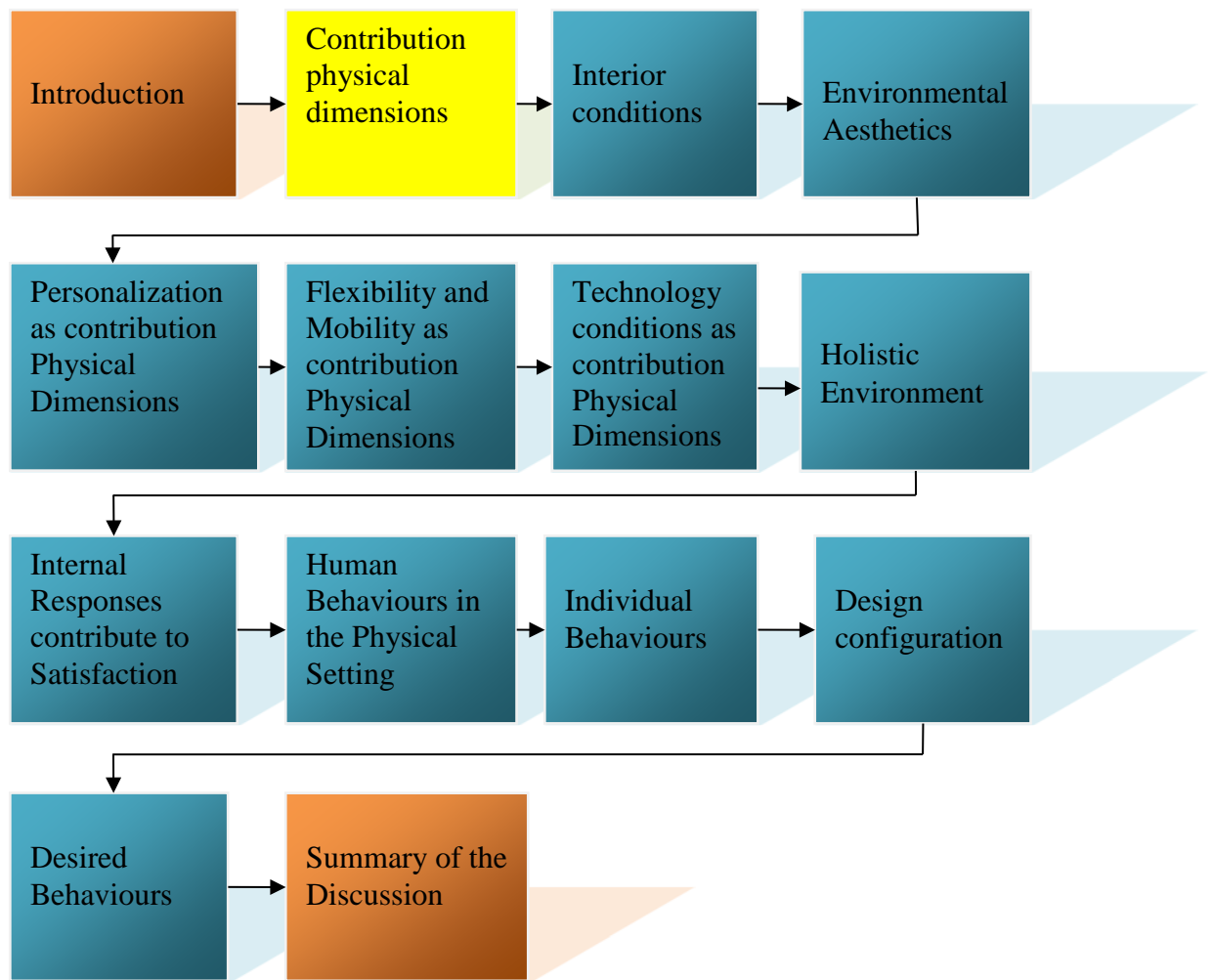


Figure 35: The Structure of this Chapter's Discussions

5.2 *Developed Environmental Behaviour Theory*

The researcher's conceptual framework addressing the question of how planning and designing a single occupancy room in a hospital could produce satisfaction and may enhance the environment and user's well-being is presented in figure 36.

Each of the researcher's own developed components frameworks are defined and discussed. The researcher's proposition based on the developed concept framework is highlighted below in figure 36.

The main focus is on:

- participant preferred interior elements
- user's behaviour influenced by the physical setting

- user internal responses
- individual behaviour
- design configuration
- The dimensions which constitute environmental satisfaction within single occupancy in hospital.

The findings of this study reveal that four major aspects which mainly influence satisfaction are environmental aesthetics, personalisation, technology, and mobility/flexibility.

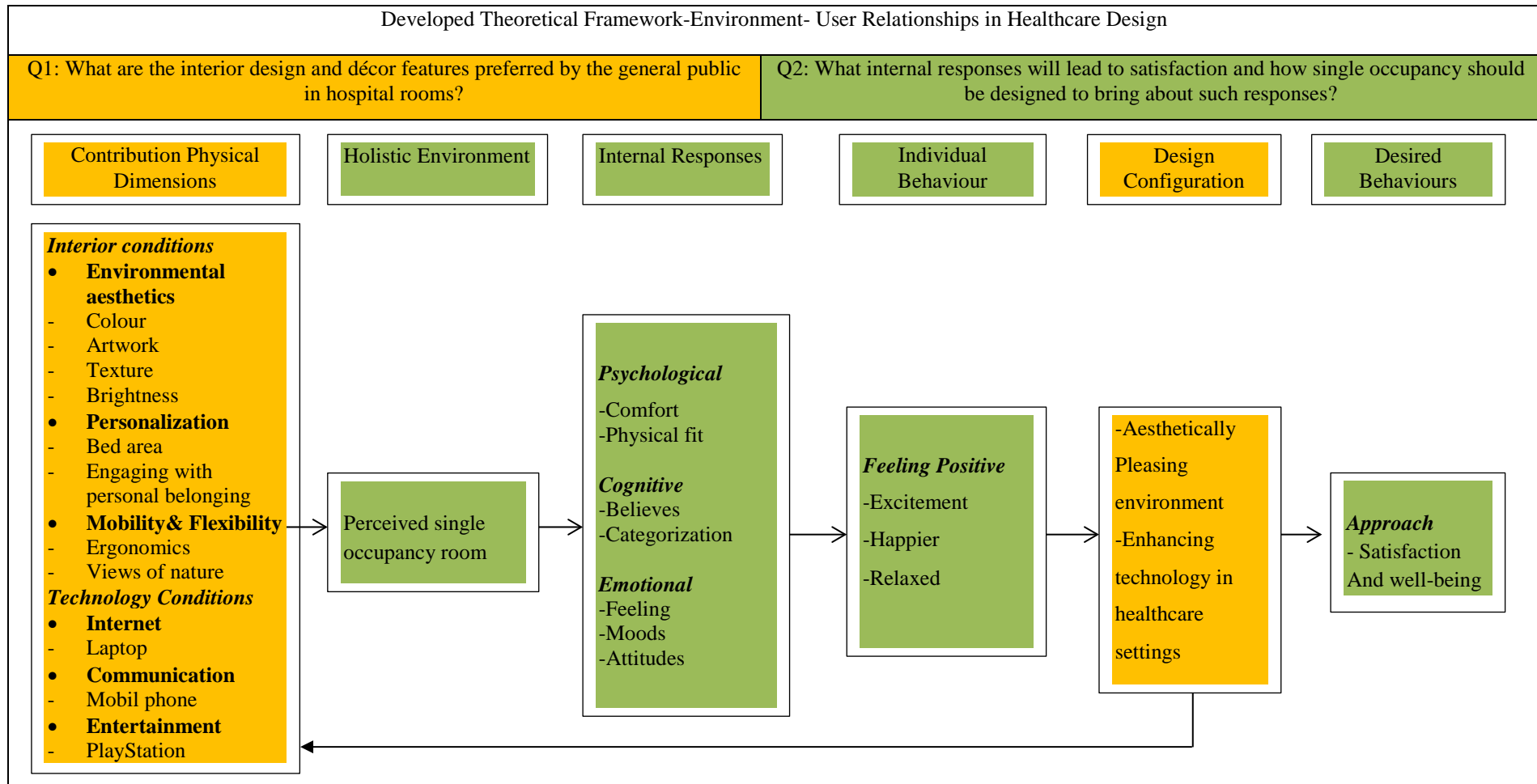


Figure 36: Source: Researcher's Developed Framework

5.2.1 Contribution of Physical Dimensions

The theoretical framework for the discussion is based on the research findings of single occupancy room research and not on Bitner's framework. It is instructed by the researcher's own developed framework which addresses environmental behaviour- user relationships in healthcare design.

The following discussion addresses the interior conditions and technology conditions which are considered as new knowledge that fill a current knowledge gap in Bitner's (1992) theoretical framework.

5.2.2 Interior Conditions

5.2.2.1 Environmental Aesthetics

Despite the lack of research, many design and health care professionals believe that aesthetically pleasing décor and artwork can influence and increase satisfaction with the environment (Fottler et al., 2000).

There is consensus among researchers that the aesthetics of healthcare environments is important to patients' feelings of well-being and satisfaction with the healthcare setting (Nasar, 1988; Ulrich, 1991; Nasar, 1994; Biley, 1996; Palmer and Nash 1997; Dijkatra, 2000; Fottler, 2000; Moore, 2000; Ulrich, 2001; Mazuch, 2003; Dijkatra 2006; Dijkatra , 2009).

The argument is that, creating aesthetically pleasing environments can enhance the healing process and improve patients' well-being. The aesthetic characteristics identified as being particularly important to people preferences and satisfaction with hospital single occupancy in this study includes wall colour, use of artwork, texture and brightness.

Those components which contribute greatly to people's satisfaction with hospital rooms are those which help people maintain a positive frame of mind, and remain positively engaged during hospitalisation. Refer to figure 36 for detail.

Several researchers have argued that creating aesthetically pleasing environments will contribute to patients' satisfaction and wellbeing by influencing their emotional response (Nasar, 1988; Mazuch, 2003; Dijkatra, 2006; Dijkatra, 2009). The findings

from this study would support this argument. Light, colour, artwork and furnishing are the major dimensions of environmental aesthetics.

These four aesthetic components were identified as being important to and have the capacity to provide messages of support and welcome.

The discussion concerning environmental aesthetics will revolve around people's preferences and responses to the use of artwork, wall colour, texture and brightness of the environment, which were the major dimensions of environmental aesthetics that people preferred in this study.

Fottler et al. (2000) points out that the setting of a hospital room can be an important part of the healing experience.

For example, a Swedish architect who designed a unique healing centre in Sweden, became convinced that the experience of interior architecture could be an important part of the healing process. They went on to assert that the quality of the healing environment must be managed carefully to ensure that the patient is satisfied with the care provided.

Light, colour, artwork and furnishing are the major dimensions of environmental aesthetics. These four aesthetic components were identified as being important to patients and have the capacity to provide messages of support and welcome.

The way in which a room is designed or laid out, the colours of the walls and the setting may also enhance patient feelings of comfort and security (Fottler et al., 2000).

5.2.2.2 Wall Colour

Use of wall colour in health care: as cultures diversify, interest in the subject of colour is deepening and its applications becoming broader. In support of colour as an environmental aesthetic healing tool, Gage (1999) says colour is more than simply a design tool; it contains values in its own right.

The participants in my research revealed that colour can be used to create illusions in the built environment and it gives an aesthetic feeling. Warm colours bring the object closer to the eye. Cool colours recede (See attached design) Whites and yellows leap forward ahead of other colours. Tall ceilings can be lowered with warm tones. Long

hallways can be shortened to the eye with warm colours at the end. Rooms can become more spacious with cool, muted colours.

An interest in the phenomenon of colour has continued throughout the twentieth century, and the use of colour for health, architecture and commercial purposes is gaining increasing momentum.

Colour is also particularly appreciated by participants as one of the features in the environment that improve the quality of hospital rooms that influence behaviour and lead to a positive frame of mind.

The participants in this study preferred light and bright colours. It is clear that the majority of participants preferred bright or cool colour. Having cool colour in the environment is linked by participants to feeling happier, excited and welcome in the environment. See figure 36 individual behaviour framework.

Researchers from the University of Washington reviewed the literature to determine what is empirically known about human responses to colour. They found that the use of hospital green to minimize the after-effects of the operating room staff was a myth (Wise and Wise, 1987).

Interior designers today introduce other colours in the finishes of the hospital environment. Studies undertaken on colour encourage the belief that colour has more than an aesthetic role to play in the successful design of our environment, but there remain many unanswered questions (Varni, Burwindle and Kurtin, 2001). The participants of this study appreciated the use of light colours, pale shades of greens and blues, soft whites, gentle creams and beiges.

Brown (1974) determined the response to colour comes first from the brain impulse and then the feeling which follows afterwards. The Human response to red colour is arousal and the response to blue is relaxation in both humans and animals.

Participants believed that if hospital rooms are painted in cool colours, such as blues or greens that would lead patients into a restful state and positive responses.

Since the psychological and physiological well-being of users in healthcare settings is extremely important in contributing to satisfaction and may improve the healing process, it is vitally important for healthcare designers to re-consider the type of wall colour in the environment that support users in hospital rooms.

Stouffer (2001), a well-known British architect, states that studies must be made to shift the argument from fashion and aesthetics into a discipline with valid measurable results confirming the effect the built environment has on a patient's outcome. Only then will the subject be taken seriously and the findings utilized.

The finding of this study reveals that adding more colours and introducing colour contrast to the hospital room was frequently recommended by participants as a possible room improvement which should be considered by designers for future design. Birren (1974) discussed the importance of cool colour for patients during their hospitalization. Birren (1974) suggests using colour in hospital as follows:

- Warm colours for convalescing patients on the way to recovery and maternity patients in need of physical relaxation
- Cool colours should be used for long-term patients and those in need of long periods of rest time
- Cool colours and low lighting should dominate emergency rooms where patients wait for examinations or tests
- Waiting rooms where families wait with anxiety need cool colours to help foster a calming effect
- Colours containing yellow-greens should be avoided because reflections from these colours cause the skin to look sallow and unhealthy with an uncomplimentary purple afterimage (Birren 1974).

The result of this study consultation suggests that interior designers should select the wall colour based on research findings and not own test. The findings support Birren (1974) discussion which indicated the use of cool colour would lead to relaxation as a result of being in a well-designed environment and this has been shown in the developed framework. See figure 36.

“Colour harmony must rest on a corresponding vibration in the human soul, and this is one of the guiding principles of our inner need” (Kandinsky, 1912 cited in Birren)

The emphasis is that designers should use bright colour rather than warm colour for design changes. Essentially, it reflects the need for new ideas about how to address the choice of wall colour in hospital rooms. With regard to the importance of interior design choice Webster and Johnson; (1999) states:

“Designer have to consider what is important for patients and supportive of their satisfaction, and the difference in their culture context. The understanding of these issues is essential as a foundation for design planning” (Webster and Johnson, 1999, p.88).

Interior designers around the world are searching for ways to humanize the design of hospital accommodation. Designing better hospital rooms would ensure that patients will have better satisfaction and heal quicker (Alvarez, 2004).

Designers have the responsibility for creating and selecting the colours which help patients to become healthier in a shorter time by increasing their satisfaction with the room design. Poorly designed rooms in hospitals with inappropriate décor further compound an already uncomfortable environment (Dijkstra, 2008).

The finding of this study shows that the presence of cool wall colour in hospital room invokes positive and happier feeling. The significant point is that light colours are positively associated with feeling relaxed and calm this explains why people prefer to have wall painted with light colour in room design.

As discussed earlier, health care professionals should consider that the presence of bright wall colour has the capacity to actively contribute to feeling of well-being by providing support for patient’s state of mind and positive emotional response; Since it is associated with feeling strong and happy.

This research finding will enable healthcare single occupancy interior designers to understand the colour and interior features the people prefer. Understanding physical environmental stimuli in hospital room will allow designers to create a people preferred environment for their satisfaction.

5.2.2.3 Artwork and Light Images

Another element of contributing physical dimensions is the artwork. The use of visual art and light images is considered as significant to public satisfaction with the

environment. Art is widely assumed to increase user satisfaction with their surroundings, as part of patient focused design in healthcare (Ulrich, 1992).

Infusing artwork into hospital room patient-focused design may foster improved moods (Ulrich, 1979, 1984). The participants in my research revealed that display of artwork and light image on the ceiling in single occupancy are important for people satisfaction with the physical setting.

These elements provide visual distractions and a source of colour in the environment. Having artwork displayed on the wall and light images on the ceiling is linked by participants to feeling happier (see developed theory) and as with cool wall colour.

“Art on the ceiling is pleasing” (Horsburgh and Zimring, 2001). Participants revealed that illuminating art murals mounted on the room ceiling over the beds could increase user satisfaction, provide a pleasing environment and create positive distraction. Illuminating art on the ceiling could draw the user’s attention away from being in hospital.

Joey Fisher, a photographer, was the first who established the idea of using ceiling art work. The idea came to life when a family member of Fisher lay on his back in hospital with only a white ceiling to view from their room bed. Fisher placed a photograph on the ceiling with a fluorescent light behind it to illuminate the art work (Derto, 2007).

In this study, participants revealed that painting is an important feature for the interior designer to consider when creating patient –focused room design. Lane (2006) cited Fletcher (2002, p.78) concerning patients satisfaction with art in hospitals. He said:

“One heart transplant patient, for example, on visiting the gallery in a hospital set up near his waiting area, said that he could step away for a moment, as he was enjoying the beauty of nature”.

Art improves the quality of a hospital room; therefore, designers must choose art that enhances the patient’s well-being and leads individual to feel positive. High quality art in healthcare draws a person’s attention to the art and creates a positive distraction. Beautiful art is calming and uplifting.

Participants suggest that displays of visual art work provide real enjoyment in hospital rooms. (Figure 37) is an example of preferred art work.



Figure 37: Artwork

“Art in healthcare settings is extremely important in contributing to the health process”. It’s believed that art potentially possesses therapeutic benefits. This indication explains how important it is to understand what type of art patients prefer and what contributes to healing (Sarajane L et al., 2008).

The findings of this study indicate that artwork is vital to healthcare users and according to the developed theory this will lead to satisfaction and well-being.

This example of Nature Artwork (Figure 37-38) in a representational artistic style is an artist’s idea of the subject that conforms as nearly as possible to the subject in its true form and contains considerable detail and fact about the subject (Mayer, 1969).

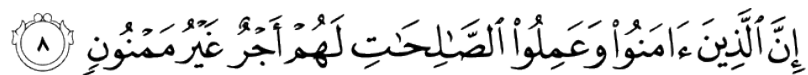


Figure 38: Preferred Artwork

Nature related artwork was more desirable to participants than abstract and surreal artwork due to Islamic religious beliefs. The book of Qur'an emphasis that animals and human portray or surreal art could be disturbing for patient who came to hospital for the purpose of healing, whereas nature artwork will remind patients of the outside world and encourage patient to heal quickly and return to normal.

Islamic Design Elements

Islamic art could make a difference for hospital user in Middle East countries, and in other countries. Islamic art contains Aesthetic value in its high quality portrayal of motifs and ornamentation (Othman, 2011). This kind of art is believed to have the aesthetic quality of beauty which fulfils the psychological needs of hospital users (Othman, 2011). See figure below 39.



Indeed, those who believe and do righteous deeds - for them is a reward uninterrupted.

Figure 39: Qu'ran Karim

Islamic culture includes symbolic and religious aspects. Those elements are ordinarily meaningful to Muslims, and should be considered during the design stage for Middle Eastern hospitals, since they have a therapeutically positive effect on the occupiers of hospital rooms. Those features have a significant effect on room occupier's spirit and reminds the Muslim of his culture (Obeidat, 2008).

Symbolic Aspects

Symbolic aspects in the Middle East include colours, shapes, and picture of Al- Masjed Al-Haram. See figure 40. On the other hand religious aspects include the inscriptions of Qur'an recitations and Athan for prayer. Those aspects are extremely important for raising Muslims spirits (Obeidat, 2008).



Figure 40: Al- Masjed Al-Haram and Ka'ba.

Shapes

Islamic art is associated with four basic shapes: circle and interweaved circles, square, the star pattern, and multisided polygons. The square shapes indicate the Ka'ba shape (The house of Allah) as shown in figure 40 (Obeidat, 2008).

Colour

There are two important colours for Muslim culture, Green and White. Green is significant colour since it was the first flag colour in an Islamic state used by the Prophet Mohamed.

The colour white suggests Peace, unity and purity. For Muslims it is considered highly important to remember their culture during difficult times, and it is believed that those colours are therapeutically positive for Muslims (Obeidat, 2008). See figure below 41.



Figure 41: The name of Prophet Mohamed in Green and White.

Pictures of Mosques

Human and animal pictures are not accepted in Islamic culture (Obeidat, 2008). On the other hand, pictures of the (Al- Masjed Al- Haram and Al-Masjed Al-Aqsa) are associated with Islamic enhance culture, and these are believed to have a therapeutic effect, which may lead the hospital room user to raise his spirits and make a speedy return to good health(Obeidat, 2008). See figure 42 below.



Figure 42: Al- Masjed Al-Haram 2

Within UK, research was conducted in Liverpool about the effects of art. That evaluation show the use of art in patient's rooms makes them feel better (Cintra, 2001). Abstract art for example contains images that make people feel positive and contributes to well-being.

One of the most important findings from this study in relation to artwork is that participants preferred colourful art which represents clear sky, river and views of sea or harbour. Another important finding is that users appreciate the presence of illuminating artwork on the ceiling.

The participants in this study preferred to have art on the ceiling. Art on the ceiling was found to provide a positive distraction. From this finding, art on ceilings should become part of hospital room design just like the electrical components of the ceiling (Durto, 2007).

Joey Fisher was the first designer to promote the idea of art on the ceiling. He believed that when a patient lay on his back in a hospital room, they may lie there for long hours,

and it is useful to have illuminating nature art work which will draw the patient's attention to the artwork for positive attention (Durto, 2007).

Healthcare professionals and interior designers must consider using illumination art work on the ceiling. Illumination art work can increase people's satisfaction with the hospital setting by holding their attention for a long time and creating a positive distraction. Designers must consider the importance of art on ceilings by applying nature work to hospital settings.

Artwork was seen by participants as something important to look at to make them feel happier and this enhances the developed framework under individual behaviour section (Figure 36).

Artwork is perceived to be a tangible indication, reminder and link to the outside world. As such, the artwork in the environment is a major part of the welcome message that people perceive in the environment.

If we create a guide (Recommendation chapter 7) for the use of art based on the finding of this study, then designers can produce excellent design, supportive design that provide positive distractions in the visual environment. Designers should choose the art type in order to bring positive feelings to the hospital room and not only to satisfy their personal taste. The benefit of nature work or traditional art will increase satisfaction for people with the environment. The use of art in hospital began in England as early as 1960, that is when hospital authorities hung art on the walls as an art gallery.

The founder of the Society of Arts in Health care believed that paintings hanging in a long sterile hallway or sculpture displayed in a bare lobby transformed the hospital into healing environments for patients (Lane, 2006). Art sends a positive message to its users and interior designers must use the art to satisfy patients to support them. Art creates a positive environment and makes people feel better.

5.2.2.4 Texture in Single Occupancy

Use of Texture in health care: interior elements offers a wide variety of interior finishes; tactile changes in the interior room surface or in finish materials create interest,

shadows, and visual variety within the hospital room (Kathy, 2004). The participants in my research revealed that texture as an element in the hospital room interior brings a richness of material contrast; see (Figure 43) an example of texture below.



Figure 43: Colour Samples

5.2.2.5 Brightness in Single Occupancy

Brightness: This is another concept, which emerged in this study, but the findings reveal that there is a consensus amongst participants as to what constitutes brightness. This indicates that brightness is a fundamental component of aesthetic environments in hospital rooms people prefer. Brightness (Figure 44-45) is a fundamental component of room design. The consultation sessions revealed that there is a consensus on the importance of brightness amongst the participants that contributes to positive feeling. Brightness in this study refers to the amount of light, and the type of wall colour which participants prefer in hospital rooms. The type of art work such as the use of paint represents nature with clear sky and sunshine. Also the use of illumination art work can increase people's satisfaction with hospital settings by holding their attention. Participants also considered the presence of plants would make the room bright and create positive feeling.



Figure 44: Brightness in Single Occupancy



Figure 45: Brightness 2

Designers should choose the art types which serve the purpose of brightening up the room. The light type is also a very important aspect of the brightness of the

environment. The effective use of light is an essential component of hospital design. Light should be used creatively both within and outside the building in order to lighten the building and create a sense of presence and beauty.

Today, with more understanding of the effects of natural light (sunlight), researchers are now focusing on the effects of artificial light to life. They seek to find its effects on life rather than only as an aid for vision. Research that was carried out indicates that constant exposure to ordinary artificial light has biological implications. Sunlight maintains a balanced light which is essential for the growth and health of living things, including man.

Natural light should be provided in hospital rooms, including staff spaces within the building as far as is practical. Studies conducted (Carpman et al., 1993) show that natural light is an essential element to facilitate healing. The use of both natural daylight and artificial light should contribute towards a high quality healing environment.

Light is an important aspect of the healing environment and has a tremendous influence on the colour of physical surroundings and people in a healthcare setting. It should be possible to adjust lighting, for example, for reading, to suit the mood and condition of the patient. Natural and artificial light sources should be designed to avoid glare and thermal gain (Carpman et al., 1993). The hospital environment should be well lit and abrupt changes in illumination should be avoided, unless specified as a clinical treatment requirement.

The design of window glazing should be such that, whether on a bright or overcast day, the provision of natural light within the hospital is maximised to light the interior to the appropriate standard specified while maintaining comfortable light and thermal conditions for the users. Artificial lighting layouts particularly, but not exclusively, should be designed to avoid the creation of a stroboscopic lighting effect.

This study has revealed that hospital rooms should be designed to bring a positive feeling and happier patients. Participants have a preference for bright rooms, full of visual interest such as wall colour, plants, flowers, art work, and Illumination art work

on the ceiling. It's very clear that those are the participants' preferences in hospital rooms.

Designers must consider participants' views about brightness as an essential point in creating room design to bring positive feeling to the hospital room and not only to satisfy their personal taste. The benefit of nature work or traditional art will increase satisfaction for people with the environment.

5.2.3 Personalization as Contribution Physical Dimensions

Bed area and personal belongings: personalization helps people to adapt to new places, regulate social interactions, enhance satisfaction with a place, and promote emotional attachment to a place. It also enhances the aesthetic look of a place and encourages creativity (Wells et al., 2007).

According to Gosling, Craik, Martin, and Pryor (2005) people also personalize their private places to reflect their interest, abilities, personalities, lifestyle and values.

Malkin (1992) suggests the use of shelves for personal memorabilia and family photos; she goes on to propose the use of a tackboard for greeting cards. Users bring to the room a favourite chair, quilt, and other things from home to personalize the room (Malkin, 1992).

Participants in my study revealed that it is important to have personal belongings, which have a great value such as a personal blanket to create a place attachment. There is also a need to personalize their bed area and create personal decoration.

“We create our own place by what we bring to it because possessions do not exist independent to us” (Steele and Brown, 1995).

Participants indicated that having family photos or something of value would increase their satisfaction and lead them to feel happier through their cognitive responses (Figure 36). Well-designed single occupancy rooms may uplift the user's spirit. Personal belongings in this study refer to user's handbag, family photo, and family gift, which may represent a special occasion or a loved one's gift.

Having the indicated elements will enhance the individual behaviour and provide enjoyment, good feeling and relaxation (Figure 36). However, in terms of environmental aesthetics, it may provide uniqueness and style.

For those who have a personal laptop, Interior designers should enhance personalization by providing a free wireless access connection within single occupancy. If a wireless network is available for the patient to use then the patient may bring their own Tablet pc (I Pad) and laptop pc with them. That has the advantage that they are already loaded with familiar music and games.

Embedding wireless network into hospital rooms is likely to be useful, and that would provide the room occupier with a link to the outside world through the internet connection available. For example, if I Pad users bring their own with them, then it would be easier for them to socialize with friends and family and keep contact with the outside world.

Personalization of single occupancy may help the user in being in a new place and increase their comfort and relaxation. Lily (2010) conducted a study about adolescents bedroom personalization. She indicated that, when adolescents moved to a new room, they didn't immediately feel at home, but personalizing their bedrooms with familiar things helped them to settle into the new place (Lily; 2010).

Another study about children's experience of hospitalization was carried out by Acton (1997), Shepely et al. (1998). They discussed personalization of the environment and they recommended providing lockable storage and shelves for children to keep their belongings (Acton, 1997; Shepley et al., 1998).

Personalization could be linked to social life and activity, for example using objects obtained from loved ones would provide social support that is important in developing place attachment (Lily, 2010).

The items may create good memories, happiness, and the security users need to settle in their room or home. The bedroom and its contents provide an opportunity to interact and relate with important people in their lives (Lily, 2010). People need to give their

space a touch of uniqueness that indicates that “this is mine; it is a reflection of self, and we are worthy and unique beings” (Marcus and Sarkissian, 1984, p. 63).

Personalization of space is the modification of or addition to the interior or exterior environment of a place by resident to give it meaning. Users personalize their spaces for expressions and emotional ties with their existing environment (Lily, 2010).

This theory applies to single occupancy users, as they may need something to remind them of the happiness and good times. On the other hand, planning and interior designers should consider the importance of personalization and its concern with their feelings and individual behaviour. The big question here is: How designers will consider personalization to improve room design? The challenge is to employ new techniques to serve user personalization in occupancy rooms. Creativity should take place to create unique ideas for single occupancy room design.

For example using a digital frame to present family photos may work well for personalization. Interior designers should provide spaces where people can put their personal items without being in the way of ‘operational needs’ such as water jugs, meal trays, tissues.

5.2.4 Flexibility and Mobility as Contribution to Physical Dimensions

Flexibility of layout is important for hospital room users. It is considered a sort of support for people who have to spend a period of time in the hospital room. The most important way is to allow users to move furniture, and having wheeled furniture will serve this demand. Participants reveal the need for mobility and the need for them to be able to move furniture around figure 46.



Figure 46: Hospital Mobile Bed

Keeping contact with nature through the window views is also critical support that provides relaxation and increases satisfaction. Ergonomics and views of nature will be discussed subsequently.



Figure 47: Reclining Chair

5.2.5 Ergonomics in Hospital Room

Ergonomics is a relationship between the design of the built environment and the users of the building or space (Kathy, 2004). There has been very little research focusing on ergonomics.

Participants in my research study preferred modern furniture, due to the comfort and colour options available. Harris, et al. (2002) discussed the importance of suitable furniture. They goes on to say:

“Furnishings might be comfortable or uncomfortable, and their layout can facilitate or interfere with comfortable body positions” (Harris, 2002)

Harris et al. (2002) goes on to say arranging furnishings so that users must turn their bodies to watch the television can cause considerable discomfort. When the physical environment isn’t suited to the physical capacity of the person to perform required task musculoskeletal disorders can result (Kathy, 2004).

To improve user satisfaction with the hospital room, the designer should consider furnishing the room with some kind of furniture that is flexible and relaxed to provide

comfort and in return that will satisfy the psychological response factor and lead to satisfaction as shown in the developed framework.



Figure 48: Ergonomics in Rooms Design

According to Kathy (2004) musculoskeletal disorders are: carpal tunnel syndrome, tendonitis, sciatica, herniated discs, and low-back pain. The effect of those conditions may have an impact on the user if the designer did not use and consider ergonomics (Figure 48) in the hospital room. In this study participants indicated that flexibility in furnishings would improve satisfaction with hospital room.

5.2.6 Views of Nature

A window is one of the important interior elements in single occupancy. It's considered important for room users. According to Nanzer (2004) individuals relate to their physical environments and begin to give meanings to certain aspects of a place which often results in developing place attachment.

The definitions of place attachment and its related concepts, such as sense of place, merges together three-elements; the physical environment, human behaviours, and

social and/or psychological processes (Stedman, 2003). The concept of place attachment also includes meanings and satisfaction with it (Lily, 2010). Verderber (1986) suggests patients prefer rooms with windows, but only if they have interesting views, preferably a view of nature.

Participants in this study preferred the view of nature to that of the city or building views. This could be a big challenge for designers to consider a way of providing views of nature in hospital design.

Ulrich (1984) suggests that hospital rooms with views of nature might reduce recovery time and provide relaxation. Ulrich (1981) also conducted laboratory research, this research indicating that views of nature produce higher level of relaxation.

In a study about window views, Verderber and Reuman (1987) concluded that window views help the occupiers develop a “perceptual and cognitive link with external environment” which may positively affects the therapeutic process and may increase satisfaction with the environment (Deviln et al., 2003).

Kaplan et al., (1972) suggest scenes of nature influence and lower stress more effectively than do scenes of the urban environment.

In this sense, participants also prefer views of nature to those of the urban environment as sources of satisfaction. A window also provides natural light into the room.

Heerwagen and Heerwagen (1986) examined the preferences of daylight to electric light in office setting and found that workers in that office preferred daylight over electric light.

The findings of this study support Heerwagen’s findings since participants in my study reveal that natural light is very important because the weather in Libya is very bright and they a used to a bright environment. And for this reason participants prefer natural light to electric light figure 49.



Figure 49: Preferred Views of Nature

5.2.7 Technology Conditions as a Contribution to Physical Dimensions

5.2.7.1 Technology infusion in healthcare setting

Technology is one of the most important elements in hospitalizing patients. The demand for technology in single occupancy rooms is a totally new finding. Bitner's (1992) theoretical framework refers to the three conditions only, which are ambient conditions, interior conditions, and architecture conditions, as important to achieve satisfaction. Technology should be infused in the healthcare setting to achieve satisfaction in the hospital room. Technology should be effectively implemented since it is significant in leading to desired behaviour.

Participants revealed that the use of internet, and mobile phone provide room occupiers with connections to the outside world and make them feel less removed from their lives outside of hospital. Feelings of being removed from the real world could be prevented by technology enhancement. For example, designers must consider providing a free wireless access connection within single occupancy. If a wireless network is available then patients can use their own Tablet pc. That has the advantage that they are already loaded with familiar music and games.

Embedding wireless network into hospital rooms is likely to be useful, and would provide room occupiers with a link to the outside world through the internet connection available. For example, for those who own an iPod tablet it would be easier for them to socialize with friends and family and keep contact with the outside world.

The researcher believes that technology enhancement could lead to positive outcomes as described by participants.

Mobile phones for example have facilities to play games, communicate with family and use Facebook or Skype.

5.2.7.2 Skype communication

If wireless network is available then Skype users will be able to make voice calls, chat, and video calls with family. Skype is free for calls to traditional phones such as mobile phone and land lines.

5.2.7.3 Video

In addition to voice calls, occupiers will be able to use video communication, which means users will be able to see one another and have face to face conversations, even from one country to another which may help those who can't afford to travel to see their loved ones. And from the above example the researcher believes that technology is an effective tool for communication between patients and their families.

Technology changes faster than we may imagine. The internet connection will also offer access to hospital users who have their favorite music, movie and photos saved on a multimedia hard drive at home.

The use of a game console is also an important finding since participants reveal that this technology will provide entertainment and pleasure which may increase satisfaction with the environment. As shown in researcher theory (Figure 36) game console use leads to positive behaviour and a feeling of excitement. Participants revealed that they will appreciate being provided with a personal computer or laptop and access to the internet to keep them linked to their family and friends, and that may reduce the strangeness of hospitalisation.

The researcher proposes that games consoles must be introduced to the healthcare setting since they are requested by participants as a new technique for providing positive distraction and entertainment for single occupancy. A comprehensive literature review search was conducted to support this finding. Previous research discusses access to healthcare information and how that may lead to satisfaction with services within

healthcare, but nothing was found about technology enhancement to increase hospital room user's satisfaction.

If hospital designers were to introduce games consoles it would be the first time ever that this technology would be used for user satisfaction. What's more is that it will convey a message to hospital room users that healthcare providers care about their satisfaction and well-being.

Games consoles can be used for the purpose of providing a distraction and for taking the pain away from the user's mind. The million pound question is, "Would the use of technology enhance the hospital room user's satisfaction"? Yes. It is time for interior designers to consider having games consoles as an essential feature of hospital room design.

5.3 *Holistic Environment*

Environmental researchers argue that the physical setting may influence users' satisfaction with the environment (Bitner, 1992). This section discusses the relationship between the single occupancy occupier and the interior setting. It also explains how human users perceive their surroundings. The perceptions of environmental users are affected by sociological needs, psychological state, and individual differences (Edward, 1990). The single occupancy interior also affects and influences human behaviour.

The states of both mental and physical stimuli affect behavioural responses to the environment (Edward, 1990).

Bitner (1992) conceptual frameworks explain planning and designing an environment and how the design leads to satisfaction and enhances the environment and user's well-being. This framework suggests that users perceive the environment in three domains and those are cognitively, emotionally, and physiologically (Bitner, 1992).

This research also asserts that participants perceive the environment in cognitive, emotional, and physiological responses. No change has been made on this part and it has been discussed in the developed theory.

5.4 *Internal Responses Contribute to Satisfaction*

As (Figure 36) shows, this discussion is concerned with individual internal responses to the physical environment. Perception of the physical environment leads to emotions, beliefs, and physiological responses which in turn affect behaviours (Mika, 2008). The internal responses are divided into physiological, cognitive, and emotional responses.

5.4.1 *Physiological Responses to Single Occupancy*

People may react purely physiologically to environmental qualities such as air quality, sound, and temperature that may cause discomfort in the environment (Mika, 2008).

Individual physical response may affect how long users stay in hospital rooms. In this research an individual's preference for a hospital is impacted by their physiological responses. There are some designs which may elicit a certain physiological response to the patient's body which would lead their preference of the facilities.

The findings confirm that flexibility and mobility will enhance physiological responses to the environment. Interior designers of hospital rooms should, during the planning phase, consider several factors relating to physiological responses including functionality, and ergonomics (Edward, 1990).

Interior environments must respond to all human functional needs to achieve both comfort and satisfaction (Edward, 1990). Users' satisfaction with the interior space is dependent on the type of furniture, material, equipment and finishes. The colours of wall paints will play a significant role in enhancing user satisfaction in hospital rooms.

Participants revealed that the interior design element leads to positive behaviour such as happy, relaxed, and excitement.

Edward (1990) indicated that, all physiological needs affect how an individual perceives and reacts toward interior space. When individual needs are appropriately met, the hospital room user will perceive the environment as successful and in satisfactory form (Edward, 1990).

Each aspect of hospital room design, which includes furnishing the space, needs to be carefully assessed in term of its compatibility with the human body. The challenge is to plan for the hospital room user activities, furnishings, and finishes that are appropriate for the occupier.

5.4.2 Cognitive Responses to Single Occupancy

Fottler et al. (2000) say that the tendency of people is to seek a point of similarity with what they have seen or experienced in their lives. A person's expectation of a new hospital room design is based on their prior experiences within an environment. In the developed framework the cognitive element is about beliefs and experience within the environment.

Cognition is the mental processing of sensory information (Mika, 2008). The more familiar a hospital room can make the experience feel, the less confusion and unhappiness a patient will experience (Fottler *et al.*, 2000).

In this study the respondent's cognitive association with either past healing or their own home design affects their preferences. For instance if in the past the patient got used to living in a blue painted room where a painting was hanging, they would associate the past event with the design of that hospital room. This would be accompanied by a feeling of satisfaction and may make them heal quickly.

They would therefore indicate a blue painted room with some art as their preferred design and décor.

5.4.3 Emotional Responses to Single Occupancy

According to Bitner (1992) internal responses may elicit emotional responses, which could influence the individual's behaviour. Emotional responses are divided into two dimensions, pleasure and arousal. Positive behaviour is normally created through pleasure and arousal (Mika, 2008). Pleasure can be achieved by aesthetically pleasing environment.

Arousal could be created through complexity, such as using poorly coordinated interior design. Hospital design and décor professionals and all healthcare providers require conditions that promote patient healing and satisfaction (Set of recommendations presented in chapter 7). Those experiences that create displeasure are viewed negatively and those that create pleasure are viewed positively.

5.5 Human (Individual) Behaviours

Binter's services cape frameworks (1992) emphasise that interior elements influence user behaviour. This research study also reveals that the physical setting could influence behaviour during hospitalization.

Individuals may respond to the physical environment with either satisfaction approach or avoidance behaviour (Binter, 1992). Approach behaviour involves positive response to the environment. In single occupancy study, users reveal that their response to cool wall colour and nature artwork is positive and that may make them feel happier being in such environment, or avoid being there if dissatisfied with the quality of the environmental surroundings.

For example, participants reveal that warm (Red, Orange, and Yellow) colour is unacceptable and this may affect their mood and feeling.

The opposite response is referred to as avoidance. For example, the user's desire not to stay in an unpleasing environment is linked to using material that affects individual responses, such as uncomfortable furniture, that will lead to physiological responses'. This theory applies to hospital room design.

A user's satisfaction could be easily achieved by linking the participant's preferred elements to environmental behaviour theory if this is not done, the user may feel unhappy and leave.

Environmental quality, such as nice artwork, Lighting, colour, and music could make a difference for user satisfaction. The positive or the negative responses from the user are determined by (physiological, cognitive, and emotional).

5.6 Design Configuration

Bitner's framework (1992) fails to discuss design configuration as an important factor which will enhance the environment. Bitner (1992) divided the physical dimensions into three categories; those are ambient conditions, interior conditions, and architecture. Ambient conditions refer to characteristics of the interior environment which affect senses (Lovelock and Wirtz, 2007).

Single occupancy interior elements should be compatible with the preferred environment to enhance user satisfaction. The ambient category includes lighting, music, smells, and scents. All these categories could create a positive response. Interior design condition: layout and functionality refers to equipment and arrangement, the size and the shape of furniture (Bitner, 1992). Functionality refers to the use of the equipment (Zeithaml et al., 1996).

In hospital rooms, designers should consider factors that facilitate the use of the environment and provide positive interaction.

Architecture condition: this refers to characteristics of the architecture such as single occupancy size, door and window location, permanent elements to which no change can be made.

In this study the design configuration is very important for achieving the desired behaviour in the healthcare setting and as shown in (Figure 36) it is linked to aesthetics and technology condition in the healthcare setting. Interior designers should understand fully the concepts of beauty and aesthetics. Aesthetic values could be understood at a universal level (Edward, 1992). Those design concepts go beyond the functionality of the space, and are associated with the specific technique to affect human senses (Hall, 1992).

Interior features should be used to serve single occupancy user needs for their satisfaction. When the occupier of the space looks at the interior objects the physical appearance of that environment causes a sensory experience in human behaviour (Edward, 1992). The designer's awareness of the concepts of beauty and aesthetics will help him to communicate his plan to the user. What's more, the designer should consider individual differences between several occupants of the environment.

Light, colour, artwork and furnishing are the main dimensions of environmental aesthetics. These four aesthetic components were identified as being important to patients and have the capacity to provide messages of support and welcome.

Design configuration can positively influence mood and behaviour. Psychological and emotional effects can be achieved through the use of the preferred interior elements.

5.7 *Desired Behaviours*

Once hospital room users feel satisfied with their surroundings and have support for their activity, that is environmental comfort (Vischer, 2007). According to Vischer (2005) environmental comfort comprises three categories: Physical comfort, functional comfort, and psychological comfort.

Physical comfort: this includes basic human needs such as hygiene and safety, which can be achieved through applying the building code and standards to the building (Vischer, 2007). Designers should understand human interaction with the environment. Research has found that the aesthetics factor had a major influence on users' judgements of their surroundings.

Functional comfort: this is linked to the ergonomics of the single occupancy room and its support for place users. Ergonomics is a relationship between the design of the built environment and the users of the building or space (Kathy, 2004).

Psychological comfort: in this study, personalization of the bed area could help people to adapt to new places, enhance satisfaction with place, and promote emotional attachment to a place. It also enhances the aesthetic look of a place and encourages creativity (Wells et al., 2007).

As shown above, physical comfort, functional comfort, and psychological comfort are affected by the designer's choice through decision-making processes. It was important to identify user preference regarding the hospital room to determine the type of elements which will support the room occupier and lead to (Satisfaction) desired behaviour.

5.8 *Summary of the Discussion*

The purpose of this research was to identify the interior décor people prefer in their hospital rooms, and to develop design guidelines and recommendations based on the research findings. These findings were also used for designing a proposed single occupancy interior in a three-dimensional model (Animation move attached).

In summary, the contributions of each of the dimensions of the physical setting were discussed. Each of the researcher developed components frameworks were defined and

discussed. The focus in this chapter was on participant preferred interior elements and on user behaviour influenced by the physical setting and then on user internal responses. The Individual behaviour design configuration, (desired behaviour) that constitutes environmental satisfaction in single hospital was explained.

The discussion of the theoretical framework in this chapter was based on research findings relating to single occupancy rooms and a developed theoretical framework. It was instructed according to the researcher's newly developed framework which addressed environmental behaviour in healthcare design.

The discussion concerning the interior and technological condition contributes new knowledge which fills the gap in Bitner's theoretical framework.

The research findings show that hospital room design plays a role in increasing user satisfaction with their surroundings. From this research, environmental aesthetic components were found to be critical for user satisfaction. Elements such as the colour of the wall, the colour of the floor, the presence of art work, plants, and window views contributed to raising patients' spirits, and according to the researcher's developed theory, enhancing participants' responses to hospital room setting through their internal responses.

The perception of the aesthetics elements could lead to physiological, emotional and cognitive responses, which may affect occupier behaviour in certain ways.

The interior designer must consider the individual's internal responses during the design stage. Well room design would lead the individual to experience positive feelings, such as happiness, excitement and relaxation. Above all if the designer succeeds in such design then the desired behaviour is achieved.

Technology, personalization, mobility and flexibility are important in facilitating user satisfaction with hospitalization in hospital rooms. The internet and mobile phone provide the room occupier with connections to the outside world and make them feel less removed from their lives outside of hospital. Technology also provides entertainment and pleasure which may increase satisfaction with the environment and provide positive distraction. According to the researcher's theory the participant will

perceive the technology condition as physiological support and that is an essential requirement for physical comfort.

Personalization helps users to adapt quickly to new environments. This study finding suggests that hospital users will adapt quickly to single occupancy if they can personalize it to own preferences. Having the indicated elements will enhance the individual's behaviour and provide enjoyment, good feeling and relaxation. However, in term of environmental aesthetics, it may provide uniqueness and style.

Mobility and flexibility was also found to be an important issue. Mobility and flexibility could be achieved by an interior designer through utilizing mobile furniture. In chapter 7 Design guidelines will be proposed for health care professionals, and some of those are presented in 3D image (Animation movie attached).

Planning and creating an appealing single occupancy room is important for increasing user satisfaction and improving the quality of healthcare design. Hospital room interior designers should address the issue of aesthetics and be aware of the kind of rooms users prefer. From this awareness, designers can create comfortable single occupancy rooms. In addition, improved hospital room design improves the quality of time that users spend in hospital.

Chapter 6: Conclusions

6.1 Introduction

In this chapter, the conclusion of this research is presented as a discussion of the findings which may lead to single occupancy satisfaction with the environment. This chapter is divided into several sections figure 50.

The purpose of this research study was to obtain validation from the general public in identifying the single occupancy interior features they prefer, which may help healthcare designers in creating the future healing room.

This study distinguishes itself from previous research by focusing on public preference in hospital single occupancy. It focuses on public preference in the design of single occupancy room.

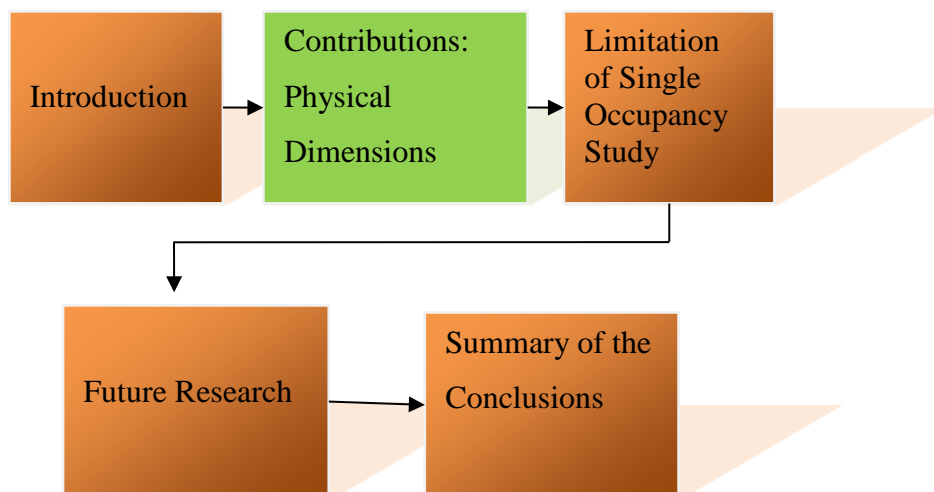


Figure 50: The Structure of the Conclusions

The results of this research were used to establish a design guide for the healthcare setting (refer to chapter seven) as there is a critical need to build on this research and ensure appropriate single occupancy. An interior design guide is available for healthcare designers.

In modern buildings, interior design features in healthcare settings have been associated with positive health outcomes such as promoting healing and well-being and reducing

length of stay in hospital, medication intake and depression. It is the researcher's belief that healing is not only about medical treatment in hospital, but also about providing a healing environment which help user healing mentally and spiritually. See figure 51 below.



Figure 51: Contribution to Well-being.

This research was not seeking to prove a relationship between preferred design and decor and improved health. However, it calls for the design of hospital rooms wanted by the ultimate customer.

There is a disconnection in most previous design studies, between designers and health professionals. High level research on either side requires both social science and design knowledge. This study has made attempts to bridge this disconnect together to make a valuable contribution.

Until recently, hospital related research has focused almost exclusively on health. There is evidence from research in non-clinical settings, such as homes, schools, and offices that the design and decor of the environment is associated with positive health outcomes. It is on these findings, of non-hospital related studies, that this study was expanded to hospital single occupancy design.

6.2 Statement of Contributions to Knowledge

6.2.1 Physical Dimensions

These sections discuss the level of satisfaction with the environment and introduce separately each element which interior designers should understand to create well-designed single hospital rooms.

Aesthetics

This refers to the experience of beauty. The argument is that, creating aesthetically pleasing environments may enhance the healing process and improve patients' well-being. The aesthetic modules identified as being particularly important to people's preferences and satisfaction with hospital single occupancy in this study include wall colour, use of artwork, texture and brightness.

Those components contribute greatly to people's satisfaction with their hospital rooms. They may help people maintain a positive frame of mind, and remain positively engaged during hospitalization. Light, colour, artwork and furnishing are the major dimensions of environmental aesthetics.

The discussion concerning environmental aesthetics revolved around people's preference and response to the use of artwork, wall colour, texture and brightness of the environment, which were the major dimensions of the environmental aesthetics that people preferred in this study.

Wall colour

This research revealed that colour can be used to create illusions in the built environment and it gives an aesthetic feeling. Warm colours bring the object closer to the eye. Cool colours recede. Whites and yellows leap forward ahead of other colours. Tall ceilings can be lowered with warm tones. Long hallways can be shortened to the eye with warm colours at the end. Rooms can become more spacious with cool, muted colours. Having cool colour in the environment is linked by participants to feeling happier, calm and welcome in the environment.

Artwork

The use of visual art and light images is considered as significant to public satisfaction with the environment. Art improves the quality of a hospital room; therefore, designers must choose art that edifies the patient's well-being. High quality art in healthcare pulls a person's attention to the art and creates a positive distraction. Beautiful art is calming and uplifting. Participants suggest that a display of visual art provides real enjoyment in hospital rooms. Colourful types of art, representing clear sky, river and views of sea or harbour are preferred by participants. Health care professionals and interior designers must consider using illumination art work on the ceiling for refreshing the environment.

Brightness

This is another concept, which emerged in this study. There is a consensus amongst participants as to what constitutes brightness. This indicates that brightness is a fundamental component of aesthetic environments in hospital room that people prefer. Brightness is a fundamental component of room design. The concept of brightness emerged in consultation sessions. The consultation sessions revealed that there is a consensus among the participants regarding the importance of brightness in hospital room.

Brightness in this study refers to the amount of light, the type of wall colour, the type of art work such as paintings representing nature with clear sky and bright day. The use of Illumination art work can increase people satisfaction with hospital setting by holding their attention. The presence of plants would also make the room bright and create positive feelings.

Personalization

Personalization of the room may help users to become accustomed to their new environment and increase their comfort and relaxation. This study suggests, having a family photo or something of value would increase their satisfaction with their hospital room and may uplift their spirit.

Personal belongings in this study refer to a user's handbag, family photo and family gift, which may represent a special occasion or loved one's gift. Having the indicated

elements will provide enjoyment, good feeling and relaxation. In terms of environmental aesthetics, it may provide uniqueness and style.

Flexibility and Mobility

Allowing users to alter their room layout may provide them with the capacity to experience control and express their interest and identity, and feel comfortable and happy.

Technology

This is one of the most important elements in relation to the hospitalized client. This study revealed that the use of internet, and mobile phone provide the room occupier with connections to the outside world and make them feel less removed from their lives outside of hospital. PlayStation also is an important finding since participants reveal that this technology will provide entertainment and pleasure which may lead to increased satisfaction with the environment.

PlayStation in hospital rooms seems to be important for the new generation and based on this research the use of this kind of technology in hospital has not been documented or used in hospital rooms yet.

The above discussion indicated that satisfaction could be achieved by considering carefully all the elements discussed in the previous section. See figure 52 below elements of satisfaction.

SINGLE OCCUPANCY ROOM



Figure 52: An Important Element for Satisfaction with the Environment

6.2.2 Theoretical Dimensions

The findings of this research reveal that a participant perceives and responds to the environment in three dimensions. Their responses are divided into physiological, cognitive, and emotional responses. Their behaviour is affected by the physical setting. Participants reveal that their perceptions of the interior elements lead them to emotional responses, beliefs, and physical responses.

In this research an individual's preferences concerning a hospital is impacted by their physiological responses. There are some designs which may elicit a certain physiological response in the patient's body which would lead their preference of the facilities.

Functionality should be considered during the design phase. Functionality in design is related to the user's physiological needs which are supported during the interior space plan (Edward, 1992).

The user's satisfaction with the interior space is dependent on the type of furniture, material; equipment and finishes which create positive responses, so if user has a comfortable setting then his response will be positive.

Since those elements influence individual behaviour. Each aspect of hospital room design, including the spacing of furniture needs to be carefully assessed in term of its compatibility with the human body.

The challenge is to plan for the hospital room user activities, furnishings, and finishes that are appropriate for the occupier. Participants perceive their surroundings through cognitive response based on their prior experiences in the environment. In this study the respondent's cognitive association with either past healing or their own home design will affect their preferences.

Emotional responses are divided into two dimensions, pleasure and arousal. Pleasure can be achieved by aesthetically pleasing surroundings. Arousal could be created through complexity, such as using a poor room interior design.

Hospital design and décor professionals and all healthcare providers require conditions that promote patient healing and satisfaction. Those experiences that create displeasure are viewed negatively and those that create pleasure are viewed positively. This would mean patient preference is significantly affected by some emotional factors associated with the hospital and not direct personal preference.

Participants in this study made it clear that their preferred element is linked to the physical environmental features; these include an aesthetically pleasing environment which includes art in healthcare, colour in healthcare, brightness in healthcare and texture in healthcare. Another environmental finding which influences user behaviour positively is personalization, technology, mobility and flexibility.

6.3 *Limitation of Single Occupancy Study*

This research aim was to enable healthcare single occupancy interior designers to gain an insight into the colours and interior features people prefer, and identify features that can also be used in other configurations such as designing double rooms and wards in hospitals. Understanding physical environmental stimuli in hospital rooms will allow designers to create a people preferred environment for their satisfaction. Conducting research about hospital single occupancy rooms is a challenge, and many may have affected this research

The methodological considerations in this research were vital. The researcher considered several approaches to gain insight into the interior elements people prefer. Eventually, a new methodological technique was employed and this is discussed below.

6.3.1 *Consultation and ArchiCAD*

The consultation was conducted to assist the researcher in discovering, defining, and developing a plan to act upon problems which occur in the target area (client's environment) and are in need of change. The collaborative approach is highly appropriate for individual consultation (Kurpius, 1976).

The qualitative research consultation can be described as a discussion between researcher and participant with a purpose and a structure determined by the researcher. The goal was to obtain descriptions of various aspects of hospital room design. The researcher kept the purpose of this study in mind to ensure that the aim would be achieved.

The researcher utilized a CAD program (three dimension computer aided design) on a laptop to help in capturing accurately the participants' views as they suggested and described their preferred room design. From this feedback the researcher continued to manipulate the 3D image on the computer until all respondent's preferences were captured.

6.3.2 Sample Size

The initial plan was to engage with at least 25-30 participants in this research study which was conducted in Tripoli Medical Centre-Libya, between 21 January 2011 to 28 February. However, due to the war in Libya the numbers of respondents who took part in this study were limited to 18 due to safety considerations concerning the researcher and participant. The impact of the war may have an effect on this study.

The researcher was arrested and interrogated by a Libyan secret agent, and asked questions (who are you working for and who you are doing this for, etc.). This without doubt affected this study by limiting the number of respondents interviewed to 18 rather than the planned 25. Meeting with Libyan people and discussing an issue related to a hospital run by the then authority in Libya could be very risky. Therefore the researcher could not continue consulting participants during the uprising.

In practice, the researcher was banned from inviting people into Tripoli Medical Centre and from asking further questions for the purpose of research or any other issue.

Trochim (2006) says in clinical practice, we might use clients who are available to us as our participants and circumstances made an early completion of data collection essential in this study.

6.3.3 The Effect of War in Libya

The researcher was born in Tripoli-Libya and he has a small family, consisting of sisters and brother living in Tripoli. During the war the researcher has been through a very difficult time being away from his sisters and brother and not being able to support them during such a difficult time, when it was the researcher's responsibility to look after them. During the war the researcher worked very hard to complete this journey with his family in mind, it was not easy, and that may have had an effect on this research study.

6.3.4 Interior Effect

This research was not seeking to prove a relationship between preferred design and decor and improved health. However, it calls for the design of hospital rooms according to the preferences of the customers who will use them.

6.4 *Future Research*

The researcher hopes that the findings in relation to hospital rooms will encourage further research in exploring hospital facilities, which may enhance the user's satisfaction and well-being in the healthcare environment. The study of hospital facilities could provide the interior designer more insightful recommendations and design guidelines for future design based on client's needs.

Since this research study is the first ever conducted on preferred single occupancy interior design and décor features in hospital, there is significant need for repetition of this study on a bigger scale.

This research study could be expanded from a single research study into a global study. A global study will bring benefit to hospital users. Conducting research in several countries would require interior designers who are capable of designing the environment. This will in fact be valuable for patients and may bring success to the Health care environment.

6.5 *Summary of the Conclusions*

The use of new techniques such as CAD consultation and co-present collaboration mode in the academic field, proved to be effective techniques. The outcome of using CAD was accurate in terms of gathering data. The approach involves making use of CAD (Computer Aided design) software, which helps respondents to accurately map their preferences, in order to arrive at an understanding and interpretation of how people create and maintain their social worlds.

The result of this research study shows how important it is to collaborate with participants in designing their preferred room design.

Since identifying the interior elements in hospital rooms is extremely important in contributing to the user's satisfaction with the healthcare environment, it is vitally important that designers create designs that enhance user satisfaction with healthcare. A poorly designed room may convey a message to its user that the hospital did not care about their satisfaction.

Because room design contributes to enrichment of the user's surroundings, the researcher believes it is important to understand what kind of interior design the general public prefers.

The outcome of this study suggest healthcare designers could help both users and healthcare professionals, merely by understanding what they prefer in hospital rooms which can provide positive distraction, entertainment , links to the outside world and enrichment. And with the growing number of single occupancy, it is the researcher's belief that it is time to validate hospital room design for the benefit of all.

Chapter 7: Recommendations

7.1 Introduction

In the next section the meaning of design guidelines is clearly explained. The components of the hospital room and En-suite bathroom as well as design details of each element were also explained. This description will help designer in creation of the future design; all this knowledge was built on the finding of this research, which reflect the user's preference. This chapter is divided into two sections: section one is about the interior furnishing and the section two is about the layout and the three –dimensional design of single occupancy.

7.2 Design Guidelines

The guidelines of this study will be both written recommendations and visual images of single occupancy interior design. Some of the material will be presented on DVD. The basic design principles will be incorporated into this study recommendation. Those are proportion, scale, harmony, rhythm variety, contrast, and balance. An outline of those basic standards was given in this chapter.

Designing a single occupancy room required a consultation with the user of the environment. In this research study the necessary information was gathered during the consultation session that contributed to the important information.

7.3 Three – Dimensional Design of Hospital Rooms

A three –dimensional design of single occupancy rooms was created in this chapter, which was guided by the findings of this research. User preferences are incorporated along with the findings into a set of recommendations for interior designers to use for the future design of hospital rooms.

The recommendation and guidelines are described for interior designers to use as follows. This list of design elements will be combined together to create room design for user activities. Design theory of the physical environment served as a foundation for the design. This chapter is divided into the following sections under the headings:

- Interior furnishing
- Lighting
- Colour
- Wall texture
- Window views
- Artwork and painting
- Layout arrangement of single occupancy
- Personalization

7.4 *Interior Furnishing*

This section discusses single occupancy interior furnishing which is suited for the user of this room. The room furnishing must support the user during hospitalization. The first impression of a hospital room is very significant.

Utilizing old furniture (style, material, and colour) may not satisfy its user and may suggest to the user that the healthcare designer does not care about the occupier, and this can lead the user to lack of satisfaction with the environment.

7.5 *Furniture in Single Occupancy*

Light and bright furnishing interior is preferred in hospital room

- Sofa
- Bed
- Chest of drawers.
- Bedside table
- Locker
- Television
- Bookcase
- Small dining table
- Shelves for photographs

7.6 *Technology in Single Occupancy*

- TV Point
- Video Channel
- PlayStation
- PC Laptop Computer
- Smoke Detector

7.6.1 Lighting

Light is a very important element which enhances user satisfaction within the environment. Full attention must be given to the type and level of light.

The general recommendation for single occupancy lighting is as follows:

- Sunlight maintains a balanced light which is essential for the growth and health of living things, including man.
- Natural light should be provided in hospital rooms
- Significant amount of nature or daylight should be provided for user visual tasks.
- Windows is are a fundamental element in providing natural light
- Glare or shiny surface must be avoided

7.6.2 Colour

Colour should be used in single occupancy based on deep understanding of its message to the user of the environment. The general recommendation for single occupancy colour is as follows:

- A Cool colour (Blue, Light Green, and White) is favoured colour because those colours create room brightness.
- A warm colour such as orange, red or yellow seems to be not the preferred colour for hospital room.
- Overall a Blue green is favoured colour for background and wall colour.

If the interior designer understands the warm and cool colours and their effects then the healthcare designer should begin to create a design with the needs of the user in mind.

7.6.3 Wall Texture

The use of Texture in interior design offers a wide variety of interior finishes as follows:

- Textural changes in the finishing materials to create interesting finish.
- Shadows and visual variety within the hospital room also comes from the use of wall texture.
- Wall texture brings a richness of material and colour contrast.

7.6.4 Window Views

- Must have a curtain or blinds to avoid direct sun light.
- Garden, nature views are preferred if possible.

- If the view from the window is a building or a car park, then an interior solution should be made by the interior designer, for instance, using digital views which can be seen from the inside and not from the outside.



Figure 53: View 1



Figure 54: View 2



Figure 55: View 3

7.6.5 Painting and Art Display

Visual art and light images are considered significant to the user's satisfaction with the environment. According to Cintra (2001) Art is very important for two reasons:

- (a) Can easily improve the excellence of the environment
- (b) Art can improve the emotional feeling of well-being through supporting social interaction (Hesham, 2006)

General recommendation for single occupancy hospital room art is as follows:

- Using Illuminating art murals mounted on the room ceiling over the beds could increase user satisfaction and provide pleasing environment and create positive distraction
- Illuminating art on the ceiling could draw user attention away from thinking of being in hospital
- Nature artwork painting is the user's favourite, since it provides a source of entertainment and engagement
- Abstract, ambiguous (surreal) is not their preferred art in hospital setting and should be avoided when creating patient –focused room design, but Nature is the preferred art

- Colourful type of art which represents clear sky, river and views of sea or harbor is user's favourite

7.6.6 Layout Arrangement of Single Occupancy

The following issues should be considered when designing single occupancy hospital rooms:

- Places for reading, writing
- Comfortable place for patient visitors
- Place for playing games within the room
- Place for watching t v and relaxing
- Place for internet and laptop computer
- Light arrangement
- Wall colour
- Artwork and painting
- Floor colour and material
- Accessories

7.7 Personalization as Design Element

The Interior designer has to focus on modification to improve the room design, which may promote healing and increase user satisfaction.

Design modifications may include new ideas that may serve personalization in hospital room. It is the researcher's view that single occupancy should provide some supporting facility that could be used to present user identity and the identity of the place in that room. Design interventions to personalize hospital rooms may have an impact on user satisfaction, and well-being.

7.7.1 Personalization User Requirements

- Room to reflect the user's personality
- Room furniture needs to convey user's territory and personality
- Nature or garden views
- Providing an area or shelves for personal belongings and family photos by utilizing digital frame
- Providing space for greeting cards will also provide a place attachment

7.7.2 En-Suite Bathroom

7.7.2.1 User Requirements

- Toilet and shower facility
- Wash hand basin
- Cross top taps
- Thermostatic mixer control
- Towel rail
- Soap dish and dispenser
- Hand dryer
- Bin
- Toothbrush holder
- Mirror and shaving point
- Wall light
- Sink unit

7.7.3 Transferability of Research Findings to other Cultural

This refers to the possibility that what was found in one environmental context by qualitative research is applicable to another environmental context.

In this research study, people may react toward the environment by sifting impressions through their cultural background (Farbstein and Kantrowity, 1978).

What we consider to be beautiful is dependent on environmental user knowledge; tastes, culture background and interior design may affect users' minds and senses (Dilani, 2001).

From culture perspectives, interior designer should consider cultural aspects which must be recognized, for instance, it is important to know how patients are using hospital rooms, and how the design can assist its user. For example, in Libya, there are many cultural aspects that should be carefully considered during the planning stage for hospital rooms design; such as:

Culture Islamic Design Elements

- Islamic art contains aesthetic value in its high quality portrayal of motifs and ornamentation (Othman, 2011). This kind of art is believed to have the aesthetic quality of beauty which fulfils the psychological needs of hospital users (Othman, 2011). See figure below

- Islamic culture includes symbolic and religious aspects. These elements are ordinarily meaningful to Muslims since they have a therapeutically positive effect on the occupiers of hospital rooms (Obeidat, 2008).
- Ka'ba Shapes: Islamic art is associated with four basic shapes: circle and interweaved circles, square, the star pattern, and multisided polygons. The square shapes indicate the Ka'ba shape (The house of Allah) (Obeidat, 2008).
- Colour: There are two important colours for Muslim culture, green and white. For Muslims it is considered highly important to remember their culture during difficult times, and it is believed that those colours are therapeutically positive for Muslims (Obeidat, 2008).
- Symbolic Aspects: Symbolic aspects in the Middle East include colours, shapes, and pictures of Al- Masjed Al-Haram. On the other hand, religious aspects include the inscriptions of Qur'an recitations and Athan for prayer. These aspects are extremely important for raising Muslims' spirits and must be considered during the design stage (Obeidat, 2008).
- Pictures of Mosques: Al- Masjed (Al- Haram) and Al-Masjed (Al-Aqsa) are associated with Islamic Enhance Culture and these are believed to have a therapeutic effect (Obeidat, 2008).

Cultural differences between Libya, and others country, such as UK and USA are unknown and further research is needed to make a cross cultural comparisons, since my research study was the first of its kind ever conducted that focused on public preference in hospital single room occupancy.

List of References

- Aas, D. 1975. Observing Environmental Behavior: The Behavior Setting. In W. Michelson (Ed.), Behavioral Research Methods in Environmental Design. Community Development Series, Volume *. Dowden, Hutchinson and Ross, Inc. USA. 280-300.
- Akin, O. 1978. How Do Architects Design?(ed). Artificial Intelligence and Pattern Recognition in Computer Aided Design, North Holland Publishing Company.
- Allderston P; Green S. and Niggins J. P.T., 2003. Cochrane Reviewers' Handbook 4.2.1. In: The Cochrane Library, Issue 1, 2004. John Wiley and Sons, Ltd, Chichester, UK.
- Amaratunga, D; Baldry, D; Sarshear, M. and Newton, R. 2002. Quantitative and Qualitative Research in the Built Environment: Application of mixed Research Approach. In Emerald Journals, Work Study, Volume 51, Number1, 2002. 17-31.
- Altimier, L. B., 2004. "Healing Environments: for Patients and Providers." New-born & Infant Nursing Reviews 4(2): 89-92.
- Alvarez, L., 2004. The Healing Begins with a Design. The New York Times. September 20, 2004.P.12.
- Ampt, A. Harris, P and Maxwell, M., 2008. The Health Impacts of the Design of Hospital Facilities on Patient Recovery and Wellbeing, and Staff Wellbeing: A Review of the Literature. Centre for Primary Health Care and Equity, Sydney: University of New South Wales.
- Akin, O. 1986. Psychology of Architectural Design Pion, London.
- Acton, L. P., Aoun, A., Dennis, E., Hall, J. H., Fitzback, S., Komiske, B., et al. 1997. Children's Health Design: Designing for Family-Centered Care. Journal of Healthcare Design, 9, 129-135.
- Baxter, L.A., 1991. Content Analysis. In: Montgomery, B.M., Duck, S. (Eds.), Studying Interpersonal Interaction. The Guilford Press, New York, London, pp. 239-254.
- Braun, V. 2005a. In search of (better) Female Sexual Pleasure: Female Genital 'Cosmetic' Surgery. Sexualities, 8(4), 407-424.

- Braun, V., & Wilkinson, S. 2003. Liability or Asset? Women talk about the Vagina. *Psychology of Women Section Review*, 5(2), 28-42.
- Berry, Rita S. Y., 1999. Collecting Data by In-Depth Interviewing. Paper Presented at the British Educational Research Association Annual Conference, University of Sussex at Brighton, September 2 – 5.
- Biley, F.C., 1996. *Hospitals: Healing Environments*. London: Elsevier, 2, p 110–115.
- Bilda, Z. and Demirkan, H. 2003. An Insight On Designers' Sketching Activities in Traditional Versus Digital Media. *Design Studies*, 24, 27-50.
- Bilda, Z, Demirkan, H, and Erkip F 2000 Traditional Versus Digital Design Medium: A Case Study In The Interior Design Studio Unpublished Manuscript, Bilkent University, Bilkent, Ankara, Turkey available on the World Wide Web: www.bilkent.edu.tr/zafer
- Birren, F. 1978. *Colour and Human Response*. P119-125. John Wiley&Sons. Inc.
- Brill, M. and Villecco, M. 1981. "Environmental Design Research: Concepts, Methods, and Values" (Design Arts Programme of the National Endowment for the Arts, Washington D.C.).
- Brink, H. 1996. *Fundamentals of Research Methodology for Health Care Professionals*. Cape Town: Juta.
- Birren, F., 1961. *Colour Psychology and Colour Therapy*. New York: Doubleday.
- Bitner, M. J. 1992 *Servicescapes: The Impact of Physical Surroundings on Customers and Employees*. *Journal of Marketing* 56(2), 57-71.
- Beyer H; and Holtzblatt K. 1998. *Contextual Design, Defining Customer-Centred Systems*. Academic Press, A Harcourt Science, and Technology Company. USA.
- Birren, F., 1979. Human Response to Colour And Light. *Hospitals*, 53(14), pp. 93-96.
- Boyce, Carolyn & NEALE, Palena, 2006. *Conducting In-Depth Interviews: A Guide for Designing and Conducting In-Depth Interviews for Evaluation Input* .Available from http://www.pathfind.org/site/DocServer/m_e_tool_series_indepth_interviews.pdf (Accessed on 19 May 2010).
- Boyatzis, R. E. 1998. *Transforming Qualitative Information: Thematic Analysis And Code Development*. Thousand Oaks, CA: Sage.

- Brown, B., 1974. *New Mind, New Body: New Directions For The Mind*. New York: Harper and Row.
- Carpman, J. R., and Grant, M. A. 1993. *Design that Cares: Planning Health Facilities for Patients And Visitors*, 2nd Ed. Chicago: American Hospital Publishing.
- Chaney, P. S., 1973. Decor Reflects Environmental Psychology. *Hospitals*, 47 (11), pp. 60–66.
- Chiovitti, R. F. & Piran, N. 2003. Rigour and Grounded Theory Research. *Journal of Advanced Nursing*, 44(4): 427-435.
- Cohen, D. and Crabtree, B., 2006. Qualitative Research Guidelines Project. Available from: <http://www.qualres.org/HomeUnst-3630.html> (Accessed 19 May 2010).
- Concise Oxford English Dictionary. 11th ed., 2008. Oxford: Oxford University press. Softcopy.
- Cortvriend, P., 2005. The effect of Healthcare Environment on Patients and Staff. www.mbs.ac.uk Visited 01.05.2010.
- Craft, N. B. and Bobrow, M. L., 1969. New Design Enhances Nursing Efficiency. *Hospital Progress*, Oct.
- Cintra, M. 2001. Art in Healthcare Buildings; Is any Art Good Art? In A (Ed.) *Design and Health-The Therapeutic Benefits of Design* (p. 303-310). Stockholm : AB Svensk BYGGTJANST.
- Dalke, H., Camgoz, N., Bright, K., Cook, G., Littlefair, P., and Loe, D. 2003. Research with Users: Colour Design and Lighting for Public Transport, Prison and Healthcare Environments. An International Conference on Inclusive Design for Society and Business 25-28 March 2003, Royal College of Art, London. UK.
- Darley, John M. and Daniel T. Gilbert 1985, Social Psychological Aspects of Environmental Psychology, in *Handbook of Social Psychology*, 3rd ed. Vol. II, Gardner Lindzey and Elliot Aronson, eds. New York: Random House, Inc. 949-91
- Davidson, A. W., Teicher, M. H., and Bar- yam, Y., 1997. Role of Environmental Complexity In the Well-Being of the Elderly. *Complexity & Chaos in Nursing*, Summer, pp. 5–12.
- Denzin, N. K. and Lincoln, Y. S, 1998. *Strategies of Qualitative Inquiry*. Thousand Oaks: Sage Publications

- Devlin, A. S. and Arneill, A. B; 2003. Healthcare Environments and Patient Outcome: A Review of Literature. *Environment and Behaviour*, Vol. 35 No. 5, 665-694.
- Dijkstra, K., 2006. Physical Environmental Stimuli that turn Healthcare Facilities into Healing Environments Through Psychologically Mediated Effects. *Journal of Advanced Nursing*, 56 (2), pp. 166–181.
- Dijkstra, K., 2009. Understanding Healing Environments: Effects of Physical Environmental Stimuli on Patients' Health and Well-Being.
- Dijkstra, K., Pieterse P, M. E., Pruyn, A. T. H., 2008. Individual Differences In Reactions Towards Colour In Simulated Healthcare Environments: The Role of Stimulus Screening Ability. *Journal of Environmental Psychology*, 28 (3), pp. 268–277.
- Donnerbauer, R; 2004. Gutes Lichtals Wohlfühl factor. *Der Facility Manager: Gebäude und Anlagen besser planen, bauen, bewirtschaften*. November 2004. 11. Jahagang, Heft11: 40-42.
- Durto, A., 2007. Light Image Therapy in the Health Care Environment. USA: Thesis Presented To The Faculty of the Technology, East Tennessee State University.
- Dilani, A; 1999. Design and Care in Hospital Planning. Karolinska Institute: Institute for Psychosocial Factors and Health, Public Health and Treatment Research, Design and Stockholm.
- Dilani, A; 2001. Psychosocially Supportive Design-Scandinavian Healthcare design. In Dilani, A; Ed, Design and Health: The Therapeutic Benefits of Design, The Result of the 2nd International Conference on Design and Health Organized by the Karolinska Institute in Stockholm. AB Svensk Byggtjänst. Stockholm. 31-37.
- Devlin A, Arneill A ; 2003. Health Care Environments and Patient Outcomes: A review of the literature. *Environment and Behaviour*, 35(5): 665-694.
- Easterby- Smith, M., Thorpe, R. and Lowe, A., 1991. Management Research. London: SAGE.
- Edward T. Hall, 1990. The Hidden Dimension (Garden City, NJ: Doubleday & Co., pp. 122-125.
- Edwards, Kenneth. 1979. The Environment inside the Hospital. *Practitioner* 222(1332):746-51

- Ericsson, K A and Simon, H A 1993. *Protocol Analysis: Verbal Reports as Data* MIT Press, Cambridge, MA
- Eyles, J., 1989. Qualitative Method. IN: R. Johnston, D. Gregory, and D. SMITH, eds. *The Dictionary of Human Geography*. Oxford: Blackwell. pp. 380-382.
- Ely, M., Vinz, R., Downing, M., & Anzul, M. 1997. *On Writing Qualitative Research: Living by Words*. London: Routledge/Falmer.
- Faber, B., 1969. *Light, Colour And Environment*. New York: Van Nostrand Reinhold.
- Farbestein, J. and Kantrowity, M., 1978. *People in Place: Experiencing, using, and Changing the Built Environment*. Prentice-Hall, Inc. New Jersey. USA.
- Fischi, G., 2005. *A Psychosocial Approach to Architectural Design: A Methodological Study*. Publisher Details Not Known.
- Fottler, M. D. et al, 2000. Creating A Healing Environment: The Importance of The Service Setting in the New Consumer Oriented Healthcare System. *Journal of Healthcare Managment*, 45, pp. 91–106.
- Fletcher. T. T. 2002. *A Touch of Reality*. Baton Rouge, LA: Par Excellence.
- Gage J. 1999. *Colour and Meaning: Art. Science and Symbolism*. London: Thames and Hudson.
- Geimer-Flanders, Jone, 2009. *Creating a Healing Environment: Rationale and Research Overview*. Available from: http://www.ccjm.org/content/76/Suppl_2/S66.full 2009. (Accessed 10 May 2010).
- Gosling, S. D., Craik, K. H., Martin, N. R., & Pryor, M. R. 2005. The Personal Living Space Cue Inventory: An Analysis and Evaluation. *Environment and Behavior*, 37, 683-705. doi: 10.1177/0013916504274011
- Guba, E. & Lincoln, Y. 1985. *Effective Evaluation: Improving the Usefulness of Evaluation Results Through Responses and Naturalist Approaches*, San Francisco: Jossey-Bass.
- Guerin, D. and Martin, C., 2001. *The Interior Design Profession's Body of Knowledge!; Its Definition and Documentation*. Original Report prepared for the Association of registered Interior Designers of Ontario (ARIDO). Toronto: ARIDO. Hernandez, A. (1997). *Pedagogy, Democr.*

- Harris, Paul B. et al., 2002. A Place to Heal: Environmental Sources of Satisfaction among Hospital Patients. *Journal of Applied Social Psychology*, 32(6), pp. 1276-1299.
- Harrell. Hutt, and James C. Anderson, 1980 Path Analysis of Buyer Behaviour under Conditions of Crowding. *Journal of Marketing Research*, 17 February 45-51.
- Hall, .1990. The Hidden Dimension (Garden City, NJ: Doubleday & Co., pp.7-10.
- Heerwagaen, J. H., & Orians, G. H. 1986. Adaptations to Windowlessness: A Study of the use of Visual Décor in Windowed and Windowless Offices. *Environment and Behaviours*, 18, (5), 623-639.
- Heron, J. and REASON, P., 2001. The Practice of Co-Operative Inquiry: Research 'with'
- Hosking, S. and Haggard, L., 1999. Healing the Hospital Environmnet: Design, Management and Maintenance of Healthcare Premises. E and FN Spon. China.
- Horsburgh, C. R., J., Zimring, C. 2001. The Architect as Patient: Hospital Designer Perceptions of Healthcare Design. In A. Dilani (Ed.) *Design &Health- The Therapeutic Benefits of Design* (pp. 163-167). Stockholm: AB Svensk Byggtjanst.
- Hussey, J. and Hussey, R., 1997. *Business Research*. London: Macmillan Press Ltd.
- Hesse-Biber, S. N., & Leavy, P. (Eds.) 2006. *Emergent Methods In Social Research*. Thousand Oaks, CA: SAGE.
- Hesham, E. 2006. Design for Effective and Affective Medical Environment. Thesis, (PhD). University of Duisburg.
- Intille, S. S., Tapia, E. M. Rondoni, J. Beaudin, J Kukla, C., Agerwal, S., Bao, L. and Larson, K. 2003. Tools for Studying Behaviour and Technology In Natural Setting. In proceeding pf UBICMP 2003: Ubiquitous Computing, vol. LNCS 2864, A. K. Dey, A. Schmidt, and J. F. McCarthy Eds. Berlin Heidelberg: Springer' 2003.157-174.
- Kelle, U. 2004. Computer-Assisted Analysis of Qualitative Data. In U. Flick, E. von Kardorff & I. Steinke (Eds.), *A Companion to Qualitative Research* (pp. 276-283). London: Sage.
- Kurpius, D. J., & Brubaker, J. C. 1976. *Psycho Educational Consultation: Definition--Functions--Preparation*. Indiana: LAB for Educational Development, H. L. Smith

- Centre for Research in Education, Room 180, Indiana University, Bloomington, Indiana 47401.
- Kerfoot, K. A. and Nevmenn, T. N., 1992. Creating a Healing Environment: The Nurse Manager's Challenge. *Nursing Economics*, 10 (6), pp. 423-425.
- Lane, M. R., 2006. Art in Health Care: A New Paradigm for Holistic Nursing Practice. *Journal of Holistic Nursing*. 24(70-75).
- Lily C. F., 2010 Personalization of Bedrooms by Urban Adolescents in Botswana: Expressing Identity and Developing Place Attachment. A (Ph-D) Dissertation. Oregon State University.
- LAWSON , B., AND PHIRI, M., 2000. Hospital design: room for improvement. *Health Service Journal*, 20 (110), pp. 24–26.
- Leather P, Beale D, Santos A et al. 2003. Outcomes of Environmental Appraisal of Different Hospital Waiting Areas. *Environment & Behaviour*, **35**: 842-69.
- Lovelock, C., & Wirtz, J. 2007. *Services Marketing: People, Technology, Strategy*. Pearson International.
- Mayer, R. 1969. *A Dictionary of Art terms and Techniques*. New York: Crowell Publications.
- Mackinlay, A. C., 1997. Event Studies in Economics and Finances. *Journal of Economic Literature*, XXXV, 13 - 39.
- Mahnke, F. H., 1996. *Colour, Environment and Human Responses*. New York: Van Nostrand Reinhold.
- Malkin, J; 2002. *Medical and Dental Space Planning: A Comprehensive Guide to Design, Equipment, and Clinical Procedures*. John Wiley and sons, New York . USA.
- Maikin, J., 1992. *Medical and Dental Space Planning*. New York: Van Norstand Reinhold.
- Malkin, J. 1992. *Hospital Interior Architecture: Creating Healing Environments for Special Patient Populations*. New York: Van Nostrand Reinhold.
- Marx, J. 2000. A Proposal for Alternative Methods for Teaching Digital Design' *Automation in Construction*. Vol 9. 19–35

- Malkin, J; 2002. Medical and Dental Space Planning: A Comprehensive Guide to Design, Equipment, and Clinical Procedures. John Wiley and Sons, New York. USA.
- Mehrabian, Albert; and Russel, James A. 1974. An Approach to Environmental Psychology. The MIT Press: Cambridge.
- Malkin, J., 2008. A Visual Reference for Evidence-Based Design. Concord, CA: Centre for Health Design.
- Mayring, P, 2000. Qualitative Content Analysis. Forum Qualitative Social for Schung / Forum: Qualitative Social Research [On-line Journal], 1(2). Available from: <http://qualitative-research.net/fqs/fqs-e/2-00inhalt-e.htm> (Accessed 18 May 2010)
- Mazuch . , 2003. Truly Therapeutic Environments Help Close Wounds and Repair the Body Physically, Mentally and Emotionally.
- Mazuch, R. and Stephen, R. 2005. Creating Healing Environments: Humanistic Architecture and Therapeutic Design.
- Marcus, C. C., & Sarkissian, W. 1984. Housing as if People Mattered: Site Design Guidelines for Medium-Density Family Housing. London: University of California Press.
- Miles, M., 1992. Asclepius and The Muses: Arts in The Hospital Environment. International Journal of Arts in Medicine, 1, pp. 26–29.
- Miles, M. B. Huberman, A. M. 1994 Qualitative Data Analysis: An Expanded Sourcebook (2nd ed) Thousand Okas, CA:Sage.
- Mika. B., 2008 Managing the Physical Environment In Service Organization: Bachelor Thesis, Lulea University of technology.
- Moore, J. S., 1963. All Rooms are Private in this Compact Nursing Unit Plan: Hospitals. J.A.H.A., 37 (Oct. 1), pp. 35-
- Moore, J., 2000. Designed to Heal: Architecture of Swedish Clinics is about more than Medicine. Modern Healthcare, 30 (47), Pp. 32–34.
- Myers, Michael D., 1997. "Critical Ethnography in Information Systems," In Information Systems and Qualitative Research. London: Chapman and Hall.
- Monz, A. And Monz, J; 2001. Design and Therapie: Raumgestaltung in Krankenhausern, Kliniken, Sanatorien. Verlagsanstalt Alexander Koch GmbH. Leinfrlden-Echterdingen. Germany.

- Morse, J. M. (1989). Strategies for Sampling. In J. M. Morse (Ed) *Qualitative nursing research: A contemporary dialogue* (pp. 117-131). Rockville, MD: Aspen.
- Mcnamara JF 1994. *Surveys and Experiments In Education Research*. Lancaster, PA: Technomic Publishing Company Inc.
- Munhall, P.L. & Boyd, C.O. 1993. *Nursing Research: A Qualitative Perspective*. Second Edition. New York: National League for Nursing Press.
- Olds, A.R., Daniel, P. A. 1987. *Child Health Care Facilities*. Bethesda, MD: Association for the Care of Children's Health.
- Oberascher, L. 2001. *Colour and Light: Orientation and Well-Being in Health Care Facilities*.
- Othman, R., 2011. The Importance of Islamic Art in Mosque Interior. *Sciverse Science Direct*. 105-109.
- Obeidat, M. 2008. *Designing Alzheimer's Special Care Facilities that Includes Consideration for the Islamic Culture*. Ph-D Dissertation. Texas Tech University.
- Nasar, J. L., 1994. Environment and Behavior. *Urban Design Aesthetics: The Evaluative Qualities of Buildings*, 26 (3), Pp. 377-401.
- Nasar, J. L. 1997. New Developments in Aesthetics for Urban Design. In G.T. Moore & R.W. Marans (Eds.), *Advances In Environment, Behavior, and Design* (Pp.149-194). New York: Plenum Press.
- Nader, R. 1989. Keynote address. *Journal of Healthcare Design*, 1: 3-5. (Proceedings from the first Annual National Symposium on Health Care Interior Design Held in April 29 –May 1, 1988. Carlsbad, California, USA).
- Nasar, J.L., 1988. Perception, Cognition and Evaluation of Urban Places. IN: J. L. NASAR, ed. *Environmental Aesthetics: Theory, Research and Application*. New York: Cambridge.
- Newell, A and Simon, H A. 1972. *Human Problem Solving* Prentice Hall, NJ
- Nightingale, F. 1969. *Note on Nursing: What is it, and what is it not*. New York, NY: Dover.
- Nueman, W. L., 2003. *Social Research Methods: Qualitative and Quantitative Approaches*. Boston: Alyn and Bacon.
- Nanzer, B. 2004. Measuring Sense of Place: A Scale for Michigan. *Administrative Theory & Praxis*, 26, 362-382.

- Kilmer, R. and Kilmer, W., 1992. *Designing Interior*. Thomson Learning, Inc. USA.
- Kaplan, S., & Wendt, J. S. 1972. Preference and the visual environment: Complexity and some Alternatives. *Proceedings of the EDRA Conference, UCLA*, 1, 681-685.
- Kathy. F. Montgomery 2004. *Understanding the Relationship between the Design of the Workplace Environment* Master Thesis. Texas University.
- Palmer, J. B. and Nash, F., 1997. *Taking Shape: Environmental Art in Healthcare*. IN: C. KAYE AND T. BLEE, ed. *The Arts In Healthcare: A Palette Of Possibilities*. London: Jessica Kingsley.
- Patton, M.Q. 1990. *Qualitative Evaluation and Research Methods*, Second Edition. Sage Publications, Inc. USA
- Patton, M. Q. 1990. *Qualitative Evaluation and Research Methods* (2nd ed.). Newbury Park, CA: Sage.
- Phiri, Michael, 2004. *One Patient One Room – Theory & Practice: An Evaluation of the Leeds Nuffield Hospital. A Study Report*. University of Sheffield
- Phiri, M. 2006. *Does the Physical Environment Affect Staff and Patient Health Outcomes?* London: Department of Health, UK.
- Pierman, B. C., ed., 1976. *Colour in the Healthcare Environment*. *Proceedings of a Special Workshop Held at the National Bureau of Standards, 16 November 1976*. Washington, DC: US Government Printing Office.
- Perin, G., 1973. *With Man in Mind: An Interdisciplinary Prospectus for Environmental Design*. Heffernan Press Inc. USA
- Ryan, G. W., & Bernard, H. R. 2000. *Data Management and Analysis Methods*. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of Qualitative Research* (2nd ed., pp. 769-802). Thousand Oaks, CA: Sage.
- Rubin, H. R., Owens, A. J., & Golden, G. 1998. *Status Report: An Investigation to Determine Whether the Built Environment Affects Patients Medical Outcomes*. Martinez, CA: The Center of Healthcare Design.
- Reason, P and Bradbury, H., 2001. *Rather than 'on' People* (Eds.), *Handbook of Action Research: Participative Inquiry and Practice* (pp.179-188). Thousand Oaks, CA:
- Rengel, R., 2003. *Shaping Interior Space*. New York; Fairchild Publications.
- Rosemary, G., 2004. *Impact of The Built Environment. Practice Development in Healthcare*, 3 (3), pp. 182–185.

- Russell and Geraldine Pratt 1980, A Description of the Affective Quality Attributed to Environments, *Journal of Personality and Social Psychology*, 38 (2), 311-22.
- Russell and Lawrence M. Ward 1982. *Environmental Psychology Annual Review of Psychology*, 651-88.
- Sarajane, L., Eisen, Roger S. Ulrich, M. Shepley, James W. Varni and Sandra Sherman, 2008. The Stress-Reducing Effects of Art in Pediatric Health Care: Art Preferences of Healthy Children and Hospitalized Children. 12; 173.
- Sarajane, L., 2006. The Healing Effects of Art in Pediatric. Healthcare: Art preferences of Healthy Children and Hospitalized Children. Ph-d Texas A&M University.
- Sekaran, U., 2000. *Research Methods for Business*, New York: John Wiley & Sons.
- Seale C, Silverman D.1997. Ensuring Rigour in Qualitative Research. *Public Health*. 7: 379-384.
- Silverman D., 1994. *Interpreting Qualitative Data*. London: Sage.
- Sherman, S. A., Varni, J. W., Ulrich, R. S., & Malcarne, V. L. 2005b. Post-Occupancy Evaluation of Healing Gardens in a Pediatric Cancer Centre. *Landscape and Urban Planning*, 73, 167-183.
- Shepley, M., Bryant, C., and Frohman, B., 1995. Validating a Building Prototype: A Post-Occupancy Evaluation of a Women's Medical Centre. *Journal of Interior Design*, 21 (2), pp. 15–29.
- Shepley, M. M., Fournier, M. A., & McDougal, K. W. 1998. *Healthcare Environments for Children and their Families*. Dubuque, IA: Association for the Care of Children's Health.
- Sission, T. R. C; 1978. Some Realationshipe of Colour and Light to Patient Care. In B.C. Pierman, *Colour in Healthcare Environment: Proceedings of a Special Workshop Held at the National Bureau of Standards*. Gaitherburg, Maryland, November 16, 1976. U.S. Government Printing Office. Washington. 19-24.
- Stouffer, J., 2001. Integrating Human Cantered Design Principals in Progressive Health Facilities. In A. Dilani (Ed.) *Design& Health –The Therapeutic Benefits of Design* (pp. 285-292).
- Stenner, P. 1993. Discoursing Jealousy. In E. Burman & I. Parker (Eds.), *Discourse Analytic Research: Repertoires and Readings of Texts in Action* (pp. 94-132). London: Routledge.

- Streubert Speziale, H. J. (2003). A practical guide for sharing qualitative research result. In H. J. Streubert Spezial and D. R. Carpenter (Eds) *Qualitative research in nursing: Advancing the human perspective* (3rd ed., pp. 323-336). Philadelphia.
- Steele, J. R., & Brown, J. D. 1995. Adolescent Room Cultures: Studying Media in the Context of everyday Life. *Journal of Youth and Adolescence*, 24, 551-576.
- Stedman, R. C. 2003. Is it Really Just a Social Construction?: The Contribution of the Physical Environment to Sense Of Place. *Society and Natural Resources*, 16, 671–685.
- Scher, P., 2001. The Exeter Evaluation, a Basis for Hospital Design and Art in the Millennium. In A. Dilani (Ed) *Design and Health the Therapeutic Benefits of Design, the Result of The 2nd International Conference on Design and Health* Organized by the Karolinska Institute in Stockholm. 317-327.
- Swan, J. E., Richardson, L. D., and Hutton, J. D., 2003. Do Appealing Hospital Rooms Increase Patient Evaluations of Physicians, Nurses and Hospital Services? *Health Care Management Review*, 28 (3), 254.
- The Economist, 1997. *The Economist Numbers Guide: The Essentials of Business Numeracy*, London: Profile Books.
- Torrice, A. F., 1989. Colour for Healing. *Journal of Health Care Design*, 1, Pp. 35-43.
- Trochim, William M.K., 2006. *Research Methods: Knowledge Base*. Available From: <http://Www.Socialresearchmethods.Net/Kb/Sampnon.Php> (Accessed 13 May 2010)
- Ussher, J. M., & Mooney-Somers, J. 2000. Negotiating Desire and Sexual Subjectivity: Narratives Of Young Lesbian Avengers. *Sexualities*, 3(2), 183-2000.
- Ulrich, R. S. 1981. Natural versus Urban Scenes: Some Psychophysiological Effects. *Environment & Behavior*, 13, 523-556.
- Ulrich, R. S. 1983. Aesthetic and Affective Response to Natural Environments. I. Altman & J. F. Wohlwill. (Eds.), *Behaviour and the Natural Environment*. Newyork: Plenum.
- Ulrich, R. S., 1984. View through a Window May Influence Recovery from Surgery. *Science*, 224, Pp. 224–421
- Ulrich, R. S. 1991a. Pre-Symposium Workshop: A Theory of Supportive Design for Healthcare Facilities. *Journal of Healthcare Interior Design*, 9, 3-7.

- Ulrich, R. S. 1991b. Effects of Interior Design on Wellness: Theory and Recent Scientific Research. *Journal of Healthcare Interior Design*, 3, 97-109.
- Ulrich, R.S. 1993. Biophobia, and Natural Landscapes. In S.R. Kellert & E. Wilson (Eds.), *The Biophilia Hypothesis* (Pp.73-137). Washington, DC: Island Press.
- Ulrich, R. S. 1999. Effects of Gardens on Health Outcomes: Theory and Research. In C. C. Marcus & M. Barnes (Eds.), *Healing Gardens: Therapeutic Benefits and Design Recommendations* (Pp. 27-86). New York: John Wiley.
- Ulrich, R., Simons, R. F. and Miles, M. A., 2003. Effects of Environmental Stimulations and Television on Blood Donor Stress. *Journal of Architectural Planning and Research*, 20 (1), Pp. 38–47.
- Ulrich, R. S. 2004. *The Role of The Physical Environment in the Hospital of the 21st Century: A Once-In-A-Lifetime Opportunity*. New York: Robert Wood Johnson Foundation.
- Varni, J. W., Burwinkle, M. A., Kurtin, P. S. 2001 An Evaluation of the Healing Environment: Children's Convalescent Hospital, San Diego. In A. Dilani(Ed) *Design And Health- The Therapeutic Benefits of Design* (Pp. 135-140). Stockholm: AB Svensk Byggtjanst.
- Valkla-Poldma, T .2007. *An Investigation Of Learning and Teaching Processes in Interior Design Class: Interpretive and Contextual Inquiry*. Thesis (Ph-D) .McGill University. Department of integrated Studies in Education.
- Venolia, C., 1988. *Healing Environments: Your Guide to Indoor Well-Being*. Berkeley: Celestial Arts.
- Vaikla, T., 2003. *An Investigation of Learning and Teaching Processes in An Interior Design Class: An Interpretive And Contextual Inquiry*. McGill University.
- Van Someren, M W, Barnard, Y F And Sandberg, J A C .1994. *The think Aloud Method: A Practical Guide to Modelling Cognitive Processes* Academic Press, London.
- Vaikla-Poldma, T.1999. *Gender, Design and Education: The Politics of Voice*. McGill University, Montreal: Author.
- Verderber, S. F., 1983. *Windowless and Human Behaviour in the Hospital Rehabilitation Environment*. Thesis. University of Michigan.

- Verderber, S. 1986. Dimensions of Person-Window Transactions in the Hospital Environment. *Environment and Behaviour*, 18, 450-466
- Verderber, S., & Reuman, D. 1987. Windows, Views and Health Status in Hospital Therapeutic Environments. *Journal of Architectural and Planning Research*, 4, 120-133.
- Villecco, M. & Birll, M. 1981. Environmental Design Research: Concept, Methods and Values. NY: Publishing Centre for Resources. New York. Hospital Environment. *Environment and Behaviour*. 18 (4): 450-466.
- Vischer, J.C. 2005. Space Meets Status: Designing Workplace Performance. Oxford, UK: Taylor And Francis Routledge.
- Vischer, J.C. 2007. The Effects of the Physical Environment on Job Performance: Towards Theoretical Model of Workspace Stress
- Wells-Thorpe, J., 2001. Design for Enhanced Recovery. IN A.DILANI Ed. Design & Health-The Therapeutic Benefits of Design. Stockholm: AB Svensk Byggtjanst , P.311-315.
- Webser, P. D., & Johnson, B. H., 1999. Collaborative Design Planning. Institute for Family-Centered Care. Maryland. USA.
- Wise, B.K. and Wise, J.A., 1987, February. The Human Factors of Colour in Environmental Design: A Critical Review. Draft Final Report, NASA Grant no. NCC 2-404). Seattle, Washington: University of Washington, Department of Psychology.
- Wells, M. M., Thelen, L., & Ruark, J. 2007. Workspace Personalization and Organizational Culture: Does Your Workspace Reflect You Or Your Company? *Environment and Behaviour*, 39, 616-634.
- Zeull C, Herkness J, Hoffmeyer-Zlotnik J.H.P, 1995, Text Analysis and Computers, (Contributions To The Text Analysis And Computers Conference, September 18-21, Mannheim, Germany), Zentrum für Umfragen, Methoden and Analysen (ZUMA)
- Zafer B. Halime D, 2002 An Insight on Designers' Sketching Activities in Traditional Versus Digital Media. Department of Interior Architecture And Environmental Design, Bilkent University, 06533, Bilkent, Ankara, Turkey

Zeithaml, V.A., & Bitner, M. J. & Gemler, D. D. 1996 Services Marketing: Integrating Customer Focus across the Firm. The McGraw Hill Companies.

Appendix A: Consultation Schedule

A contribution to preferred single occupancy interior design and décor features in hospitals

Consultation Guide for general public

1. Introduction: Self introduction, name and general affiliation

2. Purpose of consultation.

To discover the preferences of the general public in relation to interior design and decor in single occupancy rooms in hospitals.

By interior design I mean how rooms look in terms of shape and features.

By the term décor I mean the decoration and furnishing of a room.

3. Consultation (description session)

In this section we want to find out your preference for design and each interior element (décor) in a hospital room

Research question #1:

What do you think would be the components /characteristics of good décor and interior in single occupancy design?

This question attempts to gain initial understanding of which interior elements each participant prefers.

Research question #2:

What are the reasons that participants give for their décor and interior preferences?

Participants will have the opportunity to answer this question in an open-ended manner.

Further detailed questions:

The following elements will be discussed.

In this section we want to find out your preference for each interior element (décor) in a hospital room.

Imagine being hospitalized in a hospital room – the scenario is that you have to stay for treatment for about four days. Next, you will be asked to describe what type of interior features you would prefer in that room. The researcher will ask participants to describe what might be their optimum room, and will render the room using 3D CAD design software to represent the room on a laptop computer as we speak. The researcher will ask you about the aesthetic aspects, for example: ‘What sort of wall colour would you like?’ I will use the 3D CAD design in order to design, and discuss your unique environment.

Colour

What type of wall colour would you like in your room?’ how does that colour make you feel? And pattern?

What is your preferred floor colour in a hospital room? What kind of material? For example, wood, carpet, lino.

Furnishing

What kind of furniture do you prefer in your hospital room?’

What about the quality of the finish (Material)?

How do you feel about this material?

What colour would you prefer the furnishings to be?

In which part of the room would you place the bed?

Where would be your sitting area in the room?

Where would you place different furnishings in the room?

Lighting

‘What type of light do you prefer?’; ‘Tell me about the location of lights

Why did you choose this kind of light?’ Where would you like it (Location)?

How would this make you feel?

Please describe your favourite artificial light location, Type, and Intensity?

What natural lighting intensity would you prefer?

If there was a choice between natural or artificial lighting, what lighting would you prefer?

Art

Could you describe the preferred type of art, which you would like to have in your room?

Why did you choose this?

Where would you place it in the hospital room?

Does this kind of artwork have any special meaning for you?

Window Views

Would you want to have a window in your hospital room?

Window, what kind of window views do you prefer, and why? How would you describe them?

Any specific material (wood and plastic are materials. The surface coating – eg varnish or paint – is the finish) for example, wood, Plastic?

On which side of the room would you prefer the window to be?

Curtain

What type of curtain do you prefer? Tell me about the colour, pattern, and material

Plants

Would you want a plant in your hospital room?

What type of plant would you want in your hospital room?

If you want a plant in your room, in which part of the room would you place the plant?

Door

What type of door material would you like? Would you like to have a doorbell?

What about a central control panel?

Music

We all like music. Tell me about your favourite music?

Computer, Internet and Phone

How do you contact your family? Do you contact them online? If yes, then what type of computer would you like? I mean which kind, not which model?

Laptop or Desktop?

How about having a telephone?

TV

Do you follow the news or any other program?

En-suite

What type of facility do you need?

Finally is there any other element you think is important and I should know?

Thank you for your collaboration!

Appendix B: Consent Form

Organisation: Research Committee of the Health and Social Care School,
Bournemouth University

Title of Study: PhD

Aim of Study: The main purpose of this study is to identify the interior design and décor features preferred by the general public for single occupancy hospital rooms.

Researcher' Position: Student

Researcher's Name: Moamer Gashoot 07796692120. Or email
MoamerGashoot@bournmeouth.ac.uk

Consent:

I.....give consent to have an audio recording of myself while being interviewed or consulted by the researcher.

I understand that excerpts of the taped interview will be given in the researcher's final dissertation paper. The taped interview will not be shared by anybody other than the researcher and the researcher's supervisor of the study.

All excerpts of the taped interview given in the final dissertation paper will remain anonymous and I will not be identified

I am not required to answer any specific questions if I chose not to and have the option to withdraw at any time from the interview or study and the tape destroyed

The researcher will retain the taped interview until completion of the study, a period of 36months and then it will be destroyed. The tape will be destroyed in accordance with Data Protection and the Records Management Code of Practice (DH, March, 2006).

The procedure and intended use of the taped interview have been explained to me by the researcher

I understand that I will not be identified in the study and any information given will be anonymous

I.....agree to take part in the study

Signature of Participant.....Date.....

Signature of Researcher.....Date.....

Appendix C: Participant Information Sheet

Title of the project:

A contribution to preferred Interior Design and Décor Features of Single Occupancy Room in hospital

You are invited to take part in a research study. Before you decide to take part it is important that you understand why the research is being done and what it will involve. To facilitate this, the following questions and answers are designed for you. Please take time to read the following information carefully and discuss it with others if you wish. If there is anything that is not clear or you would like more information about it, please feel free to ask me.

Thank you in advance for taking the time to read this information sheet.

What is the purpose of the study?

The purpose of this study is to identify the interior design and décor features of hospital single occupancy rooms that are preferred by the general public.

This will help architects and interior designers to improve hospital room design.

Why have I been chosen?

The researcher hopes to learn more about the kind of interior design that a participant would prefer in a hospital room. Participant involvement in this study may give the designer a better understanding of public preferences concerning single occupancy interior features which may inform the future of room design. You were chosen because your opinion and views are vital and will help in the future understanding of hospital room design.

Do I have to take part?

It is not compulsory to participate in this study. It is up to you to decide whether or not to take part. If you decide to take part, you are still free to withdraw at any time and without giving a reason.

If I want to take part what do I have to do?

If you choose to take part, you will be given this information sheet to keep and you will be asked to sign a consent form. The researcher will then conduct a consultation session with you and he will use a laptop computer and 3D design software to design your preferred room. The session will take the form of a discussion between you and the researcher. The researcher will ask you questions about aesthetic aspects and your preferred room design, for example “What wall colour would you like?”. As he guides the program into the 3D single occupancy room, he will encourage you to give him your view and suggestion about the plan. In your presence and with your approval, the researcher will relocate furniture and experiment with different room layouts and colour schemes to make sure that he correctly captures your preferred interior design and décor features of the hospital single occupancy room.

There aren't any right or wrong answers – the researcher wants to hear about your opinions. The discussion should take about one and half hours at the longest.

What if I change my mind during the research? What can I do?

You can decide to withdraw from this study at any time without penalty and without giving a reason. Just simply inform the researcher that you would like to stop.

What will happen if I take part?

You will be asked to participate in a consultation session; the consultation will begin by a brief explanation of the aim and the goal of this study. The researcher will explain the purpose of this study, which is to enable interior designers and health professionals to better understand what people prefer in hospital single occupancy rooms and that it will secure findings which validate what type of interior design and décor people prefer in single occupancy settings. The researcher will guide the consultation, as he designs the 3D single occupancy room using a computer. He will encourage you to give him your view and suggestion about the room plan. He will relocate furniture and experiment with different room layouts and colour schemes depending on your opinion. The consultation session will take the form of informal discussion of a number of design scenarios including the subjects of colour, wall colour, lighting (natural and artificial), and window, view of nature, art work, and furniture.

What are the possible disadvantages?

There are not any reasonably foreseeable discomforts, disadvantages and risks involved in participating in this study.

What are the possible benefits of taking part?

Whilst there are no immediate benefits for those people participating in this research, you will have the experience of seeing your favourite single occupancy on 3D CAD image that may become the proposed future of hospital single occupancy for your family, friends and the general public. It is hoped that this work will be used by designers to improve the healthcare system for the benefit of everyone who will use the facilities. Your preferred room design will be sent to you (in 3D image) at the end of this research as a reward for participating in the consultation session.

What are the possible risks and disadvantages of taking part?

It is not expected that your participation in the research would cause any harm. All the views and suggestions you will give through the discussion about the interior elements of hospital room are not sensitive. No difficult, sensitive, or upsetting question will be asked during the session. Participant safety, dignity, and well-being will be ensured at all times during the consultation.

However, if for any reason you become concerned about the room design discussion, you are offered the option of discontinuing to participate without giving any reason.

What if something goes wrong?

If you have any concerns related to your knowledge about interior design or computer skills, then don't worry, the researcher will guide the program into the 3D single occupancy room. He will encourage you to give him your view and suggestion about the plan. However, if by any chance you feel any distress as result of having given your view and suggestion, you can contact the researcher supervisory team, who will help address your concerns and give the necessary information and explanation. If you have any concerns about the way this research is being conducted, please contact the researcher, Moamer Gashoot. If you are not satisfied with the response you receive or would rather to talk to supervisory team, please contact Dr Francis Biley, Dr Carol

Bond, or Dr Chris Little. They will be ready to respond to any of your concerns. Please see the contact details below.

What will happen to the results of the research study?

The results of the study will contribute to the future understanding of hospital room design. It is hoped that this work will be used by designers to improve the healthcare system for the benefit of everyone who will use the facilities.

In addition, the research results will be made available for other researchers and designers (in complete anonymity) through journal publications and conference presentations. Your preferred room design will be sent to you (as 3D image) at the end of this research as reward for participating in the consultation session.

Will my taking part in this study be kept confidential?

Yes, all excerpts of the consultation session that you give will remain anonymous and will be kept confidential and in a safe place. No individuals will be identified in this research.

Who has reviewed the study?

This study will be reviewed and approved by the Research Committee of the School of the Health and Social Care, Bournemouth University, and my supervisory team who are in charge of this PhD research.

Contact details for further information

If you require any further information please contact me on this number:

Researcher: Moamer Gashoot

Tel: 07796692120 Or Email: MoamerGashoot@bournemouth.ac.uk

Supervisors of the project:

Dr Francis Biley

Centre for Qualitative Research, School of Health & Social Care

Royal London House, Christchurch Road,

Bournemouth, BH1 3LT, UK

Tel: 01202 962214

Email: fbiley@bournemouth.ac.uk

Dr Chris Little

Centre for Qualitative Research School of Health & Social Care

Royal London House, Christchurch Road,

Bournemouth, BH1 3LT, UK

Tel: 01202 67342

Email: CLittle@bournemouth.ac.uk

Dr Carol Bond

CeWQoL – the Centre for Wellbeing and Quality of Life

Royal London House, Christchurch Road,

Bournemouth, BH1 3LT, UK

Tel: 01202 961748

Email: cbond@bournemouth.ac.uk

Thank you for taking part in the Study

You will be given a copy of the information sheet and consent form to keep.

Appendix D: Poster



To participate in a consultation session on hospital single occupancy interior and décor preference, for my PhD research in the School of Health and social care at Bournemouth University. The consultation session will take place during the daytime at Tripoli Medical Centre Setting. And it should last for about an hour. Each participant is required to describe his favourite room décor and interior setting. And give reasons for the choice contribution.

If you are 18 years old or above, please contact, Moamer Gashoot:

mgashoot@bournemouth.ac.uk / tel: 0914774052

Your support to this research is greatly appreciated. The result will contribute to designing healing environments for people who are hospitalized in hospital single occupancy.

Arabic Language Poster



الدعوة مفتوحة و موجهة لكم للمشاركة في حلقة استشارية عن التصميم الداخلي لحجرة نزيل
بمستشفى طبي وهذه

المشاركة مهمة وخاصة بتحضير درجة الدكتوراة في مجال الصحة العامة.

الحلقة الاستشارية في الصباح في مستشفى طرابلس الطبي وتستمر لمدة ساعة من الوقت.

اذا كنت ترغب في المشاركة فكل ما عليك هو تقديم وصف شامل لمواصفات حجرة نزيل بمستشفى
وتذكر سبب اختيارك لهذه الموصفات. شروط المشاركة "يجب على المتقدم ان يفوق عمرة السن
التامنة عشر و ان يكون قد قضى فترة زمنية كنزيل بمستشفى لمدة تتجاوز الثلاثة ايام.

للمشاركة يجب الاتصال بالارقام التالية 0914774052

او المراسلة عن الاميل السلف الذكر. mgashoot@Bournemouth.ac.uk



مشاركتم مهمة جدا للرقى بالعناية الصحية لتحسين مستوى المباني الصحية.

شكرا جزيلاً لتعاونكم معنا

Appendix E: Thematic Analysis Art Category



Category	Themes	Sub-Themes	Finding
Artwork And light image	<p>Researcher: Could you please describe your preferred type of art, which you may like to have in your hospital room?</p> <p>Participant: I would like to have some type of painting that presents nature, trees and clear sky. It would be nice if these were oil paintings (Entisar, 32).</p> <p>Researcher: Why did you choose this kind of artwork?</p> <p>Participant: I prefer this kind of art work because I like the garden, trees and nature. It is very colourful, uplifting and makes me feel happy and welcome, and this creates a distraction (Entisar, 32.)</p> <p>Researcher: Where would you place it in the hospital room?</p> <p>Participant: I would like to see the artwork opposite to my bed, 'cause it will change a boring room into an interesting one and it will be nicer to have more than one painting in the room (Osama, 28).</p> <p>Researcher: Does this kind of artwork have any special meaning to you?</p> <p>Participant: Yes, it's good. When I look at art work, I feel happiness and excitement, so I like the art because it will add a pleasant touch to this room. It makes me feel comfortable; I enjoy it (Sallah, 39).</p>	<p>View of green landscape</p> <p>Linked to the aesthetic appeal of the environment, and it is linked to providing colour and source of entertainment, and uplifting</p> <p>Entertainment and excitements more comfortable and enjoyable</p> <p>Brightness in the room and entertainment</p>	  <p>Nature art work</p> <p>Aesthetic appeal Excitement</p>  <p>Brightness</p> 

Appendix F: Light Image

Light image	<p>Researcher: Tell me about other types of art which you may think are important for you?</p> <p>Participant: Some sculptures will be nice, only animals due to my religious believe, but it will make the room lighter and nice (Norry, 24).</p> <p>Participant: Art is nice, can you design a painting on the ceiling?</p> <p>Researcher: Why on the ceiling?</p> <p>Participant: So when I lay on the bed I will be able to enjoy it the most.</p> <p>Researcher: Oh, good idea.</p>	 <p>Linked to room design Aesthetic appeal and Brightness</p> <p>Aesthetic appeal</p>  <p>Illuminated artwork</p>	<p>Environmental Aesthetics and Brightness</p> <p>Environmental Aesthetics</p> <p>Light Image</p>
-------------	--	---	---

	Nature artwork
	Entertainment
	Brightness
	Aesthetical quality
	Illuminated art


Appendix G: Wall Colour

Categories	Theme	Sub-Theme	Finding
Wall Colour	<p>Researcher: What type of wall colour would you like in your room?</p> <p>Participant: I like bright colours, such as; natural, beige, and cream, but I prefer a cream wall colour.</p> <p>Researcher: Why did you select this colour? And how it make you feel?</p> <p>Participant: It is a bright colour, and I think it makes me feel happier and may make the room bright too (Mabrok, 22).</p> <p>Researcher: Would you like to refer to something that is important to you?</p> <p>Participant: Yes, you did not ask me about the different finish in the room, I would like to say that texture is my favourite interior finish.</p> <p>Researcher: Why do you like it?</p> <p>Participant: Texture will provide a unique affect and the light will reflect which will create happiness (Ayah, 19).</p>	<p>It's linked to cool colour scheme And Brightness</p> <p>←</p> <p>It's linked to user's excitement</p> <p>←</p> <p>Linked to texture finish</p>	<p>Cool colour, such as blue, green, natural, and calm</p> <p>Brightness</p>  <p>Texture</p>
Floor colour	<p>Researcher: What is your preferred floor colour?</p> <p>Participant: I prefer a moderate cream colour.</p> <p>Researcher: What about the floor material?</p> <p>Participant: Marble is nice and will make the room look good and it is easier to keep clean (Tarigk, 35).</p>	<p>Brightness</p> <p>Linked to Aesthetical quality and excitement</p> <p>←</p>	<p>Brightness</p> 


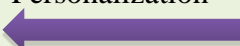
Appendix H: Furniture Colour

Categories	Theme	Sub-theme	Finding
Furniture colour	<p>Research: What kind of furniture do you prefer in a hospital room?</p> <p>Participant: Computer desk, patient's bed, visitor's sofa, bookcase, and a wardrobe.</p> <p>Researcher: What about the material?</p> <p>Participant: I prefer wood, more specific zane wood or mahogany.</p> <p>Researcher: What about the colour?</p> <p>Participant: Light, similar to nature (Ali, 49.)</p> <p>Researcher: Where would you place the bed?</p> <p>Participant: I would like to have the window on the left hand side of my bed and I think the furniture should have wheels for mobility.</p> <p>Researcher: Where would be your sitting area?</p> <p>Participant: It would be nice if you locate it near the window so I can enjoy the view and the light from nature (Osama, 28).</p> <p>Researcher: Do you have any thing that is important to you that we haven't discussed?</p> <p>Participant: Yes, I would like to have my family photos around me, my books, and personal belongings.</p> <p>Researcher: Why?</p> <p>Participant: The room would feel like home and I enjoy having my personal things around me (Zohair, 32).</p>	Linked to modern furniture	Modern furniture
		First glass material	
		Brightness and Nature colour	Brightness and bright colour
		Mobility and flexibility	Mobility and flexibility
		Lined to window views and the need for brightness	Nature light
		Linked to personalization of the room	Personalization
		Personalization	

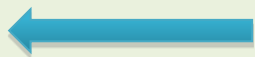
Appendix I: Curtain Colour

Categories	Theme	Sub-theme	Finding
Curtain colour	<p>Researcher: Why did you select this colour? And how does it make you feel?</p> <p>Participant: It's a bright colour, and I think it makes me feel happier and may make the room bright too (Tarigk, 35).</p>	<p>Linked to aesthetical quality of the room and pleasant of the environment</p> <p>Happier and relaxation</p>	<p>Environmental Aesthetics</p> 



Appendix J: Furniture Style

Categories	Theme	Sub-theme	Finding
Furniture	<p>Researcher: Where would you place the bed?</p> <p>Participant: I would like to have the window on the left hand side of my bed and I think the furniture should have wheels for mobility (Mohamed, 19).</p>	<p></p> <p>Linked to personalization of the room</p> <p>Personalization</p> <p></p>	Personalization

Appendix K: Computer, Internet and Phone

Categories	Theme	Sub-theme	Finding
Computer, internet, and phone	<p>Researcher: How do you communicate with your family? Participant: I use a mobile phone. Researcher: How about landline? Participant: No, unless I have to. Researcher: Do you contact your family online? Participant: Yes, I use my laptop to communicate with all my family and I it will be appreciated to provide a pc which allowed us to access the internet. Researcher: What kind of pc do you prefer to use? Participant: Laptop so I can use the internet in my Bed (Germawi, 45).</p>	Use Mobile phone	<p>Technology</p> <p>Technology</p> <p>Technology flexibility</p>
		Linked to Flexibility	
		 <p>Laptop is linked to communication and access internet</p> <p>Flexibility</p>	

Appendix L: TV and Music

Categories	Theme	Sub-theme	Finding
TV and Music	<p>Researcher: Do you follow the news or any programs on TV? Participant: Yes, Football and sport. Researcher: Why do you follow it? Participant: I enjoy watching the TV; I would also like to have a PlayStation in my room. Researcher: PlayStation, that's interesting, Why PlayStation? Participant: I always play games, therefore I need one as it will make me happy and keep me busy (Abd-allaha, 21).</p> <p>Researcher: Tell me about your favourite music? Participant: Classic music. Researcher: Why this kind of music and how do you listen to it? Participant: This kind of music makes me feel relaxed and calm and I always use my Ipod</p>	<p> Linked to entertainment</p> <p>Linked to calm atmosphere</p> <p> Lined to relaxation and the use of technology</p>	<p>Technology Provide happiness</p> <p>Technology and entertainment</p>

Appendix M: School of Health and Social Care Ethical Approval



School of Health and Social Care

Research Governance Review Group

Feedback to student and supervisors

Student: Moamer Gashoot

Title: Preferred single occupancy interior design and décor features in hospital

Review of revised proposal submitted in light of original report dated 05.08.10.

Report prepared by: Martin Hind

Date: 12.10.10.

Dear Moamer

Thank you for re-submitting your study to the research governance review group (RG2).

Your submission has now met the requirements of the review in the following ways;

- Reference to NHS involvement has now been fully removed thus negating the need for an external NHS REC review.
- Your sampling intentions are better defined.
- The revised participant information sheet has been updated accordingly
- The quality of the proposal text has improved when compared to the original submission.

Points (a) and (b) of your original report (05.08.10) were not re-reviewed as these were advisory only, these points were/are a matter between you and your supervisory team.

Your study is now fully approved to proceed, subject to securing written permission to access your intended institution (i.e. Tripoli Medical Centre).

On behalf of the research governance review group I wish you all the very best with your studies.

A handwritten signature in black ink, appearing to read 'Eloise Carr'.

Eloise Carr
Chair of School Postgraduate Committee

Appendix N: Tripoli Medical Center Approval One

اللجان
في كل مكان



لاديمقراطية
بدون مؤتمرات شعبية

الجمهورية العربية الليبية الشعبية الاشتراكية اعطى

مركز طرابلس الطبي

24141
39.6
5.14
10.6
2.16
الموافق 7/10/378 د

الرقم الاشاري :

التاريخ / /

الموافق 7/10/378 د

الأخ الطالب / معمر محمد قشوط

جامعة بورنمته البريطانية

بعد التحية،،،،

بالإشارة للطلب المقدم منكم بتاريخ: 2010/10/04 ف بشأن طلبكم الموافقة على إجراء الدراسة الميدانية المتعلقة بالتصميم الداخلي لمكونات مبانى مركز طرابلس الطبي .

عليه نفيذكم بالموافقة على إجراء الدراسة الميدانية وجمع البيانات المتعلقة بالتصميم الداخلي لمكونات مبانى مركز طرابلس الطبي .



الدكتور م/م

محمد عبد السلام عجاج

مدير إدارة الشؤون الهندسية

أملين لكم كامل النجاح والتوفيق

والسلام عليكم

صورة ٣

الأخ/ الأمين العام بالمركز

الأخوة/ رؤساء الأقسام الهندسية


الملتف الجورى العام

د. د. عجاج حليم

هاتف : 4623701 عین زارة - طرابلس

Appendix O: Tripoli Medical Center Approval Two

ALBURAQ BUREAU
Legal Translation
Embamed Elmegarif St. near of Aljaazer Square
Tel/Fax: 214448513 Mob: +218914603008-926478548 E-mail: alburag700@yahoo.com


E-mail: alburag700@yahoo.com

مكتب البراق
للمترجمة القانونية
شارع إسماعيل القرني - بالقرب من ميدان الجزائر
هاتف/فاكس: 214448513 نقال: +218914603008-926478548

Translation from Arabic
07/10/2010

Great Socialist People's Libyan Arab Jamahiriya
Tripoli Medical Center

Ref. No.: 24141-39.6-5.14-10.10-2.16
Date: 07.10.2010

Student/ Moamer Mohamed Gashoot
Bournemouth University – England

Dear Sir,

With reference to the application submitted from you on 04/10/2010 regarding your request of accepting the field study of the internal design for the buildings of Tripoli Medical Center.


Therefore, we inform you that we accept to do the field study and data collecting regarding the internal design for the buildings of Tripoli Medical Center.

We hope all success for you.

Thank you,

Signed & Stamped
Dr./ Mohamed Abdusalam Ajaja
Director, Engineering Affairs Department

CC/ - General Secretary of the Center.
- Heads of Engineering Depts.
- General Periodical File.



Appendix P: Consent form two

نموذج موافقة

المؤسسة: جامعة بورنموت
الدرجة: دكتوراه
الهدف من الدراسة: التعرف على مكونات حجرة مستشفى عام
الموقع، باحث: طالب
اسم الطالب: معمر قشوط
هاتف بريطانيا: 07796692120
هاتف ليبيا: 0914774332
بريد الكتروني MoamerGashoot@bournemouth.ac.uk

موافقة:

- أنا... أنا... أنا... لا مانع لدي من تسجيل المقابلة مع الباحث.
- أفهم أن المقابلة سوف تستعمل في المشروع النهائي وهذه المقابلة لن تستعمل لأي غرض آخر.
- المقابلة سوف تحفظ في مكان سري ولن تعرض لأي شخص خارج هذا البحث.
- يحق لي أن أخرج من هذه الدراسة لو كانت غير مريحة لي.
- سيحفظ بهذا البحث لمدة ثلاث سنوات قبل التخلص منه- بناء على قانون (د. هـ، مارس، 2006).
- الطريقة للمقابلة شرحت لي من قبل الباحث.
- أفهم بأن اسمي لن يكون ظاهر في أي حال من الأحوال.
- أنا... أنا... أنا... لا أمانع من المشاركة.

التوقيع: التاريخ: 7-2-2011
توقيع الباحث: التاريخ: 7-2-2011

Appendix Q: Consultation Schedule Two

موضوع المقابلة

تصميم حجرة فردية لنزول بمستشفى عام

1. مقدمة: تعريف، الاسم واللقب

2. الغرض من المقابلة.

- لفهم التصميم المفضل لدى المشاركين في هذه الدراسة.

1. تصميم داخلي شكل الحجرة ومضمونها.

2. شكل الحجرة ومضمونها.

3. استشارة هندسية.

تعني سؤال وإجابة ما بين الباحث والمشارك.

سؤال 1:

ما هي مكونات حجرة المستشفى؟

الغرض من هذا السؤال هو فهم رأيك في المكونات.

.....

سؤال 2:

لماذا اختار المشاركون هذه المكونات؟

للمشاركين الحق في اختيار المكونات التي يرونها مناسبة.

.....

أسئلة إضافية:

تخيل أنك في حجرة، ما هي اختياراتك، الباحث سيساعدك على نوع الأجوبة.

ما عليك إلا أن تقدم أفكارك وذوقك المفضل في هذه الحجرة من أثاث، ألوان، فنون،

أرضيات، إلخ.....

الأسئلة:

- ما هو لون الجدار المفضل لك في حجرة فردية، وماذا تشعر عندما تنظر إلى هذا اللون.

.....

- ما هو لون الأرضية المفضل وما نوع الخامة، رخام، خشب، سجاد.

.....

الأثاث:

- نوع الأثاث.

.....

- نوع الخامات المستخدمة والتي صنع من الأثاث.

.....

- وماذا تشعر بوجودها.

.....

- لون الأثاث.

.....

- مكان السرير.

.....

- مكان الجلوس.

.....

- أي نوع من الأثاث.

.....

الإضاءة:

- ما هو نوع الإضاءة المفضلة لك.

.....

- لماذا اخترت هذه الإضاءة.

.....

- وماذا تشعر لاستكمال هذه الإضاءة.

.....

- ماذا عن الإضاءة الطبيعية، أي نوع تفضل.

.....

- هل تجد الإضاءة الطبيعية أو الصناعية.

.....

إلى اثنين

الفنون:

- ما هو نوع الفن التشكيلي الذي تحبذ في تلك الحجرة.
.....
- لماذا اخترت هذا النوع.
.....
- موقع اللوحة، في مواجهة السرير، أو خلف السرير، بجانب السرير.
.....
- ماذا يعني هذا النوع من الفن لك.
.....

منظر النافذة:

- هل تريد شباك في تلك الحجرة.
.....
- موقع الشباك.
.....
- ما نوع المنظر المقابل للنافذة، مشهد مثلاً.
.....
- في أي جانب.
.....
- ما هو نوع الستارة المفضلة لك، لونها، خامتها- محتواها.
.....

نبات زينة:

- هل تريد نباتات طبيعية أو زينة.
.....
- ما نوعها.
.....
- ما هو مكانها.
.....

الأبواب:

- ما هو نوع الأبواب المفضلة لك، خامتها ولونها.
.....
- ما هو نوع المكملات.
.....

الموسيقى:

- نوع الموسيقى، ولماذا.
.....

كمبيوتر وانترنت وتليفون:

- كيف تتحدث مع أسرتك.
.....
- ما نوع الجهاز المستعمل (كمبيوتر - أو لاب توب)
.....
- تليفون أي نوع (أرضي - موبائل)
.....

تلفزيون:

- هل تشاهد الأخبار وما هي برامجك المفضلة، ولماذا
.....

حمام:

- ما هي التسهيلات التي تحتاجها.
.....
- 1. أي اقتراح آخر في رأيك، مثلاً شيء لم يناقش وقد يكون مهم بالنسبة لك.
.....

شكراً على التعاون معنا