

IUL School of Social Sciences
Department of Social and Organizational Psychology

Where healthcare takes place: A route to patients' well-being

Cláudia Raquel Campos Andrade

Thesis submitted in partial fulfillment of the requirements for the degree of
Doctor in Psychology
Specialty in Clinical and Health Psychology

Supervisor:

Ph.D, Maria Luísa Soares Almeida Pedroso de Lima, Full Professor
ISCTE - Lisbon University Institute, Lisboa, Portugal

Co-supervisor:

Ph.D, Marino Bonaiuto, Full Professor
University of Rome, La Sapienza, Rome, Italy

October, 2012

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Jury

Ph.D. Maria Manuela Calheiros, Assistant Professor at ISCTE-IUL, Portugal

Ph.D. Ann Sloan Devlin, Full Professor at Connecticut College, USA

Ph.D. Bernardo Hernández Ruiz, Full Professor at University of La Laguna, Spain

Ph.D. Margarida e Sá de Vaz Garrido, Assistant Professor at ISCTE-IUL, Portugal

Ph.D. Maria Luísa Soares Almeida Lima, Full Professor at ISCTE-IUL, Portugal

Ph.D. Marino Bonaiuto, Full Professor at University of Rome, La Sapienza, Italy

October, 2012

The present work was sponsored by a Doctoral Grant (Ref. SFRH/BD/43452/2008) of the Portuguese Science and Technology Foundation



Acknowledgements

I would like to use this space to express my gratitude to all those important people in my life who encouraged, helped, and guided me along this journey.

First and foremost, I would like to thank my supervisor, Professor Luísa Lima, for encouraging me to take the adventure of a Ph.D, and for her support, guidance, and stimulation through the entire duration of my project. Luísa, I've always admired your great knowledge and experience in different areas, and I feel privileged and grateful for what I could learn with you. I have been amazingly fortunate to have a supervisor who gave me the freedom to explore on my own, and at the same time providing me the guidance I needed to recover when my steps faltered. You were always able to sharply rephrase something that I could only vaguely describe, and to show me the way to go on. Hopefully, we are going to collaborate and work together again in the near future.

Also, I am truly thankful to my co-supervisor, Professor Marino Bonaiuto, for having accepted to take part in this work, and for welcoming me in the beautiful city of Rome. Thanks for your important feedback and for introducing me to another person who had also very important role throughout this process: Ferdinando Fornara.

Ferdinando, you are not just a great researcher but also a very nice person. I appreciate your enthusiasm, your advices, and all your contributions to my project. Also, I am very grateful for the confidence you placed in me, giving me the opportunity to write my first chapter with you. I hope to collaborate with you for many years to come.

I had the privilege to work with three other inspiring professors: Ann Sloan Devlin, Bernardo Hernández, and Cícero Pereira.

I owe a big thanks to Professor Ann Devlin who so well received me in New London. I would like to thank you for your availability, your help, your insightful and always precious comments, and for your enthusiasm when discussing this project with me. You are an example of hard work, method, and insight. Thanks for the dedicated time and effort to review my texts, for supporting the ideas for projects I have brought to you, and, most of all, thank you for your friendship.

A special thanks to Professor Bernardo Hernández for the opportunity to spend some time in La Laguna, and for having introduced me to so many extraordinary people:

Antonia, Carmen, Estefanía, and to all the PhD students in the Department, who have made me feel at home during those two weeks. Thank you for being so supportive and encouraging regarding my research, and for your insightful comments, and challenging questions. It was a privilege to work with you and to benefit from your sharp and sensible inputs.

A very big thank you also goes to Cícero, who I would like to call my third supervisor. I could not have done this thesis without his precious help. Cícero, you were always available when I needed support to overcome the statistical hurdles of data analysis. Your sense of humor, optimism, and encouragement were important “statistical” assumptions so I could carry on.

To Margarida Garrido I thank her valuable comments to my annual reports. Thank you for your feedback, and for your incentive to publish.

During my time as a PhD student I have met many nice and inspiring colleagues. A special thanks goes to: Nuno Pinto, Cláudia Simão, Raquel Bertoldo, D’Jamila, Sara Fernandes, Vítor Hugo Silva, Pedro Rosa, Ana Emauz, Catarina Azevedo, Ana Rita Farias, Eunice Magalhães, Nuno Ramos, Susana Batel, Carla Mouro, and Ricardo Rodrigues.

This research would not have been possible without the collaboration of the participants who took part in the studies. I deeply thank the hospitals who allowed this work to be conducted: Hospital Curry Cabral, Hospital Ortopédico Dr. José de Almeida, Hospital Ortopédico Sant’iago do Outão, Hospital Médio Tejo in Tomar, and Hospital Cuf Descobertas. I would also like to thank to Anilza Sousa, João Santos, and Paula Gil, who did such a wonderful work helping me collecting or introducing data; and to João Cardim, and Filipa Fiúza, who assessed the physical environment of the hospitals.

I am very grateful to ISCTE-IUL: to the Department of Social and Organizational Psychology, and its PhD Program for providing me with the training and the resources I needed to accomplish this task; to LAPSO and Helena Santos, for the support and for providing me the equipment I have needed to complete my studies; and to CIS-IUL for all the administrative help. I also would like to thank to FCT for the financial support throughout these four years. Thanks also to ISPA’s library and its workers, for letting me write there part of this work.

Coming to an end of this Acknowledgments section, means expressing my gratefulness to the most important people in my life.

My most intense thanks goes to Rita Gouveia, who is the sister I did not have... To Cristina Godinho, who was my first friend in Lisbon, and who has been a friend since then. To Catarina Martins, a special friend who lived this journey with me. To Mariline Justo, for all the moments that made our bond strong. To Ana Loureiro, and Ana Isabel Ferreira, two of the greatest and strongest women I have ever known. Thanks for being so sweet and supportive (Ana L.: and thanks for giving voice to “my” stories!). To Ana Salgado, Inês Direito, and Ana Mendes, who I know for a long time, and who were always there for me. To Tomás Palma, who had an important place in my life, and who I thank for being a good friend. You all made and make my life happier and brighter, and you all will always hold a special place in my heart.

I still need to thank to my friends Xico, Joana Braga, Vasco Baião, Jorge Correia, Bianca Busante, Liliana Araújo, António Costa, Miguel Moreira & Liliana Azevedo, Micaela Paiva, Barbara Tomassini, Raquel Perez, Raquel Bertoldo & Luís Carlos, Rita Margarida Morais, Sara Gorjão, Sibila Marques, Marcelo Moriconi, Tiago Carvalho, Diana Carvalho, and Rodrigo Gonçalves. I feel grateful to have each of you in my life... and I hope it continues like this for a long time. I also thank to Paula, Sr. Reis, and my neighbors Ricardo, and Helena, for making happier my daily journey!

A warm thank you goes to my family, especially to my mom and my dad, for always supporting me, and for all their unconditional love and affection. Thanks for your understanding when I was physically and/or mentally absent. To Érica, thanks for the laughs, and for your endless energy and humor.

O hospital e a praia

*E eu caminhei no hospital
Onde o branco é desolado e sujo
Onde o branco é a cor que fica onde não há cor
E onde a luz é cinza*

*E eu caminhei nas praias e nos campos
O azul do mar e o roxo da distância
Enrolei-os em redor do meu pescoço
Caminhei na praia quase livre como um deus*

*Não perguntei por ti à pedra meu Senhor
Nem lembrei de ti bebendo o vento
O vento era vento e a pedra pedra
E isso inteiramente me bastava*

*E nos espaços da manhã marinha
Quase livre como um deus caminhava*

E todo o dia vivi como uma cega

*Porém no hospital eu vi o rosto
Que não é pinheiral nem rochedo
E vi a luz como cinza na parede
E vi a dor absurda e desmedida*

Resumo

Tem-se acumulado evidência de que as características objectivas do ambiente físico hospitalar têm impacto sobre o bem-estar dos doentes. Argumentamos que o conhecimento acerca do papel do ambiente físico hospitalar está incompleto se não se considerarem os mecanismos psicológicos subjacentes, e se não se determinar a sua contribuição específica. O Estudo 1 apresenta a adaptação e validação de uma medida da percepção da qualidade do ambiente hospitalar. O Estudo 2 mostra que a relação entre a qualidade objectiva do ambiente físico e o bem-estar dos doentes é mediada através das suas percepções acerca do ambiente físico e social, estando estas altamente correlacionadas; e que este processo é moderado pela condição do doente. Embora não se tenham encontrado diferenças na relação entre a qualidade objectiva do ambiente físico e as percepções do ambiente físico e social; a satisfação dos doentes internados é explicada pela percepção do ambiente social, enquanto a dos doentes na consulta é explicada pela percepção do ambiente físico. O Estudo 3 revela que as pessoas associam a qualidade do ambiente físico à do social e que ambas comunicam uma mensagem sobre o bem-estar que pode ser esperado. Finalmente, o Estudo 4 mostra que, controlando o efeito do ambiente social, o ambiente físico tem um efeito independente sobre o bem-estar, mas apenas quando é inadequado. Globalmente, estes resultados demonstram a relevância do ambiente físico para a experiência dos doentes e sugerem a necessidade de uma abordagem mais abrangente na compreensão da influência do ambiente físico hospitalar.

Palavras-chave: hospital, percepção da qualidade ambiental, bem-estar

PsycINFO Codes:

3365 Promotion & Maintenance of Health & Wellness

3371 Outpatient Services

3379 Inpatient & Hospital Services

4000 Engineering & Environmental Psychology

Abstract

Evidence has been accumulated showing that the objective features of hospital physical environment have an impact on patients' well-being. We argue that our understanding the role of the hospital physical environment is incomplete without an account for the underlying psychological mechanisms involved, and without determining its specific contribution. Four studies are presented. Study 1 presents the adaptation and validation of a measure of hospital environmental quality. Study 2 showed that the link between the objective physical environment and patients' well-being is mediated through perceptions of hospital physical and social environments, highly correlated; and that this process is moderated by patients' status. For both inpatients and outpatients, objective environmental quality predicts the perceptions of the hospital physical and social environments. However, it is the perceived quality of the physical environment that predicts outpatients' satisfaction, whereas inpatients' satisfaction predicted by the quality of the social environment. Study 3 revealed that the quality of the hospital physical and social environments are associated in people's minds, and communicate a message about the well-being that can be expected. Finally, Study 4 showed that the physical environment has a significant effect on expected well-being, regardless of, and over and above, the quality of the social environment, but only when it is inadequate. This set of results substantiates the relevance of the physical environment to patients' experience. All together, our work suggests the need of a more comprehensive approach to improve the understanding of the influence of hospital physical environment.

Keywords: hospital, environmental quality perception, well-being

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1

GENERAL INTRODUCTION

Some years ago, a friend and I decided to go to a blood donation center. After checking in, we were asked to wait in an empty waiting room. It was a warm spring day, but the room was dark and stuffy. It also had old and uncomfortable furniture, and no interesting distracting elements. After a few minutes in that room, my friend and I decided to leave. We left without doing the blood donation because we both thought the same thing: “I cannot stay here, let’s come back another day”.

I am telling this story because I believe it is representative of the impact that the physical environment can have on people. In this case we were, voluntarily, in a blood donation center. If, instead, we were in a hospital outpatient care unit because one of us was sick, we would probably have stayed. At the end of a hospital visit, what are the consequences of an unappealing and unsupportive physical setting? There must be some. And the difference is that people do not have the option to leave, as we did.

1. Aims and overview of the present thesis

The general purpose of this thesis is to help understanding the role of the physical environment on the patients’ hospital experience. The link between the physical setting *where care takes place* and its consequences in terms of *patients’ well-being* has been systematically described in the literature. This thesis has two central aims: a) to shed light on the psychological processes involved on the relationship between the hospital physical conditions and the patients’ well-being, and b) to identify the unique effect of the physical environment.

The present work is organized in five chapters. The present chapter starts by describing the increased demands that healthcare services are currently witnessing, and the role of psychology on improving health care delivery. Then, we provide a glimpse into how the patient hospital experience has been described in the literature, and we present the main concepts that support our thesis. Next, we review past and more recent research that has demonstrated the effects of the health care physical environment on patients’ outcomes; and, subsequently, we briefly describe research on the crucial role of the human side of care delivery: the relationship with the health care providers. At that point, empirical evidence on the associations between the perceptions of physical and social environments will be presented; and we will point out the need for a valid and reliable measure on the perceived quality of the hospital environment. Finally, in the last section of this chapter, we introduce our research program, and how it aims to

contribute to the current state of literature on the role of the hospital physical environment.

The three chapters that follow this theoretical introduction are empirical chapters in which we present four studies (Chapters 2, 3, and 4). All of these chapters are based on published or submitted articles. In Chapter 2, we present the study of the adaptation and validation of a measure of hospital environmental quality perception. Chapter 3 reports a field study that was carried out to investigate the mediating role of the perceptions of hospital physical and social environments on the relationship between the physical environment and patients' well-being. Moreover, we tested if this process is moderated by patients' status, that is, if the objective physical environment impacts inpatients' and outpatients' satisfaction by different social-psychological processes. In the last empirical chapter, Chapter 4, we present two laboratorial studies. The first study investigated the inferences people make about the physical environment when only information about the social environment is available, and vice-versa. The second study was designed to disentangle the independent effect of these two dimensions (physical and social) on expected well-being.

Finally, Chapter 5 presents a summary of the findings obtained in our studies, and integrates them in a general discussion, stating the contributions they give to the understanding of the role of hospital physical environment. At last, we identify the main limitations of our research and avenues for future research.

2. General Background

A brief look at current healthcare demands

In Portugal, eighty-five percent of the population goes to the doctor at least one or two times per year (Villaverde Cabral, 2002). In 2010 there were one million and two hundred thousand internments just in public hospitals, ten million and two hundred thousand emergency consultations, and forty-three million and seven hundred thousand outpatient consultations (PORDATA, 2012a). This means that, during our life, all of us will probably spend some of our time in the hospital.

As a result, countries spend a considerable percentage of their Gross National Product on healthcare, much of which is provided in hospitals. For example, in 2010 Portugal expenses on health care delivered by hospitals was approximately 7 billion

Euros (PORDATA, 2012b), and these expenses have been growing. Ageing populations, rising chronic diseases, drugs prescription, and new medical technologies in an era of economical recession, are just some of the factors that make health care spending and affordability a major policy priority¹. Hence, healthcare administrators everywhere are under strong pressures to control or reduce costs yet increase care quality (Ulrich, 2002). For example, in 2011 the American Department of Health and Human Services proposed a number of policies to help physicians, hospitals, and other caregivers improve the safety and quality of patient care and make health care more affordable through the “Accountable Care Act”. One of the measures aimed at cost containment includes refocusing medical delivery systems to be patient-centered, and improving the coordination and quality of care². “Patient centered care” and other related concepts will be described later in this chapter.

The role of (Health and Environmental) Psychology

Improving the public health and decreasing the need for medical care has been fostered by the development of health promotion policies (Peersman, 2001). Health Psychology has here an exceptional contribution by studying how people stay healthy, why they become ill, and how they get over illness, as well as by developing health promotion, and health maintenance interventions (Taylor, 2011). For example, Health Psychology is concerned with psychological factors of health and illness such as coping, social support, and lifestyle. Health Psychology has also been interested in the quality of the delivery of care (APA, 1976; in Weinman, 2007) in terms of process and outcomes of medical encounters, which includes the study of the interactions between patients and healthcare providers, and the adjustment to the hospital experience. This is important because going to a hospital is often a stressful event in the life of a person, and the way care is delivered can be decisive to patients’ well-being and to the success of the healing process.

Research in this particular topic – the quality of the hospital experience – has been mostly focused on the relationship and communication between patients and health care providers. It has been widely recognized that an effective patient-health care

¹ <http://www.kaiseredu.org/issue-modules/us-health-care-costs/background-brief.aspx>

² <http://www.healthcare.gov/news/factsheets/2011/03/accountablecare03312011a.html>

provider relationship can improve patients' satisfaction and use of services, as well as the efficacy of treatment, and the rapidity with which illness is resolved (Taylor, 2011).

Another aspect of the hospital experience that has been linked with patients' satisfaction, emotional well-being, and other relevant health outcomes is the quality of health care physical environment (for a review, see Ulrich et al., 2008). These studies come mostly from the literature of Environmental Psychology. In fact, the studies that examine the predictors of patients' satisfaction and well-being recurrently find the quality of the medical encounter as the strongest predictor (e.g., Gotlieb, 2000; Harris, McBride, Ross, & Curtis, 2002; Raposo, Alves, & Duarte, 2008; Rowlands & Noble, 2008). On the other hand, when perceptions of the physical conditions of health care setting are taken into account (not typically; e.g., Sun et al., 2000), they often appear as a weaker but significant contributor. For example, Harris et al. (2002) interviewed 380 discharged inpatients to identify environmental sources of satisfaction with the hospital, and, specifically, to determine the relative contribution of environmental satisfaction to overall satisfaction with the hospital experience. Environmental satisfaction, that is, satisfaction with interior design, architecture, housekeeping, privacy, and the ambient environment, was perceived as a source of the overall satisfaction, following nursing and clinical care. Similarly, a survey conducted involving inpatients in public and private hospitals, some of them who had experienced hospital services in a foreign country, found that doctors, nurses and tangibles (facilities) explained the variation in patient satisfaction (Andaleeb, Siddiqui, & Khandakar, 2007).

However, there are also a few studies in which no significant effect of the physical environment is found (Cho, Lee, Kim, Lee, & Choi, 2004; Mowen, Licata, & McPhail, 1993). Probably one of the reasons for this inconsistency (both in considering or not the physical environment, and on finding or not a significant effect) is due to the use of diverse measurement methods. Another reason is related with the fact that this research is correlational, which means that the effect of the social environment may totally or partially overshadow the role of the physical environment. Hence, the unique role of the physical environment to patients' well-being is not clear and needs further investigation.

Therefore, it seems that integrating what is known from Environmental Psychology on the influence of the physical environment on people's perception, with the literature from Health Psychology on the patients' perception of practitioners might be useful to explain patients' outcomes, and to improve the delivery of care. Although

handbooks in Health Psychology traditionally have a chapter focusing on how the patient-practitioner interaction contributes to patient satisfaction, and other quality measures or health outcomes such as loyalty, and recovery (e.g., Lyons & Chamberlain, 2008; Taylor, 2011), usually no reference is made, for example, to how the healthcare physical environment may influence perceptions of those interactions. On the other hand, studies from Environmental Psychology on the impact of the healthcare physical environment on patients' well-being have not considered controlling for the crucial influence of the social environment.

In this thesis we propose that, even controlling for the human dimension of care – an unquestionably important dimension for the success of a hospital experience – the quality of the health care physical environment has also a unique significant role. Next, we present how hospitals have been described as unpleasant places that potentially pose a threat to patients' well-being.

The patients' experience at the hospital

- *“Not only I am sick, I also had to go to the hospital”*

Going to a hospital should be viewed as a source of relief or reassurance but in psychological literature it is primarily conceptualized as a source of stress (Powel & Johnston, 2007). Although being sick is unpleasant, being hospitalized adds other negative dimensions to the person's experience (Sarafino, 1990).

Inevitably, patients in this situation worry about their condition, about likely painful treatments, and aversive medical procedures, and about how the illness will affect their lives. Patients also have worries that are unrelated to their health, often concerning the welfare of the family at home in the patients' absence, or the disruption of their everyday life and work obligations, and these ongoing discomforts and uncertainties can generate stress (Powel & Johnston, 2007). Johnston (1980) have shown that high levels of anxiety were not restricted to the immediate pre-operative period, but experienced before admission to hospital, between admission and surgery, and following surgery. However, some authors consider that hospitals do little to calm those anxieties, and many times exacerbates them (e.g., Taylor, 2011).

Although the word *hospital* comes from the same root as the word *hospitality*, many patients don't find hospitals to be very hospitable places (Straub, 2012). For many patients the unfamiliar and strange environment of a hospital requires additional

psychological and social adjustments that are difficult to make. For example, hospitalized patients are ushered into a strange room, given strange clothes, provided with roommates they do not know, subjected to unknown procedures, and have to stay physically confined. In this thesis patients that spend at least one night in the hospital will be referred to as “inpatients”.

Visiting a hospital ambulatory care unit only for a consultation is obviously distinct from staying overnight in a hospital room dependent from the care of health care providers. Contrary to inpatients, outpatients are not going to be submitted to a complex procedure or surgery, but often to quick consultations to manage minor ailments or to request for a renewal of a prescription. However, in addition to the possible worries they may have about their health, namely fearing that they may really be ill, or not fully recovered, outpatients often face a crowded, confusing, and unpleasant environment, and a time-consuming process (Erger & Marelich, 2004). In general, these conditions may add stress to the already disturbing experience patients are going through.

Psychoneuroimmunology has a long time ago linked stress and health, although there are a number of difficulties in establishing a definitive link (Ayers & Steptoe, 2007). Stress response involves cognitive, emotional, behavioral, and physiological effects (Steptoe & Ayers, 2005). People under stress might experience changes in perception and attention, memory processes, and decision-making; as well as feelings of distress, anxiety, fear, and depression. Physiological stress responses affect changes in immune, endocrine, cardiovascular, gastrointestinal, and other bodily systems' activity. As all these stress-related changes may create susceptibility to disease, affect disease progression or retard the speed of recovery (Dougall & Baum, 2001).

For example, studies have shown that enduring chronic stressors were associated with greater susceptibility to colds (Cohen et al., 1998), and to impairing cutaneous wound healing (Ebrecht et al., 2004). Even something as transient, predictable, and relatively benign as academic examination stress was found to have significant consequences for wound healing of healthy young adults (Marucha, Janice, & Favagehi, 1998).

For example, in the study of Marucha et al. (1998), two punch biopsy wounds were placed on mucosal tissue of dental students, first during the summer vacation, and second 3 days before their first major examination of the term (each student served as his/her own control). Wounds placed 3 days before examinations healed on average

40% more slowly than those made during summer vacation, and no student healed as rapidly during examinations as during vacation. This study suggests that other everyday stressors that elicit comparable emotional responses may produce similar deficits in wound repair. Thus, stress-related defects in wound repair may have important clinical implications, for instance, for patients' recovery from surgery. Studies with patients that were submitted to surgery found that patients with high preoperative anxiety tend to use more medication for pain, stay in the hospital longer, and report more anxiety and depression during their recovery than patients with less preoperative anxiety (for a review, see Munafò & Stevenson, 2001).

In sum, this research indicates that the (unnecessary) stress patients experience in the hospital should be reduced to as less as possible. Although some of the stressors patients face in the hospital are unavoidable, such as illness and having a new environment to adapt to, others are not (Powel & Johnston, 2007). Indeed, research has been showing that a supportive health care physical environment, and good relationships with the health care providers are two ways of reducing stress responses, and fostering patients' well-being and satisfaction. Thus, from our point of view, fostering healthcare quality from the point of view of patients is an alternative approach to deal with the problem of the hospital as a stressful place, both in terms of research and practice.

Moreover, patients should have the most positive and satisfying hospital experience possible because patients who are satisfied with care tend to follow medical regimens (e.g., Bartlett et al., 1984; Jin, Sklar, Oh, & Li, 2008), and are more likely to return to that medical services in the future (e.g., Marquis, Davies, & Ware, 1983; Hill & Doddato, 2002), which means that treatment is likely to be more efficient and recovery more rapid. Consequently, patient dissatisfaction not only fosters health risks by leading patients to avoid using services in the future, but also poses costly and time-consuming dilemmas for the health care agencies themselves (Taylor, 2011).

In this thesis we are especially interested in identifying the contribution of the healthcare physical environment to a positive and satisfying experience. Next, we will move to the presentation of the main concepts that help to frame this thesis.

Conceptual framework of the thesis, and the advent of patients' opinions

The movement towards a “patient-centered care” has become increasingly popular. Traditionally, patients have been placed in the role of passive recipients of care delivered by health care experts who know what is best for them (Kvåle & Bondevik, 2008). The need to maximize efficiency has prompted a somewhat one-dimensional, depersonalized view of patients (Straub, 2012). On the other hand, together with the priority given to functional efficiency, the strong emphasis on infection reduction, shaped the design of hundreds of major hospitals internationally, that are now considered starkly institutional, unacceptably stressful, and unsuited to the emotional needs of patients, their families, and even healthcare staff (Ulrich, 2002). However, there have been recent changes to the ways in which patients are positioned in the medical system, and increasingly patients are viewed as active decision makers who have their own experiences, views, and needs that are worthy of hearing (Lyons & Chamberlain, 2008).

A growing focus on the centrality of the patient is linked with the emergence of the “biopsychosocial model” (Engel, 1977, 1980) as an alternative to the biomedical paradigm. This model was a call to change the way of understanding the patient, illness, suffering, and healing, and to expand the domain of medical knowledge to address the needs of the patient (Borrel-Carrió, Suchman & Epstein, 2004). Contrary to the dominant but restrictive biomedical model, which explains illness in terms of biological malfunction, biopsychosocial model assumes that any health or illness outcome is a consequence of the interplay of multiple biological, psychological and social factors. Accordingly, interest on patients' opinions and subjective experience is considered important both for increasing the effectiveness of the treatment, as to increase the dignity and humanity of care.

Engels' model was an important first step toward developing a “patient-centered care”, but this push comes also from the increased “consumer orientation” in the delivery of healthcare. In this context, patients are seen as “consumers” who are “served” by the medical profession, which implies focusing on what patient perceives as good care. “Patient-centered care” is a model of care generally described as understanding the patient as a whole person in his/her wider psychological and social context (Bower & Mead, 2007). Patient-centered care is conceptualized as a clinical method characterized by (i) a receptiveness by the doctor to the patient's opinions and expectations and an effort to see the illness through the patient's eyes; (ii) patient

involvement in the decision making and planning of treatment, and (iii) an attention to the affective content of the consultation in terms of the emotions of both the patient and the doctor (Ogden, 2002). But the concept patient-centered care can also be applied at the level of health policy, less concerned with the specific behaviors of health professionals, and more with broader values such as empowerment of patients, and the need to design health services to fit their preferences and needs, as opposed to the convenience of professionals (Bower & Mead, 2007).

Increasingly, patients' satisfaction is becoming a key outcome for health services. Satisfaction is the evaluation by the patient of the care received, and may be seen as the product of the discrepancies between patients' expectations of care and their perceptions of actual care received (Fitzpatrick, 2007). It is conceptualized as a predictive of future health-related behaviors but also as an outcome in and of itself. As patients have become more concerned with, and more critical of the health care provided, monitoring patients' satisfaction has become a way to understand and incorporate patients' perspectives in the service management (Sitzia & Wood, 1997). Providers wishing to meet patients' needs and wishes more effectively have shown growing interest in the use of patients evaluations and reports (Thi, Briançon, Empereur, & Guillemin, 2002). Patient satisfaction surveys feed information back to the management and medical staff as part of quality improvement efforts. In addition, in some countries hospitals have been publishing information about their patients' satisfaction ratings to enlarge transparency about their performances (e.g., HCAPHS in USA, Devlin, 2010; COPS in The Netherlands, Hekkert, Cihangir, Kleefstra, Van den Berg, & Kool, 2009). This information can be used by insurers and patients to make a more informed choice in their selection of care providers (Hekkert, et al., 2009). Agencies that accredit health care organizations such as the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) have also identified patient satisfaction as an important quality indicator, and have required its measurement to meet accreditation requirements (Eisen, 2007).

This shift stressing the importance of treating patients as individuals, and of attending their needs and preferences includes leading away from costly and unfriendly settings toward more attractive, and human health care facilities (Grosenick & Hatmaker, 2000). Particularly, understanding the contribution of health care physical environment to patients' satisfaction and well-being has practical relevance, since hospitals should maximize all its efforts to provide a psychologically supportive care.

Considering that increasing patients' well-being can be complex and demanding, the potential benefits of physical environment should not be neglected, but intentionally managed for the benefit of patients. Furthermore, contrary to other dimensions of care, physical environment is easily modifiable (Leather, Beale, Santos, Watts, & Lee, 2003) by providers or managers who wish to improve the quality of care (Thi et al., 2002). Recently, "evidence-based design" has been advocated as "a deliberate attempt to base [healthcare] design decisions on the best available research findings" (Hamilton, 2003, p.19), by linking hospitals' physical environments to healthcare outcomes (Ulrich, et al., 2008).

We have been arguing that the hospital experience is likely to be a disturbing and distressing experience. Moreover, we attempted to convey the idea that patients' satisfaction is an important indicator of well-being. We consider satisfaction a laudable aim in itself, but the accumulating evidence that satisfaction is positively correlated with other health outcomes, and with the success of the hospitals' purposes, makes it even more relevant.

The concepts that we have described sustain our perspective that integrating the opinion of patients about "what is quality of care" into the therapeutic strategy will strength the partnership dimension of care and weaken the obsolete paternalistic approach (Mpinga & Chastonay, 2011). Ultimately, the benefit of the patient is the success of the health care organization.

This thesis is based on the premise that more attractive, and human health care facilities make a significant difference on patients' perceptions of their hospital experience, thus contributing for patients' satisfaction and well-being. Throughout this work, the benefits of a good physical environment will be considered as a potential ally of the quality of the hospital social and interpersonal environment.

Next section will provide an historical overview of the early studies on the effects of the healthcare physical environment, and then we will move towards examining the most recent literature on this topic.

3. The healthcare physical environment and the patients' well-being

A brief historical review

The first studies on the influence of hospital design on patients' behavior took place in the early days of the Environmental Psychology as a distinct field of study, or even before. For example, Osmond's theory (Osmond, 1957) on the existence of "sociofugal" spatial settings, aimed at discouraging social interaction, and "sociopetal" settings, able to encourage social interaction was tested by Sommer and Ross (1958). These researchers studied the effects of furniture arrangement on social interaction in a geriatric ward. The furniture of a day-room was rearranged from shoulder-to-shoulder seating (against the wall) to chairs grouped around tables, and, as a result, communication among elderly woman increased more than 50%. This study and most of the studies conducted at this time followed Osmond's postulation that "structure will determine function unless function determines structure" (1957, p.23).

In 1958 William Ittelson and Harold Proshansky formed a research group at the City University of New York that – over 8 to 9 years – studied how the spatial and architectural setting of a psychiatric hospital affects patients' behavior (Bonnes & Secchiaroli, 1995). This program of studies aimed at providing help to those involved in the planning and design of psychiatric facilities (Ittelson, Proshansky, & Rivlin, 1970a). One of the works produced by Ittelson and colleagues compared the behavioral consequences of various bedroom sizes, based on behavioral mapping (Ittelson, Proshansky, & Rivlin, 1970b); that is, on the observation and record of the location, participants, time, and nature of all the activities in the ward. This study found a strong association between multi-bed rooms and social withdrawal (Ittelson et al., 1970b). Some years later, in 1980, Keep, James, and Inman published a retrospective study on the consequences of windowless intensive therapy units. In the 70's some units without windows were still operating or being constructed. Researchers compared memories of patients who had been in a unit without windows with those of patients who have stayed in a unit with translucent windows. Results showed that patients from the unit without windows had less accurate memory of the length of their stay, were less oriented in time during their stay, and had more hallucinations and delusions than patients from the unit with windows.

This brief historical excursus shows clearly how this topic has marked the first steps of Environmental Psychology (Fornara & Andrade, 2012). In this period Environmental Psychology was a lot stimulated by (and restricted to) Architecture, preoccupied with constructing more practical and comfortable surroundings (Pol, 2007). These first investigations on hospitals, especially psychiatric hospitals, tried to contribute to an immediate need, the increase of the therapeutic effectiveness of psychiatric facilities through appropriate design (Ittelson, Proshansky, & Rivlin, 1970a). These studies are an example of the collaboration between psychologists and architects on the identification of optimal solutions from the aesthetical point of view and, above all, from functional adequacy of architecture with respect to the needs and expectations of the building users (Bonnes & Secchiaroli, 1995). After this initial period of enthusiasm, the relationship between psychology and architecture faded because psychology could only provide general principles to respond to the specific needs of practice and not unequivocal answers (Uzzell & Rätzzel, 2009). Hence, and despite increasing complexity of hospitals and calls for research, there was some deceleration in the publication of research on healthcare environments in the last decades (Sundstrom, Bell, Busby, & Asmus, 1996).

Nevertheless, is worth mentioning that between 1980 and 1986, Janet Carpman and Myron Grant coordinated the “Patient & Visitor Participation Project” at the University of Michigan Medical Center. Their mission was to take a large, complex teaching hospital construction project and influence its intractable decision-making design process to include the patient’s needs and perspectives into the design decision-making process. “Customer involvement in health facility design had never before occurred on this scale and hasn't since. The project resulted in more user-friendly design and new understanding of patients' and visitors' design needs, one of which was wayfinding” (<http://www.wayfinding.com/partners.asp>). As a result, in 1986 Carpman and Grant published a seminal book called “Design that Cares: Planning Health Facilities for Patients and Visitors”. In their vividly illustrated work, authors reviewed what was known at the time on health care design, described research findings, gave explicit practical guidance for planning medical settings that assist and support the healing of patients, and provided a model of how to gain more information so that the field continued to grow.

The first studies on healthcare environments were done in a period when Environmental Psychology was mostly preoccupied on evaluating individual

(observable) reactions to specific architectural surroundings, whether to value their functional effectiveness, or their acceptance by users. At that time the meaning and symbolic value and a more experiential approach of space were not present (Pol, 2007), only later research turned its focus to studying the users perceptions (Lima & Sautkina, 2007). More recently, the messages that hospitals communicate, and the patients' subjective experience are being more emphasized. According to Bromley (2012) hospital designs – where rooms are situated, where nurses work, what lobbies look like – reflect the sociocultural, economic, professional, and aesthetic priorities prevalent at a given time. As such, hospital buildings concretize prevalent assumptions about patients, illness, care and healing environments, as well as medical providers' roles, which are interpreted and internalized by users – to a degree, something Carpman and Grant, (1993) called “we care” message. This is related, for example, to the line of investigation by Ann Devlin (Arneill & Devlin, 2002; Devlin, 2008; Devlin et al., 2009).

The healthcare physical environment, as assessed by non-patients

Just as we cannot avoid “judging a book by its cover”, Devlin has been demonstrating that by looking at the interior or exterior appearance of health care facilities people can make judgments about not only the comfort they would feel in these settings, but also the physician's qualities and qualifications, and the quality of care they think will be delivered. For example, Devlin (2008) found that, after viewing photographic slides of the exterior of medical facilities, participants could make judgments about how comfortable they would be in that facility, and about the quality of care they would receive. Respondents rated facilities of the “Large Medical” type to be highest in both quality of care and expected comfort. Building exteriors labeled as “Traditional House” types also produced a positive impression, being described as “homey”, “friendly-looking”, “white”, “clean”, and “neat”. The appearance of waiting rooms also sends a message to potential health care users. Arneill and Devlin (2002) showed that perceived quality of care was greater for waiting rooms that were nicely furnished, well-lighted, contained artwork, and were warm in appearance, than for waiting rooms that had outdated furnishings, were dark, contained no art-work or poor quality reproductions, and were cold in appearance. Furthermore, the comfort ratings of those waiting rooms suggested that “when waiting rooms differ significantly in

appearance from what is expected in the typical doctor's office, the room does not inspire confidence" (p. 355). These results suggest that the perceptions of health care physical environment contribute to first impressions of the level of comfort, and the quality of care and well-being that can be expected. Using the same methodology as the two studies previously described, Nasar and Devlin (2011) found that the features of counseling office environments, namely softness/personalization and order, are associated with perceptions of how bold, friendly, and qualified the therapist in the office was likely to be. Not less important, the likelihood of choosing a therapist based on the office also improved with increases according to those offices' features. Considering that expectations define satisfaction (e.g., Fitzpatrick, 2007), the impressions created by the health care facilities might not only affect the choice of a health care service, and the image that patients bring when they enter the system, but also the resulting evaluation of the service.

Other laboratorial studies with non-patients have focused on the benefits of specific environmental features. Dijkstra, Pieterse, and Pruyn (2008a) used a scenario describing a possible hospitalization, and found that a photo of a hospital room with indoor plants generated less perceived stress to participants than did a room with a painting of an urban environment on the wall. Dijkstra, Pieterse, and Pruyn (2008b) also conducted two experiments to test the effects of environmental coloring (green and orange, both contrasted with white as a control condition) in a healthcare setting on stress, arousal and cognitive appraisals of the room. Besides, they focused on individual differences regarding stimulus screening ability, as a measure of environmental sensitivity (high-screener vs. low-screener). Results suggested that (compared to white) the color orange had a greater impact on feelings of arousal than the color green had on reducing feelings of stress, whereas the color green did not. Most significantly, stress-reducing effects of green and arousal-inducing effects of orange were both more pronounced for people scoring low on stimulus screening ability than for those who are able to effectively reduce the complexity of an environment (high-screener).

These studies demonstrate that even single (and sometimes subtle) features of the physical environment seem to make a difference on individuals' expectations.

The healthcare physical environment, and its impact on patients

But what about the experience of real patients once they enter in a real hospital? Does the physical environment still matters, or its effect is overshadowed or diluted by other more relevant factors? What is the relative importance of the physical environment? In the next section we briefly review a few studies that illustrate the influence that the conditions of an actual hospital physical environment may have on patients.

Leather et al. (2003) found that a relocated (and redesigned) waiting area (described as “nouveau”) was associated with more positive environmental appraisals, improved mood, altered physiological state, and greater reported satisfaction than a traditional waiting area before relocation. Similarly, Becker, Sweeney, and Parsons (2008) compared patients’ perceptions of health care quality before and after a dermatology outpatient practice moved from an older building, described as “traditional” in design and decoration, to a new facility designed to create a highly attractive environment for patients. Patients in the new environment rated the waiting area as being more pleasant, more private, and less crowded than was true for the old environment. In addition, the more attractive environment resulted in improved perceptions of overall quality of care, more positive perceptions of interactions with staff, and more willingness to recommend. Also, Rice, Ingram, and Mizan (2008) examined the effects of the enhancement of a primary care physical environment. The study showed that the enhanced environment was associated with improvements in patients’ satisfaction, patients’ anxiety before and after consultation with the doctor, and patients’ perception of patient-doctor communication.

A drawback of these studies is that the attractiveness and supportiveness of the physical environment is hardly the only thing that changes from an old to a new environment. For example, new procedures may be implemented, and the moral and attitudes of the staff are (hopefully) also likely to be positively affected by those changes. For example, Rice et al. (2008) found that the enhanced physical environment resulted in an increase of staff’ satisfaction with their workplace, and some staff commented on how the new environment positively influenced their mood and well-being. So, the specific effect of the physical environment cannot be disentangled. Moreover, it is possible that the positive impact of a new environment might be conveyed not exclusively by the better qualities it has, but by the novelty *per se*, and the

feeling of being the first to use a new space; or may “merely” reflect a “honey-moon” reaction rather than a prolonged effect.

Swan, Richardson, and Hutton (2003) used a different methodology. They investigated the effects of appealing and typical patient rooms in the same hospital on patients’ evaluations. The patients in the two types of rooms were matched on a number of variables and their services were equivalent (e.g., same physicians, similar housekeeping and food service). However, the appealing rooms were well-decorated, hotel-like, with wood furniture, decorator art, carpeted floors, crown molding, and ceramic tile baths, whereas the typical rooms were standard wardrooms with typical metal hospital beds, inexpensive family sitting chairs, and no artwork. The only differences were that the typical rooms were slightly smaller and noise levels were higher. As a result, appealing rooms resulted in more favorable judgments of the hospital, stronger intentions to use the hospital again, and stronger intentions to recommend the hospital to others, than typical rooms. Patients in appealing rooms also evaluated physicians more positively. What if the attractiveness of the physical environment was also affecting the mood and behaviors of the healthcare providers, being those attitudes (part of) the explanation for the positive patients’ outcomes? It is likely that a comfortable room for patients and family is also more comfortable for staff, thus making their job easier. In fact, this reasoning can also be applied to the studies that examine the consequences of remodeling a care unit, Because the characteristics of the social environment are not completely under control, this study is not an answer to the problem of the specific role of the physical environment. However, the consistency across the studies we have been reviewing – each of which has employed different research designs, patient populations, and methodologies – suggests that the relationship between the attractiveness and supportiveness of healthcare facilities and patients’ perceived quality of care is robust (Becker et al., 2008).

Some of the studies conducted in real health care settings also focused on the influence of a specific feature of the environment. Ulrich (1984) focused on the effect of the view that patients recovering from surgery could have from a window. Patients with a view of nature had shorter postoperative hospital stays, received fewer negative evaluative comments in nurses’ notes, and took fewer potent analgesics doses than patients in similar rooms with a view of a brick wall. Park and Matson (2009) conducted a somewhat similar study. Patients recovering from a surgery were randomly assigned to either control or plant rooms. In comparison with the control, the patients

exposed to plants during recovery had significantly enhanced physiologic responses evidenced by lower systolic blood pressure, lower ratings of pain, anxiety, and fatigue, and more positive feelings and higher satisfaction about their hospital room.

Ulrich and Simons (1986, in Ulrich, 1991) studied the effects of a television placed in a waiting room where blood donors typically spent 10-15 minutes before the blood collection phase. Television was turned off on randomly selected days, and was playing continuously during other days. Data indicated that for days when the television was on, donor stress was higher than days when the television was off, indicated by higher heart rate and systolic blood pressure. Hospital noise has also been found as having a negative impact in field studies. For example, Hagerman and colleagues (2005) focused on the effects of room acoustics on patients with coronary artery disease. They compared patients who were in the unit with sound-reflecting ceiling tiles (bad acoustics) with patients who were there after the replacement with sound-absorbing tiles of similar appearance (good acoustics). Patients with acute myocardial infarction and unstable angina showed lower pulse amplitude during the night in the good acoustics period. In addition to these physiological effects, patients of the good acoustics group considered the staff attitude to be much better and had a lower incidence of rehospitalization than patients treated during the bad acoustics period.

Several qualitative studies (e.g., Baillie, 2009; Henderson et al., 2009; Irurita, 1999; Matiti & Trorey, 2008; Webster & Bryan, 2009), mainly conducted in acute hospital settings, have investigated the meaning of dignity from the point of view of patients, as well as how it can be threatened or preserved. Hospitalized patients are vulnerable to loss of dignity due to impaired health, and physical dependency. The definition of dignity remains complex and unclear, but one can make reference to the broad definition of the Oxford English Dictionary, that describes dignity as “the state or quality of being worthy of respect” (Tulloch, 1997; in Webster & Bryan, 2009). According to Matiti and Trorey (2008), the safeguarding of a patient’s dignity is likely to result in a greater ‘emotional comfort’ or a sense of well-being which can assist recovery. Important to our argument is that these studies have shown that patients recurrently identify the physical environment as an important vehicle to maintain dignity in healthcare settings. Namely, a good physical environment, comfort, cleanliness, the assurance of privacy, or having access to fresh air by patients have been identified as factors with the potential to promote their dignity.

The studies described give an overview of the kind of research and the nature of the findings on the effect of the health care physical environments. As we have seen, the attempt to understand the impact of healthcare physical environment on patients has a relatively long history. Ulrich and colleagues (2008) conducted an extensive review on research on evidence-based healthcare design, and found a great amount of studies that show how the design of the healthcare facilities can increase patients' safety, remove patient stress, improve medical outcomes, and improve overall healthcare quality.

In sum, over the last decades, research has shown the benefits of specific attributes of the physical environment (e.g., view from the window, e.g., Ulrich, 1984), of the overall environment attractiveness (e.g., Swan et al., 2003), or of a setting renovation (e.g., Leather et al., 2003). Other studies demonstrated how relevant it is for patients' satisfaction with care and emotional well-being that they perceive the hospital physical environment as having quality (e.g., Harris, 2002), and others focus on the inferences people make based on what they know about the physical environment (e.g., Arneill & Devlin, 2002). All together, the accumulating evidence is compelling: although the environment matters less than does nursing and other clinical care, (studies have shown that) it still matters. This evidence indicating that a good physical environment can contribute positively to patients' satisfaction and to other relevant outcomes is important if we consider that the hospital experience can be a threat to patients' well-being. If the physical environment can improve patients' experience or, at least, do not aggravate it more, that potential should be not ignored.

However, authors recognize that healthcare environments research is still in its infancy, and claim that more reliable and conclusive evidence is missing (e.g., Devlin & Arneill, 2003; Zimring & Bosch, 2008).

As this review demonstrated, the literature on health care environments have mostly described, in various ways, that different physical conditions can influence patients' outcomes. However, research has paid very little attention to the psychological mediating processes involved on the relationship between the presence of certain qualities of the physical environment and the patients' well-being. An exception is the study of Dijkstra et al. (2008a) mentioned earlier. These researchers found that participants exposed to a photo of a hospital room with indoor plants reported less stress than those in the control condition, and that these stress-reducing effects were mediated by the perceived attractiveness of the hospital room.

The relationship between the health care physical environment and well-being is certainly complex and must involve distinct emotional and cognitive processes. For example, it is possible that a pleasant physical environment might induce positive emotions that, in turn result in higher satisfaction (Gotlieb, 2002). In this thesis we will be especially interested on the effect that the characteristics of the hospital physical environment have on patients' cognitive evaluation of the hospital experience, namely on the perceived quality of the hospital physical and social environments, as well as on how those perceptions relate with well-being.

Research on the impact of healthcare environments has used different methodologies, each of them with strengths, but also some limitations. Experimental studies lack ecological validity and/or artificially isolate the effect of a single feature. On the other hand, field studies are correlational, or quasi-experimental. Either way it is not possible to clearly identify the independent effect of the physical environment, since several other variables are present and necessarily involved on patients' outcomes. For example, studies often neglect the impact of confounding variables as, for example, the quality of the social environment of the health care service. In other words, the specific effect of healthcare physical environment has not been examined. In order to address this knowledge gap, this thesis we are interested in disentangling the effect of the physical environment from the effect of the main predictor of patients' satisfaction: the social environment.

In the section 1.4. we will review research linking positive hospital interpersonal and organizational environments to patients' well-being. Before that, we will briefly address possible moderators of the effect of the physical environment.

The effect of the physical environment: possible moderators

There are several variables that may intercede between the physical environment and human behavior and well-being, such as gender, age, personality, coping strategies, individual tendencies, strengths or vulnerabilities, and the sociocultural context in which the physical environment is embedded (i.e., moderating variables) (Winkel, Saegert, & Evans, 2009). In this thesis we are particularly interested in examining if patients' status – being outpatient or inpatient – influences how the physical environment affects patients' satisfaction. It is likely that, because inpatients and outpatients go through significantly different experiences at the hospital, and probably

differ in terms of vulnerability, dependency, and health status, the physical conditions of the hospital environment affect them differently, or through different processes. Although studies relating the physical environment and patients' well-being have been carried out both in inpatient (e.g., Swan et al., 2003) and outpatient (e.g., Leather et al., 2003) health care settings, the relative weight of these dimensions on inpatients' and outpatients' satisfaction has not often been compared.

An exception is the study of Fornara (2005), who analyzed separately the predictors of inpatients' and outpatients' satisfaction (i.e., socio-demographics, objective quality of the physical environment, and the best indicators of perceived quality of hospital physical and social environments). Results of the final model showed that objective quality of the physical environment and socio-demographic factors did not affect satisfaction. Also, he found that spatial-physical comfort and relations with staff predicted inpatients' satisfaction, whereas outpatients' satisfaction was predicted only by spatial-physical comfort. These results give us a clue that there might be differences between these groups of patients, but when separated models are used, one cannot know if the differences found between the groups are statistically significant.

As was the study of Fornara (2005) did, other studies were concerned with the influence of socio-demographic variables on the evaluations of hospital experience and resulting satisfaction.

A meta-analysis by Hall and Dornan (1990) examined the relation of patients' socio-demographic variables, such as age, ethnicity, sex, socioeconomic status, marital status, and family size, and their satisfaction with medical care. It was found that relations were extremely small, and that greater satisfaction was only associated with greater age and, weaker but significantly, with less education. This and other studies tend to find socio-demographic characteristics are a minor predictor of satisfaction. However, because variation in satisfaction levels may be due to other factors than the quality of care, studies should control for the most important variables (Fitzpatrick, 2007).

4. The healthcare social environment and the patients' well-being

Hospital care includes very intense relationships, involving trust, intimacy, and empathy between the patients and the health care providers (doctors, nurses, allied

health care professionals) (Ancarani, Di Mauro, & Giammanco, 2009). Hence, an effective delivery of care depends to a great extent on the quality of those interactions (Kreps, Arora & Nelson, 2003). Although the main aim of this thesis is to shed light on the role of the health care physical environment, we will use the quality of the social environment as a reference.

Privacy as an indicator of a positive social environment

Privacy refers to people's ability to control interaction with others, including control of information about themselves (Laufer, Proshansky, & Wolfe, 1976). People need privacy to adjust emotionally to daily life with other people (Westin, 1967, in Margulis, 2003), and perceived or actual lack of privacy has been one of the most frequently studied environmental stressors (Robson, 2008).

Appropriate privacy and confidentiality are critical for a good relationship between patients and healthcare providers (Lin & Lin, 2010). However, the spaces in the hospital setting are usually overcrowded or undersized, and, as a result, patients are often surrounded by other patients, (other) family members, healthcare providers, or other staff. In this context, patients are vulnerable to lack of privacy, which may result in detrimental psychological effects including anxiety, and stress (Evans & McCoy, 1998), and in a strong negative effect on satisfaction (e.g., Lin & Lin, 2010).

Privacy can be violated physically by means of spatial intrusion, visually by an extended unwelcome gaze, or acoustically when a conversation can be overheard (Robson, 2008). For example, research in emergency department settings revealed breaches in privacy related to: personal information overheard by others, overhearing others' personal information, unintentionally heard inappropriate conversations from healthcare providers, being seen by irrelevant persons, space provided for privacy when being physically examined, and providers' respect for patients' privacy (Lin & Lin, 2010).

Given the patients' little control over the hospital environment, the protection of their privacy depends largely on the healthcare providers and on the characteristics of the physical environment. Physical environment can influence privacy, namely through spatial hierarchy, physical obstacles, passages, and doorways (Evans & McCoy, 1998). However, staff behavior can strongly influence the provision privacy (Baillie, 2009), for example, by protecting patients from bodily exposure, and by assuring confidentiality.

The lack of privacy is a critical issue particularly for hospitalized patients, who often share their room with other patients, and depend on caregivers for supervision and assistance with personal needs. Obtaining time alone, and having access to private spaces, would be important for emotional release, and contemplation, but also hard to achieve. In multiple rooms the control over the amount and type of contact patients have with others is largely diminished, also because most of these patients are not able to walk off their rooms independently to find the privacy they need. There are other behavior mechanisms that people may implement to regulate the desired levels of privacy, such as verbal and nonverbal communication (Altman, 1976), but these regulatory behaviors require psychological and physical effort that patients may not be able to make.

Single-occupancy rooms provide patients with more privacy than multiple rooms (e.g., Chaudhury, Mahmood & Valente, 2005) because they can avoid upsetting (and being upset) by other patients. However, privacy can still be affected by the health professionals attitudes. For example, patients expect that staff use a low voice to avoid other people listening to their conversations; knock on the door and request permission to come in if the patient's condition allows; close curtains and doors when a procedure is being carried out; that personal information is not discussed or given to another person unless essential or with the patient's consent; and that patients' matters are not discussed at nurses' desks, in open wards or corridors (Matiti & Trotey, 2008). Some of these aspects may also worry patients who visit the hospital only for a consultation.

Privacy is inextricably linked with providing dignified care (e.g., Webster & Bryan, 2009). As a result, enhancing patients' privacy and confidentiality remains central to the quality of care. The physical environment plays a role, but is also a healthcare workers' duty of care to protect the patients and ensure that their privacy needs are met.

Relationships between patients and healthcare providers

Much has been studied about the relationship between patients and health care providers. Our main goal in this section is not to provide an extensive review on that literature, but to briefly illustrate how significant it is for patients that they find a positive social environment when they go to a health care unit and how that has been

addressed (for extensive reviews, see Jin, Sklar, Oh, & Li, 2008; Ong, de Haes, Hoos, & Lammes, 1995; Van Dulmen & Bensing, 2002).

In particular, the communication between patients and doctors has long been regarded as the vehicle by which much of the curing and caring of medicine is conveyed (Roter & Hall, 1989). Research has shown that the physician behaviors can reinforce patients' self-confidence, motivation, and positive view of their health status may therefore indirectly influence patients' health outcomes (Kaplan, Greenfield & Ware, 1989; in Ong, Haes, Hoos & Lammes, 1995). Above all, interpersonal communication in health care is the primary tool for sharing relevant health information (Kreps, Arora & Nelson, 2003). Effective healthcare professional-patient communication is necessary to ensure not only that the patients' problems are understood by healthcare professional, but also that relevant information, advice, and treatment is received and acted by the patient. Communication between healthcare professionals and patients has been object of considerable research, which has attempted not only to describe the interaction processes involved, but also to show how these affect a range of patient outcomes (Weinman, 2007). Different aspects of the communication itself have been studied, including the use of technical language, types of communication (such as discussing uncertainty and unconventional therapies), and breaking bad news to patients (Lyons & Chamberlain, 2009). For example, providing different type of information before operation, which reduces procedural and outcome stress associated with surgery, can produce beneficial effects on a range of recovery indices including pain, mood, and length of hospital stay (for a review, see Johnston & Vogeleson, 1993).

Overall, research has revealed that insufficient information, and jargon and technical language that patients do not understand result in poor understanding of the medical advice, dissatisfaction, and subsequent reluctance or inability to follow recommended treatment or advice (e.g., Weinman, 2007; Straub, 2012). Faulty communication about condition and treatment is a major source of anxiety to patients. Ideally, health care providers listen carefully, ask questions to ensure patients understand their condition and treatment, and fully inform patients about every aspect of their care (Straub, 2012). Recently, many training programs have been developed in order to improve the process and quality of patient care. Although there is some mixed evidence in terms of their effectiveness, a number of studies have showed that, after training, physician's communication skills, and patients' ratings on quality of care increase (e.g., Haskard et al., 2008).

In recent times patients have become more knowledgeable, assertive, insisting that they be heard, and fully informed. Also, their expectations to become full partners in their healthcare have grown (Carpman & Grant, 1993). Hence, there has been a tendency to consider preferable a more patient-centered and emotion-focused communication approach (more opened questions, with greater scope for patients to raise their own concerns and agendas) than a doctor-centered approach (more closed questions, directed by the doctor, with a primary focus on medical problems) (Weinman, 2007). However, although many patients welcome a new, more active role in their health care, people differ in their abilities and willingness to assume this type of role (Joffe et al., 2003; Savage & Armstrong, 1990; Straub, 2012). Presently, studies have been examining the role of symmetry between patient preferences and provider behavior (e.g., Cvengros, Christensen, Cunningham, Hillis, & Kaboli, 2009), indicating that that congruence might be a more robust predictor of patients' outcomes such as satisfaction, and adherence. Nevertheless, regardless of the level of desire or receptiveness that patients may have for a more participative role, what it is common to expect from physicians are attitudes that demonstrate respect, care, and empathy toward patients (Maes, Leventhal, & Johnston, 1992).

Doctors are important, but nurses also occupy a central position within the hospital system for providing patient care, and studies have shown that they have a considerable influence on how patients experience hospitalization (Ofiaz & Vural, 2010). As a matter of fact, for hospitalized patients, the concept of hospital care and the concept of nurses may be inseparable in the minds of patients, because nurses provide much of patients' care (Gotlieb, 2002). For example, Rowlands and Noble (2008) conducted a qualitative study to explore the views of hospitalized patients with advanced cancer on the effect the ward environment has on their overall well-being. Even if it was explained that the purpose of the study was to assist the redesign of the ward, first response was related to the attitude, competence and helpfulness of staff, especially nurses.

Irurita (1999) pointed up that an effective nurse–patient relationship was considered to be central to high quality care as perceived by patients. Patients from acute-care hospital settings considered necessary that nurses were well prepared (with the necessary knowledge and experience), but also that they demonstrated values reflecting care and genuine concern for patients as individuals (evident in empathy and compassion), and that they had pleasant personalities.

The interaction and communication with nurses is also identified as a significant consideration in maintaining patients' dignity (Matiti & Trorey, 2008). However, interestingly, Henderson et al. (2009) found that, although deviations to ideal practice in terms of dignity and privacy are sometimes observed (e.g., curtains surrounding the patient's bed were not completely drawn during transference of patients from the bed to the chair; loud conversations conducted over a greater area than was necessary as the nurses attend to other duties, or in front of other patients), patients did not express any concerns, and express they were generally satisfied with the interactions and provision of care. Other studies also showed that patients tend to understand that "ideal practice" might not always be provided to them because nurses are "so busy" or, alternatively, because they might be too ill to be concerned (Henderson et al., 2009). We can make reference to the study of Baillie (2009), who found that most of the patients described adopting an attitude of acceptance and using humor to counteract threats to dignity, which seemed to make them feel more comfortable. Some patients have also explicitly referred to developing good relationships with staff as a way to have a positive impact on how staff related to them. These studies demonstrate that patients have very clear views about how they wish to be cared for, and patient expectations as to how their dignity should be maintained (Matiti & Trorey, 2008), but also that patients can "excuse" health care providers when they do not completely meet those expectations, and promote their own dignity through their ability to rationalize the situation.

These results can be related to previous studies that show that, despite identifying one or more important problems (Fitzpatrick, 2007), typically patients tend to report high levels of overall satisfaction with care (Eisen, 2007). This discrepancy was discussed by Williams, Coyle, and Healy (1998). These authors found that positive and negative experiences described by patients do not necessarily correlate with their global evaluations of the health care services because patients' expectations are flexible. That is, expectations defined as patients' rights (or "duties" of a service) may be suspended or changed in specific or complex situations where the patient believes there are constraints on providers' practice. Thus, high satisfaction ratings may often reflect attitudes such as "they are doing the best they can", or "well, it's not really their job to do...". According to Portugal (2005), this type of reasoning is prevalent in public services, in which – because of gratuity or low prices and underestimation of the services duties – people tend to have lower expectations on certain aspects of care delivery.

Interacting with a physician or a nurse regarding medical treatment is a complex social process involving interpersonal communication, but also person perception, social judgments, and social influence (Taylor, Peplau & Sears, 2006). Patients normally assume they are receiving the proper procedures from a trained and competent provider. However, patients do not necessarily know what proper procedures are (Arneill & Devlin, 2002). Because patients are poor judges of technical quality of care, they often judge technical quality on the basis of the manner in which care is delivered. Thus, the most successful practitioners are typically those who did a good job satisfying their patients' emotional needs. A warm, friendly practitioner is often judged to be both nice and competent, whereas a cool and aloof practitioner may be judged as both unfriendly and incompetent (Taylor, 2011). But communication is not just words. Everything that transpires during the medical encounter, and every observable characteristic of the setting has a potential communicative function. Patients are alert to information in both verbal and non-verbal forms: what is said and not said, how the healthcare providers are dressed, how and where they sit, how they look, and, also, the physical environment (Winefield, 1992).

Summing up, this section aimed to provide a quick look at what is known about the benefits of a positive hospital social environment for patients' well-being. Given the research reviewed in section 1.3.3., in this thesis we propose that the physical environment has the potential to add force to the those effects of a positive social environment. Moreover, based on the research reviewed so far, it seems that one of the ways through which patients' well-being is increased is when the hospital physical environment and social environments are more positively evaluated. Research also indicates that this is likely to happen in hospital areas have more objective environmental quality.

Next, we will shortly elaborate on the idea that the physical environment affects perceptions and expectations of people, and that perceptions of people may also affect perceptions and expectations of the physical environment.

Inferences from the healthcare physical and social environments

When we meet someone, if only for an instant, we rapidly form impressions about his or her qualities, and for that we use whatever information is available (Taylor, Peplau & Sears, 2006), including information about the physical environment. These

processes operate spontaneously even when we are not specifically trying to make sense of another individual (Smith & Mackie, 2007).

In a medical encounter one of the earliest judgments that most patients attempt to make is whether they think the practitioner is technically competent. However, as noted before, most people know little about medicine and standards of practice to know if they have been treated well or not, so they evaluate medical care using the only information they have, namely, whether the practitioner is warm, friendly, and communicative (Taylor, Peplau & Sears, 2006), and whether the environment is attractive and supportive (Arneill & Devlin, 2002). As some above-mentioned studies on patients' satisfaction and emotional well-being demonstrated, these two sources of information contribute to patients' impressions of the quality of care.

Moreover, perceptions of these two dimensions (physical and social) of the hospital environment may also influence each other. As some of the studies that have been mentioned in this thesis showed (e.g., Swan et al., 2003), the characteristics of the hospital physical context have influence on the perceptions of staff. This influence is well documented also in relation to other environments. This happens because, in general, the environments that people occupy are rich with information about their personalities, values, and attitudes (Smith & Mackie, 2007).

The links between occupants and their personal environments, and between those environments and observers' perceptions of the occupants can be conceptualized in terms of Brunswik's (1956) lens model (Gosling, Ko, Mannarelli, & Morris, 2002). Personal living and working environments are places where individuals spend a great deal of time, and that individuals tend to personalize. Moreover, certain behaviors are so repeated in those environments that leave behind discernible cues. According to Brunswik, physical traces of activities conducted in the environment, decoration elements, or the level of organization and tidiness, can serve as a kind of lens through which observers can draw inferences about the occupants.

The old study from Maslow and Mintz (1956) examined the effect of décor (beautiful vs. average vs. ugly rooms) on judgments of the well-being and energy of people depicted in negative print photographs. The results indicated significantly higher ratings for energy and well-being when the judgments were made in the beautiful than in the ugly room. Harris and Sachau (2005) found that the cleanliness of an apartment also affected the impressions of the resident in terms of personality traits. For example, poor housekeeping was clearly associated with lower levels of agreeableness,

conscientiousness, intelligence, and femininity, and higher levels of openness and neuroticism. The underlying assumption is that we select and create physical environments that both reflect and reinforce who we are, thus observers can learn about others from the environments they inhabit (Smith & Mackie, 2007).

Although a more limited range of activities is performed in workspaces, consistent activities permit the accumulation of residue for work-related traits. Similarly to the previously cited study, Gosling et al. (2002) found that observers inferred from well-organized, neat and uncluttered offices that occupants should have high levels of conscientiousness and agreeableness. Another study examined how the seat location in the office of a hypothetical professor influence the impressions that students form about that professor (Becker, Gield, & Froggatt, 1983). Based on a plan drawing of an office, it was found that a professor sitting at a small round conference table (informal seat location) was evaluated as more fair, friendly, caring, helpful, open-minded, good listener, and less authoritative, and aggressive than a professor sitting across a desk (formal seat location). In other words, the way individuals impact and define their environments guide observers to form impressions of their personalities.

Interestingly, the idea that the attributes of a physical environment affect the perceptions of the people in that environment is not exclusive from Environmental Psychology. Evidence from (Situating) Social Cognition also suggests that social judgments and behaviors are specific to situations and sensitive to the context, specifically to the physical context. Wittenbrink, Judd, and Park (2001) found that the same faces of Black Americans elicited more negative automatic responses when the faces were presented on the background of an urban street scene rather than a church scene. More recent research has started to document the effects of other ambient features of the environment in person perception and judgment. Namely, Semin and Garrido (2012) found that environmental contexts characterized by warm temperature, close distance and pleasant smells promoted generalized positive evaluations not only of a social target but also of uninvolved others such as the experimenter in contrast to the cold, distant and unpleasant smell conditions. Overall, this kind of evidence demonstrates that the context has the capacity to influence the meaning attributed to interpersonal situations.

Most of Marketing research assumes that the consumer experience is based in functional, human, and mechanic clues (e.g., Wall & Berry, 2007). “Functional” clues concern the technical quality of the service provided, the “human” clues consist of the

behavior of staff and how that makes costumers feel, and the “mechanic” clues are nonhuman elements present in the environment, such as design, and ambient features. The latter two dimensions provide clues that contribute to consumers’ perceptions of the quality of the service, and Marketing researchers argue that these clues are especially important towards intangible services, which evaluation is difficult (Bitner, 1990; Wall & Berry, 2007) – as we can consider hospital services. To give just an example, the extent of the effect of mechanic clues was demonstrated in an interesting experimental study from Bitner (1990). This study found that when employees had clean, and organized desks, travel agency customers were less likely to attribute service failures to the companies, and less likely to expect the failure to occur again in the future.

Thus, despite work environments permit less forms of self-expression compared to a place like home, still its physical environment convey information about its occupants. Hospital staff – in particular – may have limited control over the physical environment of the hospital rooms or waiting rooms. However, research suggests that patients believe that the hospital environment is at least partially the responsibility of health care providers, and that they may be able to take some actions that might help improve conditions in patients’ hospital rooms (Gotlieb, 2002). In fact, studies indicate that, if somehow the environment communicates that the doctors, nurses, and staff care about its appearance and function themselves, and maintain it with the patients in mind, it is likely that patients form a positive image of the providers and of the healthcare system as a whole (Arneill & Devlin, 2002). In other words, if patients notice that healthcare providers (or someone connected to them) put time, thought, and care into the hospital environment it may be interpreted that they care for patients well-being and comfort and that they will put the same quality into the “technical” care that is given. What is fascinating is that these impressions can be conveyed in subtle ways.

We started this section by stating that perceptions of the hospital physical and social environments may influence each other, but researchers have not yet examined if people (their behavior, attitudes, etc.) also provide meaning to the qualities of the physical environment where they live/work. However, given that a number of studies show that the attributes of the physical environment (e.g., cleanliness) are associated to certain personality traits (e.g., intelligence; Harris & Sachau, 2005), and that from those attributes observers also make inferences about people behaviors and intentions (e.g., Bitner, 1990), it is likely that this relationship is mutual, and that people behaviors influence observers’ interpretations about the physical environments they occupy. Thus,

it can be hypothesized that having information about the good qualities of a hospital's social environment or particular healthcare providers, may set similar expectations regarding the quality of physical environment. In this thesis this hypothesis will be examined.

Following, how – in an interactional situation –do physical and social information play together? How do people put together all this information to create an overall impression, for example, when they are inconsistent? This question was not yet examined in the literature on healthcare environments. Proshansky (1983) argued that the quality of a physical setting is a function of the quality of the social context of which it is a part. Thus, “the ‘best and finest’ physical setting [...] may not be enough” if the social environment is not appropriate. In that case, the physical properties of the setting recede in importance and their once very minor defects become perceived as major ones. On the other hand, a very poor setting may be viewed positively if the social cognition is very rewarding. According to Proshansky, Fabian and Kaminoff (1983), is “only when a physical setting becomes dysfunctional that a person becomes aware of his or her expectations for that setting. What was routine and in the background suddenly becomes the 'figure' in the thinking of those using the setting” (p.75). The idea that the physical environment has an effect especially when it is inadequate is consistent with Herzberg's notion of the physical environment as a “hygiene” or “context” factor. In Herzberg's theory (Herzberg, 1987), environmental factors, as context factors, can at best create no dissatisfaction when they are present, or create dissatisfaction if they are inadequate or absent.

Some empirical evidence from research on healthcare environments tends to corroborate this idea. The previously mentioned study of Arneill and Devlin (2002) used photographs of waiting rooms. It was found that in the open-ended questions participants had more to say and more specific comments about the aspects of waiting rooms they disliked than about the aspects they liked. For waiting rooms rated more positively, many of the comments were limited to one or two general words. Devlin (1995) reported similar findings. When asked about what they liked about being in the care unit, an overwhelming percentage of the patients' comments were about what needed improvement, and very few positive comments about the environment were made. Thus, Devlin (1995) suggested that the environment was viewed as capable of producing reactions of dissatisfaction rather than satisfaction. In other words, patients may expect a certain level of quality in the environment, and therefore may only

become aware of it when the quality is poor. The hypothesis that the effect of the physical environment may vary according to the level of quality of the social environment was never tested, and thus will be part of our research program.

5. Measuring hospital experience - the users' point of view

The need to include patient's opinions in healthcare services management and assessment encouraged managers to monitor patients' satisfaction. As mentioned at the beginning of this chapter, this practice is part of a wider social movement towards a care centered in the patient, who is also increasingly viewed as a consumer (Sitzia & Wood, 1997).

The patients' hospital experience has been assessed through the measurement of patient satisfaction, and usually patient satisfaction is measured using quantitative (rating scales) surveys. Some studies have measured satisfaction using only one item to assess overall satisfaction (e.g., Harmsen, Bernsen, Bruijnzeels, & Meeuwesen, 2008; Sun et al., 2000). Other surveys include multiple specific domains as well as global ratings. Because there is enormous diversity of healthcare settings and issues may be specific to particular settings, few questionnaires have become "standard" in the sense of being widely and regularly used. Moreover, different aspects of medical care are measured with extremely uneven frequencies in satisfaction instruments. In an interesting meta-analysis, Hall and Dornan (1988) reviewed 107 studies, and found that satisfaction with the facilities was only assessed in 16% of them. The most frequently measured aspects of satisfaction were the provider's "humaneness", and "informativeness" (measured in 65%, and 50% of the studies, respectively).

Nevertheless, there are a few instruments that have been quite widely and regularly applied (Fitzpatrick, 2007). HCAHPS, for example, include domains such as access to care; doctor-patient communication and interaction; respect, courtesy and helpfulness of office staff; and health plan service information and paperwork. Under the heading "Hospital Environment" it has only two questions related to the physical environment: "how often were your room and bathroom kept clean?"; and "how often was the area around your room quiet at night?" (Devlin, 2010). These two questions do not tap into many other aspects of the hospital environment that may be related to health care outcomes. SERVQUAL (Parasuraman, Zeithaml, & Berry, 1988) is a questionnaire

with five scales (reliability, responsiveness, assurance, empathy, and tangibility) based on the disconfirmation paradigm of satisfaction. In this instrument the physical environment is represented within the tangibility scale, together with other aspects such as meals and appearance of staff.

To carry out our research program we needed a valid and reliable measure of the perceived quality of healthcare environment, especially the physical environment. Given this special focus, a measure on the quality of different specific aspects of the physical environment, as perceived by users, seemed appropriate.

The subjective evaluation of environmental quality refers to the point of view of the users, and relies on self-report tools through which people express their perceptions, thus offering a measure of the quality of the environment as it is experienced (Bonaiuto & Alves, 2012). The perception and evaluation of the environments we occupy is a basic daily-experience (Zube, 1984), and has been traditionally addressed within Environmental Psychology. As we spontaneously create impressions of the people we interact with, also the environments where we go (e.g., a friends' house, a new restaurant) or that we choose for us (e.g., house, hotel, hospital) are subject to evaluation. The interest on this research topic relates with the fact that the environmental properties of the places with which people interact with correlate with their satisfaction, well-being, and quality of life (Bonnes & Secchiaroli, 1995).

The notion of person-environment fit has to do with the result of the match between people's objectives and activities in an environment, versus to what extent the environment facilitates or inhibits them (and thus producing an increase or a decrease on well-being, respectively). For Horelli (2006), this fit can be expressed and operationalized by people' perceptions of environmental quality.

The perceived environmental quality (PEQ) as judged by users is typically measured through a self-report scale asking for subjective assessment of various single physical and social (interpersonal) features of a particular environment. Accordingly, there have been developed a number of indices on perceived environmental quality for assessing different kind of environments, such as: residential (e.g., Bonaiuto, Fornara, & Bonnes, 2003), work, and institutional environments (e.g., Moos & Lemke, 1984). As a measure of average responses of a group of users, PEQ may be a component of environmental impact assessment, or provide baseline data for evaluating environmental intervention programs. It can also facilitate comparison of trends in the same environment over time, comparison of different environments over time, and detection

of aspects of the environment that observers use in assessing quality (Bell, Greene, Fisher, & Baum, 2001).

According to Fornara, Bonaiuto, and Bonnes (2006) there was a great lack of tools for measuring environmental quality in healthcare environments. To bridge this gap these authors developed PHEQIs (Perceived Hospital Environment Quality Indicators) based in studies carried out in various Italian hospital units. PHEQIs contain scales focusing on the physical (external spaces, and in-/out-patient areas), and the social environment. Thus, although the practical utility of this instrument is mostly related to the assessment of hospital physical environment qualities, it also focuses on the social and functional aspects of the environment.

This instrument appeared to be appropriate to the objectives of our project, and, thus, the first study of the present thesis aimed at adapting and validating the scales of PHEQIs. First, because – to the best of our knowledge – PHEQIs scales represent one of the few instruments created to measure hospital users' EQP; second, because the factor structure of the scales were never tested with confirmatory factor analysis; and third, because we aimed to contribute to the development of a culture-general measure, with the potential to become a widely used and valued measure in the field. Therefore, the first step of this research program was to adapt and validate PHEQIs.

6. The present research program

The present thesis aims to contribute to the understanding of the role of the healthcare physical environment on patients' experience. Research on healthcare environments has produced a cumulative body of empirical evidence showing that objective aspects of the physical environment (e.g., view from the window, e.g., Ulrich (1984); and aesthetically pleasing settings, e.g., Leather et al., 2003) lead to patients' satisfaction, emotional well-being and other positive outcomes. Although research indicates that the physical environment has important consequences on physiological and more directly recovery-related variables (e.g., Hagerman et al., 2005), in this thesis we will be focusing on subjective self-report measures as indicators of patients' well-being. In other words, we are especially interested in patients' perceptions of the hospital experience. We've argued that patients are becoming more demanding, as they realize they have more options for care, and become aware of their role as healthcare

consumers. Consequently, it is important to determine how healthcare environments can promote positive experiences to patients. Moreover, we have reviewed studies that show that satisfaction with care is often correlated with important outcomes such as treatment adherence.

Although it is widely recognized that healthcare physical environment can have an impact on patients' subjective and objective outcomes, there are still several avenues to explore. This thesis aims to address some of the questions that have been neglected. For example, we still don't know much about what are the conditions under which the physical environment matters, or its underlying mechanisms (i.e., mediating and moderating processes). The physical environment rarely has a direct, one-to-one correspondence with individual outcomes that is uniform across all individuals or social settings (Winkel, Saegert, & Evans, 2009). Hence, detecting the mediating and moderating processes underlying the relationship between healthcare physical environment and patients' outcomes is needed to better map how and when this relationship occurs and, thus, to more successfully accomplish practical interventions. Another aspect that has been neglected in Environmental Psychology in general (Winkel et al., 2009), and in healthcare environments research in particular, is the relative contributions of the physical and social environments to the outcome variance (Winkel et al., 2009), especially in correlational studies. Furthermore, the development of a reliable and valid measure on hospital environmental quality perception is important both for research and practice. In order to address these issues, we planned four studies, which will be presented in three separate chapters.

In the first empirical chapter (**Chapter 2**), we present the adaptation and validation of a measure on hospital environmental quality perception, the Perceived Hospital Environment Quality Indicators (PHEQIs; Fornara, Bonaiuto, & Bonnes, 2006) (Study 1). In particular, we tested the factor structure of three scales developed in studies carried out in Italian hospital units – two focusing on physical environments and one evaluating the social environment – in a different cultural context, using a Portuguese sample. It was hypothesized that the original factor structures of PHEQIs scales would be replicated, indicating that hospital environmental quality perception can be measured through ten environmental dimensions related to external spaces, in-/out-patient area, and social-functional features. To do so, the items of the three PHEQIs scales were submitted to a confirmatory factorial analysis, and the adequacy of the measurement models was tested.

The second empirical chapter (**Chapter 3**) presents a field study undertaken to investigate how the health care physical environment is related to well-being (Study 2). Specifically, we tested if satisfaction with the care unit is a result of, in hospital areas with more objective environmental quality, the physical environment and social environment being evaluated as having higher quality. In other words, we examined whether the perceptions of patients on the quality of physical and social environments mediate the relationship between health care physical conditions and satisfaction with the care unit. Moreover, we tested if this process is moderated by patients' status, namely, if the objective physical environment impacts inpatients' and outpatients' satisfaction by different social-psychological processes.

In the last empirical chapter (**Chapter 4**) we report two experimental laboratorial studies. These studies were designed to overcome some limitations that correlational studies have, which prevent more definitive conclusions about the unique role of the quality of hospitals' physical environment. The main goal of Study 1 was to investigate the inferences people make about the quality of the hospital environment and expected well-being based on partial information (only about the physical or only about the social environment) (Study 3). Research has shown that people infer the quality of the healthcare social environment from information about the physical environment (e.g., Arneill & Devlin, 2002), but the opposite relationship has not been addressed. We propose that information about the healthcare social environment also creates expectations about the quality of the physical environment. The objective of Study 4 was to disentangle the contribution of the quality of physical and social environments on well-being. The main hypothesis was that the health care physical and social environments have an independent effect on well-being.

The next three chapters report this research. Each of these chapters is based on an article that was either published (Chapter 2) or is under review (Chapters 3, and 4). These chapters can be read independently and in any order. Following these three chapters, **Chapter 5** presents an integrated discussion where we address the main contribution of our work and what in our view has yet to be addressed.

7. References

- Altman, I. (1976). Privacy: A Conceptual Analysis. *Environment and Behavior*, 8(1), 7–30. doi:10.1177/001391657600800108.
- Andaleeb, S. S., Siddiqui, N., & Khandakar, S. (2007). Patient satisfaction with health services in Bangladesh. *Health Policy and Planning*, 22(4), 263–73. doi:10.1093/heapol/czm017
- Ancarani, A., Di Mauro, C., & Giammanco, M. D. (2009). How are organisational climate models and patient satisfaction related? A competing value framework approach. *Social Science & Medicine*, 69(12), 1813–8. doi:10.1016/j.socscimed.2009.09.033
- Arneill, A. B., & Devlin, A. S. (2002). Perceived quality of care: The influence of the waiting room environment. *Journal of Environmental Psychology*, 22(4), 345–360. doi:10.1006/jevp.2002.0274
- Ayers, S. & Steptoe, A. (2007) Stress & health. In S. Ayers, A. Baum, C. McManus, S. Newman, K. Wallston, J. Weinman, & R. West (Eds.) *Cambridge Handbook of Psychology, Health and Medicine* (2nd Edition). Cambridge: Cambridge University Press.
- Baillie, L. (2009). Patient dignity in an acute hospital setting: A case study. *International Journal of Nursing Studies*, 46(1), 23–36. doi:10.1016/j.ijnurstu.2008.08.003
- Bartlett, E. E., Grayson, M., Barker, R., Levine, D. M., Golden, A., & Libber, S. (1984). The effects of physician communications skills on patient satisfaction; recall, and adherence. *Journal of Chronic Diseases*, 37(9-10), 755–64.
- Becker, F. D., Gield, B., & Froggatt, C. C. (1983). Seating position and impression formation in an office setting. *Journal of Environmental Psychology*, 3(3), 253–261.

- Becker, F. D., Sweeney, B., & Parsons, K. (2008). Ambulatory facility design and patients' perceptions of healthcare quality. *Health Environments Research & Design Journal*, 1(4), 35–54.
- Bell, P. A., Greene, T. C., Fisher, J.D., & Baum, A. (2001). *Environmental Psychology* (5th ed.). Fort Worth: Harcourt College Publishers.
- Bitner, M. (1990). Evaluating service encounters: The effects of physical surrounding and employee responses. *The Journal of Marketing*, 54(2).
- Bonaiuto, M., & Alves, S. (2012). Residential places and neighborhoods: Towards healthy life, social integration, and reputable residence. In S. Clayton (Ed.), *The Oxford Handbook of Environmental and Conservation Psychology* (pp. 221-247). New York: Oxford University Press.
- Bonaiuto, M., Fornara, F., & Bonnes, M. (2003). Indexes of perceived residential environment quality and neighbourhood attachment in urban environments: A confirmation study on the city of Rome. *Landscape and Urban Planning*, 65(1-2), 41–52. doi:10.1016/S0169-2046(02)00236-0
- Bonnes, M., & Secchiaroli, G. (1995). *Environmental Psychology. A psycho-social introduction*. London: Sage.
- Borrell-Carrió, F., Suchman, A. L., & Epstein, R. M. (2004). The biopsychosocial model 25 years later: Principles, practice, and scientific inquiry. *The Annals of Family Medicine*, 2(6), 576–582. doi:10.1370/afm.245
- Bower, P. & Mead, N. (2007). Patient-centred healthcare. In A. Baum et al. (Eds), *Cambridge Handbook of Psychology, Health and Medicine* (2nd ed.) (pp. 468-471). Cambridge: Cambridge University Press.
- Bromley, E. (2012). Building patient-centeredness: Hospital design as an interpretive act. *Social Science & Medicine*, 75, 1057-1066. doi:10.1016/j.socscimed.2012.04.037
- Carpman, J. R. & Grant, M. A. (1993). *Design that cares: Planning health facilities for patients and visitors* (2nd ed.). Chicago: American Hospital Association.

- Chaudhury, H., Mahmood, A., & Valente, M. (2005). Advantages and disadvantages of single- versus multiple-occupancy rooms in acute care environments: A review and analysis of the literature. *Environment and Behavior*, *37*(6), 760–786. doi:10.1177/0013916504272658
- Cho, W. H., Lee, H., Kim, C., Lee, S., & Choi, K.-S. (2004). The impact of visit frequency on the relationship between service quality and outpatient satisfaction: A South Korean study. *Health Services Research*, *39*(1), 13–33. doi:10.1111/j.1475-6773.2004.00213.x
- Cohen, S., Frank, E., Doyle, B. J., Skoner, D. P., Rabin, B. S. & Gwaltney, J. M. (1998). Types of stressors that increase susceptibility to the common cold. *Health Psychology*, *17*, 214-223.
- Cvengros, J. A, Christensen, A. J., Cunningham, C., Hillis, S. L., & Kaboli, P. J. (2009). Patient preference for and reports of provider behavior: Impact of symmetry on patient outcomes. *Health Psychology*, *28*(6), 660–7. doi:10.1037/a0016087
- Devlin, A. S. (1995). Staff, patients, and visitors: Responses to hospital unit enhancements. *Environmental Design Research Association*, 113–117.
- Devlin, A. S. (2008). Judging a book by its cover: Medical building facades and judgments of care. *Environment and Behavior*, *40*(3), 307–329. doi:10.1177/0013916507302242
- Devlin, A. S. (2010). *What Americans build and why - Psychological perspectives*. New York: Cambridge University Press.
- Devlin, A. S., & Arneill, A. B. (2003). Health care environments and patient outcomes: A review of the literature. *Environment and Behavior*, *35*, 665–694. doi:10.1177/0013916503255102
- Devlin, A. S., Donovan, S., Nicolov, A., Nold, O., Packard, A., & Zandan, G. (2009). “Impressive?” Credentials, family photographs, and the perception of therapist qualities. *Journal of Environmental Psychology*, *29*(4), 503–512. doi:10.1016/j.jenvp.2009.08.008

- Dijkstra, K., Pieterse, M., & Pruyn, A. (2008a). Stress-reducing effects of indoor plants in the built healthcare environment: The mediating role of perceived attractiveness. *Preventive Medicine*, 47(3), 279-283. doi:10.1016/j.ypmed.2008.01.013
- Dijkstra, K., Pieterse, M., & Pruyn, A. (2008b). Individual differences in reactions towards color in simulated healthcare environments: The role of stimulus screening ability. *Journal of Environmental Psychology*, 28(3), 268–277. doi:10.1016/j.jenvp.2008.02.007
- Dougall, A. L., & Baum, A. (2001). Stress, health and illness. In A. Baum, T. A. Revenson, & J. E. Singer (Eds.), *Handbook of health psychology* (pp. 321-337). Mahwah, NJ: Lawrence Erlbaum Associates.
- Ebrecht, M., Hextall, J., Kirtley, L.-G., Taylor, A., Dyson, M., & Weinman, J. (2004). Perceived stress and cortisol levels predict speed of wound healing in healthy male adults. *Psychoneuroendocrinology*, 29(6), 798–809. doi:10.1016/S0306-4530(03)00144-6
- Eisen, S. (2007). Patient satisfaction assessment. In S. Ayers, A. Baum, C. McManus, S. Newman, K. Wallston, J. Weinman & R. West (Eds.), *Cambridge Handbook of Psychology, Health and Medicine* (2nd ed.) (pp. 304-308). Cambridge: Cambridge University Press.
- Engel, G. L. (1977). The need for a new medical model: A challenge for biomedicine. *Science*, 196(4286), 129–136.
- Engel, G. L. (1980). The clinical application of the biopsychosocial model. *American Journal of Psychiatry*, 13(5), 535.
- Erger, J. S. & Marelich, W. D. (2004). Health care settings and their social dynamics. In W. D. Marelich & J. S. Erger (Eds.), *The Social Psychology of Health: Essays and Readings* (pp. 163-168). California: Sage.
- Evans, G. W., & McCoy, J. M. (1998). When buildings don't work: The role of architecture in human health. *Journal of Environmental Psychology*, 18, 85–94.

- Fitzpatrick, R. (2007). Patient satisfaction. In S. Ayers, A. Baum, C. McManus, S. Newman, K. Wallston, J. Weinman & R. West (Eds.), *Cambridge Handbook of Psychology, Health and Medicine* (2nd ed.) (pp. 477-481). Cambridge: Cambridge University Press.
- Fornara, F. (2005). Users' Evaluative Responses to Spatio-Physical Humanization: The Case of Hospital Environments. In B. Martens, A. G. Keul (Eds.), *Designing Social Innovation: Planning, Building, Evaluating* (pp. 231-240). Gottingen (Germany): Hogrefe & Huber.
- Fornara, F., Bonaiuto, M., & Bonnes, M. (2006). Perceived hospital environment quality indicators: A study of orthopaedic units. *Journal of Environmental Psychology*, 26(4), 321–334. doi:10.1016/j.jenvp.2006.07.003
- Fornara, F., & Andrade, C. C. (2012). Healthcare environments. In S. Clayton (Ed.), *The Oxford Handbook of Environmental and Conservation Psychology* (pp. 295-315). New York: Oxford University Press.
- Gosling, S. D., Ko, S. J., Mannarelli, T., & Morris, M. E. (2002). A room with a cue: Personality judgments based on offices and bedrooms. *Journal of Personality and Social Psychology*, 82(3), 379–398. doi:10.1037//0022-3514.82.3.379
- Gotlieb, J. B. (2000). Understanding the effects of nurses, patients' hospital rooms, and patients' perception of control on the perceived quality of a hospital. *Health Marketing Quarterly*, 18(1-2), 1–14. doi:10.1300/J026v18n01_01
- Gotlieb, J. B. (2002). Understanding the effects of nurses on the process by which patients develop hospital satisfaction. *Holistic Nursing Practice*, 16(5), 49–60.
- Grosenick, J., & Hatmaker, C. (2000). Perceptions of the importance of physical setting in substance abuse treatment. *Journal of Substance Abuse Treatment*, 18, 29–39.
- Hagerman, I., Rasmanis, G., Blomkvist, V., Ulrich, R. S., Eriksen, C. A., & Theorell, T. (2005). Influence of intensive coronary care acoustics on the quality of care and physiological state of patients. *International Journal of Cardiology*, 98(2), 267–70. doi:10.1016/j.ijcard.2003.11.006

- Hall, J., & Dornan, M. (1988). What patients like about their medical care and how often they are asked: A meta-analysis of the satisfaction literature. *Social Science & Medicine*, 27(9), 935–939.
- Hall, J., & Dornan, M. (1990). Patient sociodemographic characteristics as predictors of satisfaction with medical care: A meta-analysis. *Social Science & Medicine*, 30(7), 811–818.
- Hamilton, K. (2003). The four levels of evidence-based design practice. *Healthcare Design*, 3, 18–26.
- Harmsen, J. A. M., Bernsen, R. M. D., Bruijnzeels, M. A., & Meeuwesen, L. (2008). Patients' evaluation of quality of care in general practice: What are the cultural and linguistic barriers? *Patient Education and Counseling*, 72(1), 155–62. doi:10.1016/j.pec.2008.03.018
- Harris, P. B., McBride, G., Ross, C., & Curtis, L. (2002). A Place to heal: Environmental sources of satisfaction among hospital patients. *Journal of Applied Social Psychology*, 32(6), 1276–1299. doi:10.1111/j.1559-1816.2002.tb01436.x
- Harris, P. B., & Sachau, D. (2005). Is cleanliness next to godliness?: The role of housekeeping in impression formation. *Environment and Behavior*, 37(1), 81–101. doi:10.1177/0013916504266803
- Haskard, K. B., Williams, S. L., DiMatteo, M. R., Rosenthal, R., White, M. K., & Goldstein, M. G. (2008). Physician and patient communication training in primary care: Effects on participation and satisfaction. *Health Psychology*, 27(5), 513–22. doi:10.1037/0278-6133.27.5.513
- Hekkert, K. D., Cihangir, S., Kleefstra, S. M., Van den Berg, B., & Kool, R. B. (2009). Patient satisfaction revisited: A multilevel approach. *Social Science & Medicine*, 69(1), 68–75. doi:10.1016/j.socscimed.2009.04.016
- Henderson, A., Van Eps, M. A., Pearson, K., James, C., Henderson, P., & Osborne, Y. (2009). Maintenance of patients' dignity during hospitalization: Comparison of staff-patient observations and patient feedback through interviews. *International*

Journal of Nursing Practice, 15(4), 227–30. doi:10.1111/j.1440-172X.2009.01764.x

Herzberg, F. (1987). One more time: How do you motivate your employees? *Harvard Business Review*, (September-October), 5–16.

Hill, M. H., & Doddato, T. (2002). Relationships among patient satisfaction, intent to return, and intent to recommend services provided by an academic nursing center. *Journal of Cultural Diversity*, 9(4), 108-112.

Horelli, L. (2006). Environmental human-friendliness as a contextual determinant for quality of life. *Revue Européenne de Psychologie Appliquée/European Review of Applied Psychology*, 56(1), 15–22. doi:10.1016/j.erap.2005.02.012

Irurita, V. F. (1999). Factors affecting the quality of nursing care: The patient's perspective. *International Journal of Nursing Practice*, 5, 86–94.

Ittelson, W. H., Proshansky, H. M., & Rivlin, L. G. (1970). Bedroom size and social interaction of the psychiatric ward. *Environment and Behavior*, 2(3), 255–270.

Ittelson, W. H., Proshansky, H. M., Rivlin, L. G. (1970). The environmental psychology of the psychiatric ward. In H. M. Proshansky, W. H. Ittelson, L. G. Rivlin (Eds.). *Environmental Psychology: Man and His Physical Setting* (pp. 419–439). New York: Holt, Rinehart & Winston.

Jin, J., Sklar, G., Oh, V., & Li, S. (2008). Factors affecting therapeutic compliance: A review from the patient's perspective. *Therapeutics and Clinical Risk Management*, 4(1), 269–286.

Joffe, S., Manocchia, M., Weeks, J. C., Cleary, P. D., Manocchia, N., & Geary, P. D. (2003). What do patients value in their hospital care? An empirical perspective on autonomy centred bioethics. *Journal of Medical Ethics*, 29(2), 103–108.

Johnston, M. (1980). Anxiety in surgery patients. *Psychological Medicine*, 10, 145–52.

Johnston, M., & Vogele, C. (1993). Benefits of psychological preparation for surgery: A meta-analysis. *Annals of Behavioral Medicine*, 15, 245–256.

- Keep, P., James, J., & Inman, M. (1980). Windows in the intensive therapy unit. *Anaesthesia*, 35(3), 257–62.
- Kreps, G. L., Arora, N. K., & Nelson, D. E. (2003). Consumer/provider communication research: Directions for development. *Patient Education and Counseling*, 50(1), 3–4. doi:10.1016/S0738-3991(03)00070-3
- Kvåle, K., & Bondevik, M. (2008). What is important for patient centred care? A qualitative study about the perceptions of patients with cancer. *Scandinavian Journal of Caring Science*, 22, 582–589. doi:10.1111/j.1471-6712.2007.00579.x
- Laufer, R. S., Proshansky, H. M., & Wolfe, M. (1976). Some analytic dimensions of privacy. In H. M. Proshansky, W. H. Ittelson, & L. G. Rivlin (Eds.), *Environmental psychology: People and their physical settings* (2nd ed.) (pp. 206–217). New York: Holt, Rinehart & Winston.
- Leather, P., Beale, D., Santos, A., Watts, J., & Lee, L. (2003). Outcomes of environmental appraisal of different hospital waiting areas. *Environment and Behavior*, 35(6), 842–869. doi:10.1177/0013916503254777
- Lima, M. L., Sautkina, E. (2007). Psicologia ambiental: um esboço sobre o seu desenvolvimento em Portugal e no mundo. *Psicologia*, XXI, 5-15.
- Lin, Y.-K., & Lin, C.-J. (2011). Factors predicting patients' perception of privacy and satisfaction for emergency care. *Emergency Medicine Journal*, 28(7), 604–8. doi:10.1136/emj.2010.093807
- Lyons, A. C. & Chamberlain, K. (2006). *Health Psychology: A Critical Introduction*. Cambridge: Cambridge University Press.
- Maes, S., Leventhal, H. & Johnston, M. (1992). *International Review of Health Psychology*, vol. 1. Chichester, United Kingdom: John Wiley & Sons.
- Margulis, S. T. (2003). On the status and contribution of Westin's and Altman's theories of privacy. *Journal of Social Issues*, 59(2), 441-429.
- Marquis, M. S., Davies, A. R., & Ware, J. E. (1983). Patient satisfaction and change in medical care provider: A longitudinal study. *Medical Care*, 21(8), 821–829.

- Marucha, P., Janice, K., & Favagehi, M. (1998). Mucosal wound healing is impaired by examination stress. *Psychosomatic Medicine*, *60*, 362–365.
- Maslow, A. H., & Mintz, N. L. (1956). Effects of esthetic surroundings: Initial effects of three esthetic conditions upon perceiving “energy” and “well-being” in faces. *Journal of Psychology*, *41*, 247–254.
- Matiti, M. R., & Trorey, G. M. (2008). Patients’ expectations of the maintenance of their dignity. *Journal of Clinical Nursing*, *17*(20), 2709–17. doi:10.1111/j.1365-2702.2008.02365.x
- Moos, R. H., & Lemke, S. (1984). *Multiphasic environmental assessment procedure: Manual*. Palo Alto, CA: Social Ecology Laboratory, Veterans Administration and Stanford University Medical Center.
- Mowen, J. C., Licata, J. W., & McPhail, J. (1993). Waiting in the emergency room: How to improve patient satisfaction. *Journal of Health Care Marketing*, *13*(2), 26–33.
- Mpinga, E. K., & Chastonay, P. (2011). Satisfaction of patients: A right to health indicator? *Health Policy*, *100*(2-3), 144–50. doi:10.1016/j.healthpol.2010.11.001
- Munafò, M. R., & Stevenson, J. (2001). Anxiety and surgical recovery. Reinterpreting the literature. *Journal of Psychosomatic Research*, *51*(4), 589–96.
- Nasar, J. L., & Devlin, A. S. (2011). Impressions of psychotherapists’ offices. *Journal of Counseling Psychology*, *58*(3), 310–20. doi:10.1037/a0023887
- Oflaz, F., & Vural, H. (2010). The evaluation of nurses and nursing activities through the perceptions of inpatients. *International Nursing Review*, *57*(2), 232–9. doi:10.1111/j.1466-7657.2009.00772.x
- Ogden, J. (2002). *Psicologia da Saúde* (2ª ed.). Lisboa: Climepsi Editores.
- Ong, L. M., De Haes, J. C., Hoos, A. M., & Lammes, F. B. (1995). Doctor-patient communication: A review of the literature. *Social Science & Medicine*, *40*(7), 903–18.

- Osmond, H. (1957). Functions as the basis of psychiatric ward design. *Mental Hospital*, 8, 23–30.
- Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring customer perceptions of service quality. *Journal of Retailing*, 64, 12–40.
- Park, S. H., & Mattson, R. H. (2009). Ornamental indoor plants in hospital rooms enhanced health outcomes of patients recovering from surgery. *The Journal of Alternative and Complementary Medicine*, 15, 975–980.
- Peersman, G. (2001). Promoting health: Principals of practice and evaluation. In S. Oliver & G. Peersman (Eds), *Using Research for Effective Health Promotion* (pp. 3-15). Philadelphia: Open University Press.
- Pol, E. (2007). Blueprints for a history of Environmental Psychology (II): From Architectural Psychology to the challenge of sustainability. *Medio Ambiente y Comportamiento Humano*, 8(1, 2), 1–28.
- PORDATA (2012a). *2010 Inquérito aos Hospitais e Inquérito aos Centros de Saúde topic based tabulations: consultas, internamentos e urgências in 2010*. Retrieved in July 27th from PORDATA: <http://www.pordata.pt/Portugal/Estabelecimentos+de+saude+consultas++internamentos+e+urgencias-150>
- PORDATA. (2012b). *2010 Relatório/publicação "Conta Geral do Estado": execução orçamental*. Retrieved in July 27th from PORDATA: <http://www.pordata.pt/Portugal/Estabelecimentos+de+saude+consultas++internamentos+e+urgencias-150>
- Portugal, S. (2005). “*Quem tem amigos tem saúde*”: *O papel das redes sociais no acesso aos cuidados de saúde*”, Paper presented at Oficina do CES.
- Powell, R. & Johnston, M. (2007). Hospitalisation in adults. In S. Ayers, A. Baum, C. McManus, S. Newman, K. Wallston, J. Weinman & R. West (Eds.). *Cambridge Handbook of Psychology, Health & Medicine* (2nd ed.). Cambridge: Cambridge University Press.

- Proshansky, H. M., Fabian, A. K., & Kaminoff, R. D. (1983). Place identity: Physical world socialization of the self. *Journal of Environmental Psychology, 3*, 57–83.
- Raposo, M. L., Alves, H. M., & Duarte, P. A. (2008). Dimensions of service quality and satisfaction in healthcare: a patient's satisfaction index. *Service Business, 3*(1), 85–100. doi:10.1007/s11628-008-0055-1
- Rice, G., Ingram, J., & Mizan, J. (2008). Enhancing a primary care environment: A case study of effects on patients and staff in a single general practice. *The British Journal of General Practice, 58*(552), 465–70. doi:10.3399/bjgp08X319422
- Robson, S. (2008). Scenes from a restaurant: Privacy regulation in stressful situations. *Journal of Environmental Psychology, 28*(4), 373–378. doi:10.1016/j.jenvp.2008.03.001
- Roter, D., & Hall, J. (1989). Studies of doctor-patient interaction. *Annual Review of Public Health, 10*, 163–180.
- Rowlands, J., & Noble, S. (2008). How does the environment impact on the quality of life of advanced cancer patients? A qualitative study with implications for ward design. *Palliative Medicine, 22*(6), 768–74. doi:10.1177/0269216308093839
- Sarafino, E. P. (1990). *Health psychology: Biopsychosocial interactions*. Wiley: New York.
- Savage, R., & Armstrong, D. (1990). Effect of a general practitioner's consulting style on patients' satisfaction: A controlled study. *British Medical Journal, 301*(October), 968–970.
- Semin, G. R. & Garrido, M. V. (2012). A systemic approach to impression Formation: From verbal to multimodal processes. In J. Forgas, K. Fiedler, & C. Sedikides (Eds.), *Social Thinking and Interpersonal Behavior* (pp. 81-100). New York: Psychology Press.
- Sitzia, J., & Wood, N. (1997). Patient Satisfaction: A review of issues and concepts. *Social Science & Medicine, 45*(12), 1829–1843.

- Smith, E. R., & Mackie, D. M. (2007). *Social psychology* (3rd ed.). Philadelphia, PA: Psychology Press.
- Sommer, R., & Ross, H. (1958). Social interaction on a geriatrics ward. *International Journal of Social Psychiatry*, 4(2), 128–133. doi:10.1177/002076405800400207
- Stephens, A. & Ayers S. (2004) Stress, health, and illness. In S. Sutton, A. Baum, M. Johnston (Eds), *Sage Handbook of Health Psychology*. London: Sage Publications.
- Straub, R. (2012). *Health psychology* (3rd edition), New York: Worth Publishers.
- Sun, B. C., Adams, J., Orav, E. J., Rucker, D. W., Brennan, T. A., & Burstin, H. R. (2000). Determinants of patient satisfaction and willingness to return with emergency care. *Annals of Emergency Medicine*, 35(5), 426–34.
- Sundstrom, E., Bell, P. A., Busby, P. L., & Asmus, C. (1996). Environmental Psychology 1989 – 1994. *Annual Review of Psychology*, 47, 485–512.
- Swan, J. E., Richardson, L. D., & Hutton, J. D. (2003). Do appealing hospital rooms increase patient evaluations of physicians, nurses, and hospital services? *Health Care Management Review*, 28(3), 254–64.
- Taylor, S. E. (2011). *Health psychology* (8th ed.). New York: McGraw Hill.
- Taylor, S. E., Peplau, A. L., & Sears, D. O. (2006). *Social psychology* (12th ed.). Englewood Cliffs, NJ: Prentice Hall.
- Thi, P. L. N., Briançon, S., Empereur, F., & Guillemin, F. (2002). Factors determining inpatient satisfaction with care. *Social Science & Medicine*, 54(4), 493–504.
- Ulrich, R. S. (1984). View through a window may influence recovery from surgery. *Science*, 224, 420–421.
- Ulrich, R. S. (1991). Effects of interior design on wellness: Theory and recent scientific research. *Journal of Health Care Interior Design*, 3, 97–109.
- Ulrich, R. S. (2002). Health benefits of gardens in hospitals. *Plants for People Conference, International Exhibition Floriade* (pp. 1–10).

- Ulrich, R. S., Zimring, C., Barch, X. Z., Dubose, J., Seo, H.-B., Choi, Y.-S., Quan, X., et al. (2008). A review of the research literature on evidence-based healthcare design. *Health Environments Research and Design*, 1(3), 61–125.
- Uzzell, D., & Rätzzel, N. (2009). Transforming environmental psychology. *Journal of Environmental Psychology*, 29(3), 340–350. doi:10.1016/j.jenvp.2008.11.005
- Van Dulmen, A. M., & Bensing, J. M. (2002). Health promoting effects of the physician-patient encounter. *Psychology, Health & Medicine*, 7(3), 289–300. doi:10.1080/13548500220139421
- Villaverde Cabral, M. (2002). *Saúde e Doença em Portugal*. Lisboa: Imprensa de Ciências Sociais.
- Wall, E. A., & Berry, L. L. (2007). The combined effects of the physical environment and employee behavior on customer perception of restaurant service quality. *Cornell Hotel and Restaurant Administration Quarterly*, 48(1), 59–69. doi:10.1177/0010880406297246
- Webster, C., & Bryan, K. (2009). Older people's views of dignity and how it can be promoted in a hospital environment. *Journal of Clinical Nursing*, 18(12), 1784–92. doi:10.1111/j.1365-2702.2008.02674.x
- Weinman, J. (2007). Healthcare professional-patient communication. In S. Ayers, A. Baum, C. McManus, S. Newman, K. Wallston, J. Weinman, & R. West (Eds.) *Cambridge Handbook of Psychology, Health and Medicine* (2nd Edition) (pp. 435-439). Cambridge: Cambridge University Press.
- Williams, B., Coyle, J., & Healy, D. (1998). The meaning of patient satisfaction: An explanation of high reported levels. *Social Science & Medicine* (1982), 47(9), 1351–9.
- Winefield, H. R. (1992). Doctor-patient communication: An interpersonal helping process. In S. Maes, H. Leventhal, M. Johnston (Eds.), *International Review of Health Psychology*, Vol. 1 (pp.167-187). Chichester: Wiley.

- Winkel, G., Saegert, S., & Evans, G. W. (2009). An ecological perspective on theory, methods, and analysis in environmental psychology: Advances and challenges. *Journal of Environmental Psychology, 29*(3), 318–328. doi:10.1016/j.jenvp.2009.02.005
- Wittenbrink, B., Judd, C., & Park, B. (2001). Spontaneous prejudice in context: Variability in automatically activated attitudes. *Journal of Personality and Social Psychology, 81*(5), 815–827.
- Zimring, C. M., & Bosch, S. (2008). Building the evidence base for evidence-based design. *Environment and Behavior, 40*, 147-150.
- Zube, E. H. (1984). *Environmental evaluation: Perception and public policy*. New York: Cambridge University Press.

2

Users' views of hospital environmental quality: Validation of the Perceived Hospital Environment Quality Indicators (PHEQIs)

This chapter is based on the paper Andrade C. C., Lima, M.L., Fornara, F., & Bonaiuto, M. (2012). What Is a Hospital With Environmental Quality? - Validation and Further Development of a Hospital Environmental Quality Perception Measure. *Journal of Environmental Psychology*, 32, 97-111.

1. Abstract

Environmental Quality Perception (EQP) is an important construct used to help understand the relationship between people and the hospital environment. From a patient-centered care perspective, it is important that hospital design take into account the patients' (and other users') point of view. This paper presents the adaptation and validation of a measure of hospital EQP, the Perceived Hospital Environment Quality Indicators (PHEQIs; Fornara, Bonaiuto, & Bonnes, 2006), and seeks to confirm the factor structure of this construct in a different cultural context. Three scales, two focusing on physical environments and one evaluating the social environment, were completed by 562 users of four orthopedic units in Portuguese hospitals, two older and two recently built or renovated. To assess criterion validity, hospital physical environments were also objectively evaluated by two architects. Using a confirmatory factor analysis the three validation procedures produced acceptable fit indices in the final measurement models. Overall reliability values were satisfactory, as was the evidence for criterion validity. PHEQIs scales and factors correlated with global evaluation of the environment, supporting concurrent criterion validity; and predictive criterion validity was demonstrated given that users of older and newer hospitals differed significantly on the perception of quality of hospital EQP, and that high congruence between users' and experts' evaluations was found. Discriminant construct validity was supported, and some difficulties in showing convergent validity are discussed in terms of item formulation adequacy. Implications for research and practice are described.

Keywords: environmental quality perception, hospital, instrument adaptation and validation, user-centered design

2. Introduction

It is inescapable: the appearance of health care facilities matters to users (Devlin, 2010; Gesler, Bell, Curtis, Hubbard, & Francis 2004). After decades of research on the health care physical environment it is hard to ignore the fact that it has an impact on users' outcomes (e.g., Ulrich et al., 2008). However, despite the significant advances in the science of medicine, or perhaps because of them, hospitals, with their life-saving equipment, procedures, and technologies, are often perceived as sterile, intimidating institutions (Ulrich & Gilpin, 2003), and environmental qualities of buildings that could promote the health process have been largely neglected (Dilani, 2001). Finally, the premise that a health care facility be designed as a "curing machine" for medical conditions, rather than as an environment to promote wellness for the individual is being challenged (Arneill & Devlin, 2002), and a new generation of hospitals seem to be adopting this revised perspective. In a society where the understanding of health has expanded to encompass a holistic notion of physical, psychological, and social well-being, rather than a constrained idea of a disease-free body, it is not surprising that hospitals are changing in both form and function (Gesler et al., 2004). How should the hospital environment look to produce judgments that it is humanistic and of high quality? In this paper the basic dimensions that individuals use to represent the hospital environment have been investigated, through the adaptation and validation of a measure of hospital environmental quality perception. In the next section arguments that explain the value of such measure will be presented.

Fostering hospital environmental quality from the users' point of view: some practical considerations

To measure and understand how patients, family, and staff evaluate the hospital physical environment may be useful for architects, administrators, and researchers of healthcare environments.

The effort to conceive hospitals as facilities that benefit their users can be seen as part of the broader context of implementing a model of patient-centered care. The Planetree model, founded in 1978, is one of the pioneers in patient-centered approaches in hospitals and has been dedicated to the transformation of the health care experience for patients and their families (Arneill & Frasca-Beaulieu, 2003). The Planetree

philosophy encourages patients to become educated participants in choices regarding their care by fostering patients' access to information, promoting positive staff–patient interaction, and involving both patients and their families in the healing process (Schweitzer, Gilpin, & Frampton, 2004). An important component of this philosophy is the creation of an aesthetic, comfortable, soothing, and homelike environment conducive to well-being (Casparia, Erikssonb, & Naden, 2006; Martin et al., 1998), the benefits of which have already been confirmed through research (e.g., Devlin, 1995). The movement toward humanizing health care settings is also taking place in Europe (e.g., Dilani, 2001; Gesler et al., 2004). For instance, the recent Private Finance Initiative program of hospital building in the UK has been accompanied by a vigorous debate over what constitutes good hospital design for different stakeholders (Gesler et al., 2004). Accordingly, the need to investigate the perceptions and attitudes of users (i.e., patients and staff) of the health care built environments and to provide them the opportunity to participate in the design process is being emphasized (e.g., Douglas & Douglas, 2004; Gesler et al., 2004). Many hospital designs have been based primarily on expert discourses that emphasize efficiency in terms of costs and clinical functionality; that is, only the visions of administrators, architects, construction engineers, policy-makers, and politicians were taken into account (Gesler et al., 2004). However, it seems intuitive that a “user-centered design” (Gifford, 2002), aimed at planning and designing spaces that fit with the needs and preferences of current and potential users, must take into account what such users think. In this context, a measure that assesses users' perceptions of hospital environmental quality is valuable as a tool for architects and designers in order to 1) inform future environmental interventions, by capitalizing on what users wish to see in the environment, or to 2) determine the success of a hospital design planned to be user centered, ensuring that it satisfies users needs.

Despite the call for stronger empirical evidence showing the influence of design attributes on hospital users' well-being (e.g., Devlin & Arneill, 2003; Dijkstra, Pieterse & Pruyn, 2006; Ulrich et al., 2008; Zimring & Bosch, 2008), one can already talk about the healthcare research framework of “Evidence-Based Design” (EBD). EBD was defined as “a deliberate attempt to base design decisions on the best available research findings” (Hamilton, 2003, p.19). That is, EBD is based not only on designers' technical knowledge and requirements, but also on the information available about what is better for users (Fornara & Andrade, 2012). Therefore, we believe that the process of monitoring the reactions of users toward different design solutions might be facilitated

by the availability of a practical and relevant self-report measure on hospital environmental quality perception. The implementation of research-based solutions should be complemented by the assessment of the perceptions of the users of the targeted hospital care unit (e.g., Watkins & Keller, 2008).

Most of all, it is important to give voice to the stakeholders very often forgotten. Although there still may be some skepticism from healthcare architects and planners regarding the benefit of input from clinicians and patients in the design process (Hignett & Lu, 2008), there is an additional reason to involve the hospital users: people appreciate participating and benefit from it (Horelli, 2006; Kaplan & Kaplan, 2009). When hospital and nursing administrators listen to nurses, recognize their contribution, and allow them to participate in decision making about their physical work environment, the result can be an increase in job satisfaction and a decrease in staff stress (Applebaum, Fowler, Fiedler, Osinubi, & Ribson, 2010). For example, Becker, Sweeney, and Parsons (2008) acknowledged that the involvement of staff in the design process might influence outcomes in terms of job satisfaction. With regard to patients, Devlin and Arneill (2003) have argued how crucial it is for patients to have control over their healthcare environment. In this sense, the gesture of asking (and using) patients' views might increase patient satisfaction.

A reliable and valid measure on hospital environmental quality perception can also be useful for hospitals administrators. In a time when hospitals are actively competing for patients, when patients are becoming increasingly aware of their role as consumers of the health care they purchase, and when staff are demanding greater participation in decisions affecting their work (Becker & Poe, 1980), it is important that managers monitor users' perceptions of quality and levels of satisfaction in order to track quality improvements over time. Such data allow managers to compare their facilities to those of other health providers (when the same measures are used), and to recognize and resolve service problems in real-time (Lis, Rodeghier, & Gupta, 2011). With regard to the physical environment, patients are increasingly adopting the perspective of consumerism and consumer facility types in healthcare (e.g., Verderber & Fine, 2000) and are likely to make comparisons with other kinds of venues where comfort is being emphasized, such as airport departure lounges, ski villages, and even Ikea (Curtis, 2000, as cited in Gesler et al., 2004). The equation seems to be simple: the physical environment generates satisfaction with the service (e.g., Swan, Richardson & Hutton, 2003), as well as with the staff (e.g., Gotlieb, 2002), which are predictors of

intention to recommend and to use the hospital again (e.g., Becker, Sweeney, & Parsons, 2008; Lee & Yom, 2007; Lis, Rodeghier, & Gupta, 2011). In fact, organizations such as the Joint Commission on Accreditation of Healthcare Organization (JCAHO) are using patient satisfaction as a quality care indicator (Boudreaux, Mandry, & Wood, 2003). Further, since 2008, US hospitals' comparable data on patient satisfaction collected through a standard survey is available to the public (Hospital Consumer Assessment of Healthcare Providers and Systems, known as HCAHPS: see a discussion in Devlin, 2010), providing an opportunity to directly compare hospital patient satisfaction ratings. These examples illustrate a significant trend to ask people (patients/consumers) to report on their experiences, and a greater emphasis on quality as defined by their perceptions. In an increasingly competitive market, where healthcare consumers have more options for care, hospitals and healthcare organizations must work hard to create environments that encourage repeat visits and increase patient satisfaction (Fottler, Ford, Roberts, Ford, & Spears, 2000).

With regard to staff, a survey found that nurses based their decision to work at a hospital on a variety of factors, including the workspace in wards (CABE, 2004), and Devlin (2010) points out that increasingly modern hospitals and up-to-date facilities will lure the best doctors. As a result, administrators and managers might want to regularly examine the factors that influence the patients' and clinicians' perceptions of quality and satisfaction, as a basis for planning any changes that may be necessary.

Lastly, we propose that a measure of hospital environmental quality perception is important for researchers interested in healthcare quality, environmental psychology, or both. Since its birth, Environmental Psychology has maintained an interest in the study of healthcare environments and its implications for users (e.g., Baker, Davis, & Silvadon, 1960; Ittelson, 1960; Ittelson, Proshansky, & Rivlin, 1970; Osmond, 1957; Sommer, 1969). As a result, a growing body of research has demonstrated that the healthcare physical environment has an impact on patients' recovery and satisfaction, and on staff performance and stress. Although some deceleration in the publication of research in this area has occurred over the last few years (e.g., Sundstrom, Bell, Busby, & Amus, 1996), there is a current call for such research, with the advantage that healthcare decision makers are ready to apply it (Zimring & Bosch, 2008). In this context, the understanding of the role of the perceptions of quality in the relationship of patients, family, and staff to the hospital is important.

The influence of perceptions of the healthcare physical environment on users' health outcomes

A growing body of literature has illustrated the impact of the physical attributes of the hospital on user outcomes, such as recovery, satisfaction, hospital perception, and overall well-being (for a review, see Ulrich et al., 2008). The routes by which the physical environment exerts its influence, both direct and indirect, can be diverse. Besides the direct physiological influence (for example, the microorganisms in a carpeted floor can cause infections), the environment may act through psychological processes evolving from sensory perceptions. These processes can be of a cognitive or an emotional nature (Dijkstra, Pieterse, & Pruyn, 2006). In this paper the focus is on the cognitive processes that enable the hospital users to judge the hospital environmental quality. Specifically, the present study attempts to adapt and validate a measure of hospital environmental quality perception, namely, the Perceived Hospital Environment Quality Indicators (PHEQIs) (Fornara, Bonaiuto, & Bonnes, 2006). However, to demonstrate the important role of perception in outcomes, studies in which the role of perception of the hospital physical environment is documented will be described first.

Swan, Richardson, and Hutton (2003) investigated the effects of appealing and typical patient rooms in the same hospital on patient evaluations. The patients in the two types of rooms were matched on a number of variables and their services were equivalent (e.g., same physicians, similar housekeeping and food service). The appealing rooms were well-decorated, hotel-like, with wood furniture, decorator art, carpeted floors, crown molding, and ceramic tile baths, whereas the typical rooms were standard wardrooms with typical metal hospital beds, inexpensive family sitting chairs, and no artwork. The typical rooms were slightly smaller and noise levels were higher. Appealing rooms resulted in more positive patient evaluations of the rooms and of the physicians, as well as more favorable patient judgments about food and housekeeping services. In addition, patients in appealing rooms had stronger intentions to use the hospital again, and would recommend the hospital to others than did patients in typical rooms. Through a questionnaire mailed to discharged patients from a large hospital of a major metropolitan area, Gotlieb (2002) found some similar results. He concluded that patients' evaluation of their rooms affected their evaluation of the nurses and their hospital satisfaction.

The study of Leather, Beale, Santos, Watts, and Lee (2003) compared a pre-relocated waiting room (described as “traditional” in design) and the post-relocated waiting room (described as “nouveau”) in terms of effects on environmental appraisals, self-reported stress and arousal, satisfaction ratings, and pulse readings. They found that the new waiting area was associated with more positive environmental appraisals, but also with improved mood, an altered physiological state, and greater reported satisfaction.

One can also make reference to the experimental study of Arneill and Devlin (2002). Using photographs of waiting rooms of distinct medical offices, they showed that people can make judgments about the expected comfort as well as the quality of care they think will be delivered by the doctor. Perceived quality of care was greater for waiting rooms that were nicely furnished, well-lighted, contained artwork, and were warm in appearance versus waiting rooms that had outdated furnishings, were dark, contained no art-work or poor quality reproductions, and were cold in appearance.

The studies described demonstrate the relevance of the perceptions of patients about the hospital physical environment and show a relationship between these perceptions and evaluation of health professionals and likely care.

Some studies have also shown a relationship between hospital physical environment and staff outcomes (for a review, see Chaudhury, Mahmood, & Valente, 2009). For instance, Shepley, Harris, and White (2008) found that staff members working in single-family rooms of neonatal intensive care units are more satisfied with the physical environment, had higher job satisfaction, and lower stress than did those staff members working in an open-bay unit. Mroczek, Mikitarian, Vieira, and Rotarius (2005) showed that staff believes that certain hospital design features, such as increased natural light, have a positive impact on the quality of their work life.

These kinds of results suggest that users do not ignore the qualities of the hospital physical environment and that those perceived qualities have an influence on their well-being. Ultimately, research has shown the potentialities of the hospital physical environment to be used as a powerful instrument to create and enhance conditions for increased satisfaction and perception of quality of care, as well as to promote healthier work conditions for staff. In this context, it is important to understand the processes by which hospital users evaluate the hospital physical environment, namely the major environmental dimensions involved.

Measuring hospital environmental quality perception

The construct of *environmental quality perception* (EQP) has strict connections with the cognitive-psychological processes involved in the evaluation of environmental qualities (e.g., Bonnes & Secchiaroli, 1995; Carp & Carp, 1982; Craik & Feimer, 1987; Craik & Zube, 1976), and represents a way to operationalize the relationship between the person and the environment (Horelli, 2006). The construct has been primarily applied to the study of residential environments (e.g., Amerigo & Aragonés, 1997; Bonaiuto, Aiello, Perugini, Bonnes, & Ercolani, 1999; Bonaiuto, Fornara, & Bonnes, 2003, 2006; Carp & Carp, 1982) and, as a result, some measures of residential EQP have been developed (e.g., Perceived Residential Environment Quality Indicators - PREQIs -, Bonaiuto et al., 1999). In this context, EQP has been conceptualized as the cognitive facet of residential satisfaction and measured through a large set of specific items evaluating single features of the residential environment. In general, whenever the environmental quality of a place has been measured, it is common to focus on its physical and social attributes. For instance, the Perceived Residential Environment Quality Indicators (PREQIs) (Bonaiuto et al., 1999, 2003, 2006) include 11 scales covering specific aspects of spatial, human, functional (Canter, 1983) and contextual evaluative features (Bonnes, Bonaiuto, Aiello, Perugini, & Ercolani, 1997) at a neighborhood level. A short version of PREQIs was recently created through Confirmatory Factor Analysis technique (Fornara, Bonaiuto, & Bonnes, 2010).

EQP has also been applied to the hospital context, taking the form of the Perceived Hospital Environment Quality Indicators (PHEQIs) (Fornara, Bonaiuto, & Bonnes, 2006). This instrument aimed at covering the primary design and social attributes that are expected to play a role in the assessment of healthcare environments. PHEQIs were developed in studies carried out in various Italian hospital units (Fornara, 2005; Fornara et al., 2006) through three steps: (i) adaptation of items extracted from existing measures of perceived environmental quality designed for other specific environments (i.e., urban neighborhoods, e.g., Bonaiuto et al., 2003; residences for the elderly, e.g., Moos & Lemke, 1984); (ii) development of additional items based on six semi-structured in-depth interviews carried out with representatives of hospital users' categories (i.e., patients, staff members, and visitors); (iii) modification of the wording or depletion of items on the basis of a pilot study carried out in a hospital containing renovated and non-renovated care units. The authors used as frameworks both the multiple evaluative dimensions (spatial, human, and functional) demonstrated to be

plausible regarding neighborhood perception (Canter, 1983), and the multi-place perspective (Bonnes & Secchiaroli, 1995), which placed emphasis “*on the prevalent multiplace nature of any individual environmental or place experience and thus on the importance of looking at the interplace system of activities in order to fully understand one place’s activities, evaluations, and characteristics*” (Bonnes & Bonaiuto, 2002, p. 31).

Accordingly, the instrument published in 2006 contains four scales, three focusing on different physical environments and one evaluating the social environment: (a) spatial–physical aspects of proximal external spaces of the hospital (16 items); (b) spatial–physical aspects of the care unit (21 items); (c) spatial–physical aspects of a specific in-/out-patient (waiting) area (18 items); (d) social–functional aspects of the care unit (18 items). Principal component analyses revealed a total of 12 PHEQIs factors of quality environment perception, namely, upkeep & care, orientation, building aesthetics, and green spaces, which belong to scale (a); spatial-physical comfort, orientation, and quietness, which belong to scale (b); spatial-physical comfort, and views & lighting, which belong to scale (c); and care for social and organizational relationship, and privacy, which belong to scale (d). Although we can say that the practical utility of this instrument is related to the assessment of hospital physical environment qualities, it also focuses on the social and functional aspects of the environment, as EQP measures usually do. For Canter (1983), the experience of any place has physical and social aspects but is itself unitary. Healthcare environments in particular are places where patients’ interest is to interact with healthcare professionals; nevertheless, most of the time is spent sharing the space available with other patients, meeting not only their own but also other patients’ visitors. Therefore both social and physical components of healthcare environments need to be analyzed.

To the best of our knowledge PHEQIs scales represent one of the few instruments created to measure users’ EQP specifically in hospitals. This instrument has been used in research on healthcare environments in different types of Italian care units (e.g., Fornara, 2004, 2005; Fornara, Bonaiuto, & Bonnes, in press; Fornara & Cerina, 2011). However, the scales were developed through an exploratory factor analysis (principal component analysis) and have never been tested with confirmatory factor analysis, which would indicate the adequacy of their structures and if they need further verification. One step toward establishing the basic dimensions with which individuals represent the hospital environmental quality, and the validity and reliability of PHEQIs

scales, is to replicate its structure in another cultural context. Thus, the adaptation and validation of these scales using a Portuguese sample was the main purpose of this study. We hypothesized that the principal components obtained by Fornara and colleagues (2006) represent the factor structure underlying the construct of hospital EQP, therefore those measurement models were explicitly tested using Confirmatory Factor Analyses (CFA). CFA can be used for construct validation and scale refinement (MacCallum & Austin, 2000). In sum, the objective was to test the factorial structures of PHEQIs scales, to verify their construct and criterion validity, and to reflect on the conceptual and practical implications of hospital EQP.

Underlying this research approach and the present study in particular is the assumption that the differences in the quality perception among hospital environments are mainly due to the physical differences between them (e.g., Schelleken, 1979). Despite the many studies that have found disagreement between architects (considered experts that can make objective evaluations) and laypersons in their assessment of physical settings (e.g., Gifford, Hine, Muller-Clemm, Reynolds, & Shaw, 2000, 2002), Fornara and colleagues (2006) found a fairly good congruence between expert and lay evaluations with regard to the hospital environment. Specifically, the results showed that, in general, users' perception of environmental quality (measured by PHEQIs scales) improves when hospital humanization (obtained on the basis of the evaluation of two architects through an "expert" grid) increases. Accordingly, in the study presented here, hospitals that varied in terms of several environmental attributes were evaluated by architects. This evaluation was considered objective and was used as a criterion to evaluate PHEQIs' validity. In particular, two older and two newer hospitals were selected and evaluated by users, through PHEQIs scales, and by architects, through an observation grid. Hospital buildings of different ages were used to test the relationship between objective evaluation and levels of EQP when age varied.

Objectives and hypothesis

The main objective of the present study was to adapt and validate the Perceived Hospital Environment Quality Indicators (PHEQIs). In order to pursue this objective, the factor structure, the internal reliability, and the validity of PHEQIs scales were examined.

Specifically, it is hypothesized that the original factor structures of PHEQIs scales would be replicated, as evidence for factorial validity; that PHEQIs factors show good internal consistency, as evidence for scales' reliability; and that PHEQIs show convergent and discriminant validity, as evidence for construct validity. It is also hypothesized that PHEQIs correlate with the users' global evaluation of the environment, as evidence for concurrent validity; and that PHEQIs are sufficiently sensitive to detect differences on EQP among users of hospitals with different physical and spatial conditions, as evidence for predictive validity, both in the spatial-physical scales and in the social-functional scale (in particular, users of older hospitals were expected to report less EQP than were users of newer hospitals). Lastly, it is hypothesized that PHEQIs correlate with the experts' evaluation, as further evidence for predictive validity.

In addition, the objective is to shorten the PHEQIs scales. Hospitals are normally places where people are experiencing stress, and long and repetitive questionnaires can be annoying to some respondents, and potentially increase that feeling. Also, the large number of total items (i.e., 67) can discourage participation, or undermine the quality of collected data. A long questionnaire also limits the possibility of adding further measures in research protocols. Consequently, a shorter version of PHEQIs scales would be more appealing for professional practice and for quicker administration.

3. Method

Settings/ Places/ Hospitals

Four Portuguese hospitals were selected for this study, all with different spatial and physical conditions. In each hospital, only orthopedic units (both in-patient areas and out-patient waiting areas) were selected because PHEQIs were originally developed on the basis of a sample of orthopedic units' users (see Fornara et al., 2006). Beyond language and culture, we thus decided not to introduce any further change. The care units admit orthopedics and trauma patients. In the in-patient area, patients were hospitalized for a few days (e.g., operation recovery), whereas in the out-patient area patients went only to have a medical consultation.

To choose different orthopedic units two criteria were used: type of hospital (two general hospitals and two orthopedic hospitals) and age of the buildings (two recently built or renovated hospitals, and two older hospitals). The purpose of the first

criterion was to differentiate the sample; the second was used to evaluate criterion predictive validity.

Both the orthopedic and the general more recent hospitals had their in-patient and out-patient areas in the same main building, whereas the older hospitals had them in separate buildings. The older hospitals date from the early twentieth century and were sanitariums for tuberculosis patients before being converted into hospitals. One of them still has a predominantly pavilion structure. In relation to the more recent hospitals, one was inaugurated in 2003 and the other is located in an historic building, at one time a maritime fortification, that was undergone many renovations in recent decades. For simplification, hospitals will be designated as old-general (old G), old-orthopedic (old O), new-general (new G), and new-orthopedic (new O) (see Figs. 2.1-2.12).



Figure 2.1 External space of the old G hospital



Figure 2.4 External space of the old O hospital



Figure 2.2 In-patient area of the old G hospital



Figure 2.5 In-patient area of the old O hospital

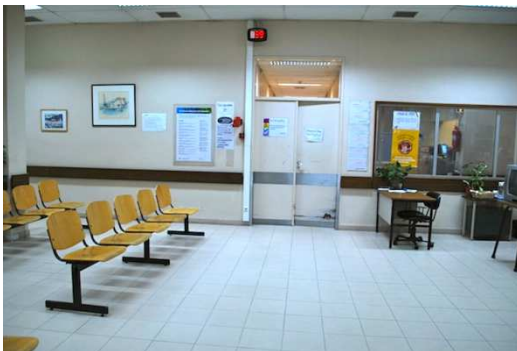


Figure 2.3 Out-patient area of the old G hospital



Figure 2.6 Out-patient area of the old O hospital



Figure 2.7 External space of the new G hospital



Figure 2.10 External space of the new O hospital



Figure 2.8 In-patient area of the new G hospital



Figure 2.11 In-patient area of the new O hospital

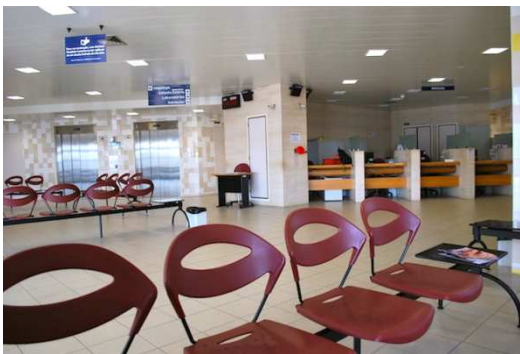


Figure 2.9 Out-patient area of the new G hospital



Figure 2.12 Out-patient area of the new O hospital

Participants

Five hundred and sixty-two hospital users participated in this study, 372 (66.8%) of whom were women. The age of the subjects ranged from 13 to 88 years with a mean age of 48 years and a standard deviation of 16.2 years. The sample was composed of patients ($n=221$), staff ($n=165$) and visitors/companions ($n=193$) that were contacted in the in-patient area ($n=310$) or in the out-patient (waiting) area ($n=252$) of one of the four orthopedic units (for characteristics of the sample by hospital area, see Table 2.1).

Instruments

In this study two instruments were used: one questionnaire for hospital users (patients, staff, and visitors) and one observation grid for the architects' technical evaluation of the hospital environmental attributes.

Questionnaire for users

The questionnaire for users contained five sections. The first section included the more recent version of the PHEQIs scales (see Appendixes A, B and C). In the recent version of the instrument Fornara and colleagues (e.g., Fornara, Bonaiuto, & Bonnes, in press) have merged the scales (b) spatial-physical aspects of the care unit, and (c) spatial-physical aspects of a specific in-/out-patient (waiting) area. The decision to merge the scales was due to the substantial overlap of their content in terms of both the wording of items and kind of participant response. As a result, some very similar items were removed (7 items). In addition, 4 new items were added. The new items aimed to increase the content validity of the scales by taking into account what emerged from open responses (provided by patients and staff) included in previous unpublished investigations of the authors.

The resulting scale has 36 items and two versions, one referring to the in-patient area, and the other referring to the out-patient waiting area. Moreover, 1 new item was added on the scale (a) spatial-physical aspects of proximal external spaces of the hospital, whereas on the scale (d) 3 items about the functional aspects of the environment were omitted (because they concerned a residual factor) and 1 new item was added. As in the case above, these changes are based both on the results of statistical analyses regarding previous data and on qualitative material collected by the authors from hospital users.

Table 2.1 Characteristics of the study participants (N=562)

<i>Inpatient Area</i>												
	Old G Hospital			Old O Hospital			New G Hospital			New O Hospital		
	<i>Patients</i>	<i>Staff</i>	<i>Visitors</i>	<i>Patients</i>	<i>Staff</i>	<i>Visitors</i>	<i>Patients</i>	<i>Staff</i>	<i>Visitors</i>	<i>Patients</i>	<i>Staff</i>	<i>Visitors</i>
<i>n</i>	41	29	28	25	26	28	19	22	22	25	19	22
Age	60.9	37.3	49.9	55.3	39.5	50.75	64.6	36.55	47.7	57.1	38.6	44.5
<i>M (SD)</i>	(17.9)	(11.3)	(17.9)	(15.2)	(13.26)	(17.24)	(14.1)	(11.8)	(15.9)	(15.7)	(12.5)	(16.1)
Gender												
Frequency <i>n (%)</i>												
Women	25 (61.0)	19 (65.5)	16(57.1)	15 (60.0)	20 (76.9)	17 (60.7)	9 (47.4)	19 (86.4)	14 (63.6)	14 (56.0)	17 (89.5)	15 (68.2)
Education <i>n (%)</i>												
Not literate	3 (7.3)	0 (0)	0 (0)	1 (4)	0 (0)	0 (0)	3 (15.8)	0 (0)	1 (4.5)	0 (0)	0 (0)	0 (0)
4 years of school	20 (48.8)	2 (6.9)	2 (7.1)	8 (32)	3 (11.5)	2 (7.7)	13 (68.4)	1 (4.5)	4 (18.2)	14 (56)	2 (10.5)	3 (13.6)
6 to 9 years of school	9 (22)	5 (17.2)	8 (28.5)	4 (16)	4 (15.4)	6 (23)	1 (5.3)	3 (13.6)	3 (13.6)	5 (20)	1 (5.3)	10 (45.5)
12 years of school	5 (12.2)	3 (10.3)	9 (32.1)	5 (20)	1 (3.8)	10 (38.5)	1 (5.3)	4 (18.2)	8 (36.4)	4 (16)	1 (5.3)	5 (22.7)
M.A and PhD degrees	4 (9.8)	19 (65.5)	9 (32.2)	7 (28)	18 (69.2)	8 (30.8)	1 (5.3)	14 (63.6)	6 (27.3)	2 (8)	15 (78.9)	4 (18.2)

(continue on next page)

Outpatient Area

	Old G Hospital			Old O Hospital			New G Hospital			New O Hospital		
	<i>Patients</i>	<i>Staff</i>	<i>Visitors</i>	<i>Patients</i>	<i>Staff</i>	<i>Visitors</i>	<i>Patients</i>	<i>Staff</i>	<i>Visitors</i>	<i>Patients</i>	<i>Staff</i>	<i>Visitors</i>
<i>n</i>	34	11	29	32	13	18	17	14	12	26	11	32
Age	52.2	40.6	49.0	46.8	42.2	44.4	53.3	43.64	42.08	49.4	37.7	44.4
M (DP)	(14.7)	(11.8)	(13.5)	(16.7)	(10.7)	(14.8)	(20.4)	(15.11)	(11.6)	(16.4)	(7.0)	(14.7)
Gender												
Frequency <i>n</i> (%)												
Women	21 (61.8)	8 (72.7)	18 (62.1)	20 (35.5)	10 (76.9)	13 (72.2)	13 (76.5)	14 (100.0)	6 (50.0)	15 (57.7)	9 (81.8)	22 (68.8)
Education <i>n</i> (%)												
Not literate	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (11.8)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
4 years of school	10 (29.4)	1 (9.1)	1 (3.4)	4 (13.3)	0 (0)	1 (5.6)	4 (23.5)	3 (21.4)	3 (27.3)	5 (19.2)	0 (0)	4 (12.9)
6 to 9 years of school	7 (20.6)	2 (18.2)	15 (51.7)	10 (33.3)	2 (15.4)	4 (22.3)	7 (41.1)	1 (7.1)	3 (27.3)	2 (7.7)	0 (0)	1 (3.2)
12 years of school	10 (29.4)	4 (36.4)	4 (13.8)	11 (36.7)	5 (38.5)	7 (38.9)	2 (11.8)	5 (35.7)	3 (27.3)	16 (61.6)	7 (63.7)	19 (61.3)
M.A and PhD degrees	7 (20.9)	4 (36.4)	9 (33.2)	4 (16.7)	6 (46.2)	6 (33.3)	2 (11.8)	5 (35.7)	2 (18.2)	3 (11.5)	4 (36.4)	7 (22.6)

In sum, the recent version of PHEQIs contains three scales, two focusing on different physical environments and one evaluating the social environment: (a) spatial–physical aspects of proximal external spaces of the hospital (16 items); (b) spatial–physical aspects of the care unit and specific in-/out-patient (waiting) area (36 items), and (c) social–functional aspects of the care unit (18 items). Items are defined as sentences that express environmental evaluations (e.g., “*External hospital area is not very clean*”), and responses were made on 5-point *Likert*-type scales (from 0 “*totally disagree*” to 4 “*totally agree*”). Each scale contains positive (i.e., indicating the presence of quality) and negative (i.e., indicating the absence of quality) items, in order to control for response set. Scales were translated from Italian to Portuguese, using the translation and back-translation method, and pre-tested for testing clarity of instructions and item wording. For this purpose, 14 participants (6 patients, 4 visitors, and 4 nurses of one of the hospitals where the study was conducted) were asked to qualitatively appraise the instructions and items of the pre-final version of the instrument. As a result, one item from the Social-functional features’ scale was divided in two items, namely, “*Staff members are generally not very understanding toward patients*” was divided in “*Nurses are generally not very understanding toward patients*” and “*Operational assistants are generally not very understanding toward patients*”. The first section also included, after each PHEQIs scale, three 10-point items to measure environmental global evaluation, e.g., “*In general, how do you evaluate the environment quality of the hospital external space?*”. These three questions (global evaluations of external space, care unit and in-/out-patient area, and social-functional environment) were developed in order to test the criterion concurrent validity of PHEQIs scales.

The questionnaire also included questions to measure satisfaction with the care unit, well-being, familiarity with the hospital and with hospitals in general, and socio-demographics.

Experts' observation grid³

The four orthopedic units were technically evaluated with respect to various design attributes that cover the same issues as the PHEQIs scales concerning spatial-physical aspects, through an observation grid (adapted from Fornara et al., 2006), except as regards the quietness dimension (see Appendix D). Items were rated from 0 to 4 with the categories of *inadequate*, *minimal*, *satisfactory*, *good*, and *excellent*.

The observation was done by two independent judges with a theoretical background in architectural design issues, in order to test the criterion predictive validity of PHEQIs. Interjudge agreement was moderate ($r(276)=.66$, $p<.05$). A different approach to view this level of agreement is to count the number of items to which the two architects gave the same rating ($n=142$, 51.3%), in which the ratings were off by one ($n=117$, 42.2%), and in which the ratings were off by more than one ($n=18$, 6.5%).

Procedure

Permission for the study was obtained from the orthopedic care units' directors and the data were collected between October and December 2009. Participants were contacted by a trained researcher in the in-patient or out-patient (waiting) area of each orthopedic care unit, and were informed of the nature and purpose of the study. Confidentiality was assured. Persons who agreed to participate in the study filled out the questionnaire with reference to the hospital area where they were at the moment. When patients did not have the physical capability to read or to answer the questionnaire alone, data were collected through an interview.

Data analysis

First, in order to confirm the differences between the two older and the two newer hospitals regarding the "objective" evaluation, a mean between the two architects' evaluations of each hospital was computed.

³ More information about the experts' observation grid can be requested from the corresponding author.

Then, running the AMOS 17 software (SPSS Inc, Chicago, IL), Confirmatory Factor Analyses were performed to validate each PHEQIs scale, allowing the factors to be correlated. The model was first developed on the total sample, and then confirmed on a randomly selected half part of it (test sample, $n=281$). To evaluate the global adjustment quality of the model we considered *CFI* and *GFI* above .90, *PCFI* and *PGFI* above .60, χ^2/df around 2, and *RMSEA* below .05 with non-significant p as indicating the good adjustment of the model (e.g., Schumacker & Lomax, 1996).

For each scale, a step-by-step iterative procedure was followed (similar to the one used by Fornara et al., 2010 for creating the abbreviated form of the Perceived Residential Environment Quality Indicators - PREQIs), starting from the analysis of the initial solution including all the items. Both conceptual and statistical criteria led to the emergent factorial solutions. The model refinement was made taking into account the significance and the magnitude of items' factorial loadings (values equal or above .50 were considered acceptable), and through the modification indices by Lagrange Multipliers (LM) (the paths and correlations with $LM > 11$ ($p < .001$) were considered indicators of significant variation on the model quality). Every time two items shared a high proportion of measure error, one of them was eliminated. Conceptually, we tried to keep the same factorial structure. At the same time, if possible, items measuring an identical aspect were avoided, for example, one positively and one negatively worded.

Construct reliability was evaluated by the calculation of the composite reliability (Fornell & Laker, 1981) and of the inter-item correlations. Construct validity was evaluated through factorial validity, convergent validity (estimated by average variance extracted – AVE, Hair, Anderson, Tatham, & Black, 1998; and by the statistical significance at $p < .001$ of the observable variables' loadings on the respective latent factor), and discriminant validity (evident when the factors have greater AVE than the variance they share with the other factors, expressed by their respectively squared correlations, see Fornell & Laker, 1981). We considered values equal or above .70 as acceptable for composite reliability; and values equal or above .50 for AVE (which indicates that the factors explain more than 50 percent of the variance in its items).

As there are no other measures of hospital EQP to compare with PHEQIs, concurrent criterion validity was analyzed through the correlations between each scale and the users' global evaluation of that attribute of the environment. Predictive criterion validity was examined using a one-way ANOVA (post-hoc comparisons were run using the *Scheffé's Test*) to assess the significance of differences between EQP means among

the users of different hospitals. In addition, correlations between experts' and users' evaluations of the environment were also tested. To proceed with this analysis, each hospital was considered as a case, and the means of the users' and of the two experts' evaluations were correlated through Spearman's Rho correlations.

Items' sensibility was evaluated by analyzing the skewness and the kurtosis coefficients. We considered skewness values above 3, and kurtosis values above 10 (in absolute value) to have sensibility problems and significant deviation from normality (e.g., Kline, 1998).

4. Results

Experts' evaluation

The experts' objective evaluations regarding the hospitals' external space area, care unit's out-patient area, and care unit's in-patient area are higher for the two newer hospitals than for the two older hospitals (Fig.2.13). This pattern is more pronounced for the in-patient than for the out-patient areas.

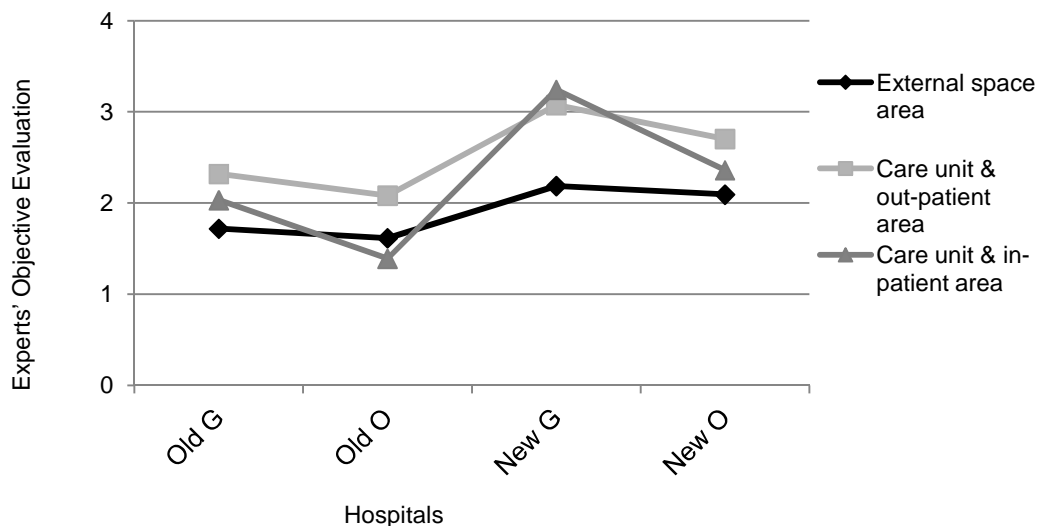


Figure 2.13 Mean scores of architects' evaluation of the hospital areas design quality (n=2).

Note: Old G - old and general hospital; Old O - old and orthopedic hospital; New G - new and general hospital; New O - new and orthopedic hospital

Validation of PHEQIs scales

The skewness and kurtosis estimates for PHEQIs items are all acceptable, indicating that responses are normally distributed.

Scale 1: External spaces

Confirmatory Factor Analysis of the four-factor structure of this scale indicated that the original model has a poor adjustment to the study sample (Table 2.2).

Table 2.2 Goodness-of-fit indices for original and modified models

	Adjustment indices					Parsimony indices		
	χ^2/df	CFI	GFI	RMSEA	p (rmsea $\leq .05$)	AIC	BCC	MECV <i>I</i>
Scale 1								
Original model (total sample)	5.474	.791	.887	.089	.000	612.409	614.784	1.096
Modified model (total sample)	4.697	.870	.935	.081	.000	285.433	286.856	.511
Modified model (test sample)	2.953	.870	.922	.084	.000	201.751	204.672	.731
Scale 2								
Original model (total sample)	4.839	.698	.733	.083	.000	3001.203	3012.218	5.369
Modified model (total sample)	3.708	.915	.926	.069	.000	383.483	385.597	.687
Modified model (test sample)	2.439	.915	.911	.072	.003	276.861	281.224	1.004
Scale 3								
Original model (total sample)	5.562	.775	.867	.090	.000	726.316	728.636	1.299
Modified model (total sample)	4.587	.922	.954	.080	.000	157.257	157.947	.282
Modified model (test sample)	2.181	.950	.955	.065	.134	94.697	96.104	.343

To achieve a better fit, 4 items were removed. The modified model has a better adjustment to the sample data than does the original model, even if that adjustment cannot be considered very good, because CFI, *RMSEA* and χ^2/df values are still slightly distant from the recommended values. The correlations between the different environmental dimensions range from very low (between the factors “orientation” and “green spaces”, $r=.10$, n.s.) to very high (between “upkeep & care” and “orientation”, $r=.75$, $p<.001$). Although this strong correlation between “upkeep & care” and “orientation” factors suggests that these dimensions are highly related, the analysis supported a modified model keeping these factors separated. The four-factor modified model was compared with a three-factor model combining “upkeep & care” and “orientation” factors ($\chi^2/df=5.106$, $CFI=.846$, $GFI=.927$, $RMSEA=.086$; $p(\text{rmsea}\leq.05)<.001$). The Chi-Square difference test indicated that the four-factor model has significantly better fit than does the three-factor model ($\Delta\chi^2_{(3)}=34.92$, $p<.001$). Moreover, the content of factors also supports treating them as separate constructs, since they reflect different conceptual dimensions. Because the interest is to keep the original structure, and the four-factor model has better adjustment quality, we decided to retain the four-factor model.

The modified model is more parsimonious than the original model and has an acceptable global adjustment even in the test sample. Considering the overall results and, in particular, the improvement of the global adjustment of the model, the reliability and validity of the modified model composed by 12 items were analyzed. Subscales scores were calculated by taking the mean of the contributing items. Composite reliability is above the optimum level of .70 for the composite reliability for “building aesthetics” factor (.74) and slightly below .70 for “upkeep & care” (.64), “orientation” (.65) and “green spaces” factors (.65). In addition, the mean of inter-item correlations is acceptable ($M_C=.36$; $M_O=.32$; $M_{GS}=.39$; $M_{BA}=.48$; $M_{\text{total}}=.19$). In general, these values are appropriate and indicate construct reliability.

All factor loadings connecting the items with the latent variables are significant and above .50, providing evidence of convergent validity. However, AVE for “building aesthetics”, “upkeep & care”, “orientation”, and “green spaces” factors are .48, .37, .33 and .38, respectively, giving the opposite evidence. Regarding discriminant validity, factors’ AVE exceed the variance shared between them, except “upkeep & care” and “orientation”, with a correlation of 0.75 ($r^2=.75^2=.56$).

Positive and significant correlations between users' global evaluation of the external space and the total scale show evidence for concurrent criterion validity ($r=.60$, $p<.01$). Looking at the separate factors, "upkeep & care" had the strongest correlation ($r=.54$, $p<.01$), followed by "building aesthetics" ($r=.41$, $p<.01$) and "orientation" ($r=.36$, $p<.01$). The smallest correlation was with "green spaces" ($r=.26$, $p<.01$).

Finally, predictive criterion validity has been shown because a series of ANOVAs revealed that the scale of External spaces, as well as its subscales, significantly differentiate between users of the four hospitals ($F_{External\ space\ total\ scale}(3,558)= 18,652$, $p<.001$, $\eta^2=.09$; $F_{upkeep\ \&\ care}(3,558)= 49,892$, $p<.001$, $\eta^2=.21$; $F_{orientation}(3,558)= 29,459$, $p<.001$, $\eta^2=.14$; $F_{green\ spaces}(3,558)= 9,967$, $p<.001$, $\eta^2=.05$; $F_{building\ aesthetics}(3,558)= 40,657$, $p<.001$, $\eta^2=.18$) (Table 2.3).

Table 2.3 External space scale: means, standard deviations and post-hoc comparisons (Scheffé Test, $\alpha=.05$)

	Old G Hospital ($n=173$)	Old O Hospital ($n=144$)	New G Hospital ($n=107$)	New O Hospital ($n=138$)	Total
<i>Upkeep & Care</i>	2.17 ^a (0.89)	1.97 ^a (0.82)	3.17 ^c (0.81)	2.71 ^b (0.90)	2.44 (0.97)
<i>Orientation</i>	1.76 ^a (0.87)	1.98 ^a (0.82)	2.70 ^b (0.92)	2.41 ^b (1.02)	2.15 (0.97)
<i>Green Spaces</i>	1.77 ^c (1.15)	1.66 ^{bc} (0.95)	1.37 ^{ab} (1.00)	1.18 ^a (0.98)	1.52 (1.57)
<i>Building Aesthetics</i>	2.05 ^a (0.99)	1.92 ^a (0.98)	1.93 ^a (1.12)	3.01 ^b (0.76)	2.23 (1.07)
Total scale	1.94 ^a (0.67)	1.89 ^a (0.58)	2.30 ^b (0.69)	2.33 ^b (0.59)	2.09 (0.66)

Note. Means in the same row that have different subscripts differ significantly ($p<.05$).

A Scheffé's Test was conducted to determine which specific groups were different regarding the total scale. As expected, the users of the two newer hospitals reported higher scores of external space EQP ($M_{NG}=2.30$; $M_{NO}=2.33$) than did the users of the two older hospitals ($M_{OG}=1.94$; $M_{OO}=1.89$).

Correlations between experts' and users' evaluations regarding the external space ($r=.80$, n.s.) and, in particular, to "upkeep & care" ($r=.80$, n.s.), "orientation" ($r=.80$, n.s.), "green spaces" ($r=.63$, n.s.) and "building aesthetics" ($r=.80$, n.s.) factors are all positive and high, giving further evidence to predictive criterion validity.

Scale 2: Care unit & In-/Out-patient (waiting) area

Confirmatory factor analysis of the four-factor structure of this scale indicated that the original model has a poor adjustment to the study sample (Table 2.1). To achieve a better fit, 21 items were removed. We should stress that with the elimination of these items the “quietness” factor kept only 2 of its original 4 items, both regarding the noise that users hear from the outside, one positively and one negatively worded. However, in the whole “quietness” factor, only these two items had acceptable factor loadings. The correlations between the factors range from .37 ($p<.001$), between “spatial-physical comfort” and “quietness”, and .55 ($p<.001$), between “spatial-physical comfort” and “views & lighting”, which are appropriate values. The modified model has a better adjustment to the sample data and is more parsimonious than is the original model. In addition, the modified model also has an acceptable global adjustment in the test sample. Considering the results and, in particular, the improvement of the global adjustment of the model, the reliability and validity of the modified model composed by 15 items were analyzed.

The composite reliability of this scale is above .70 for “spatial-physical comfort” (.84) and “orientation” (.77) factors, and below .70 for “views & lighting” (.68) and “quietness” (.66) factors. Further, the mean of inter-item correlations is acceptable ($M_{SPC}=.45$; $M_O=.35$; $M_Q=.39$; $M_{VL}=.51$; $M_{total}=.28$). In general, these values are appropriate and indicate construct reliability.

All factor loadings connecting the items with the latent variables are significant and above .50, indicating convergent validity. However, AVE values are respectively .47, .46, .40 and .52 for “spatial-physical comfort”, “orientation”, “views & lighting” and “quietness” factors. Thus, except for “quietness”, these values are slightly distant from the recommended value. Regarding discriminant validity, in all cases factors’ AVE are higher than the variance shared between them.

Concurrent criterion validity and predictive criterion validity were tested using in-patient ($n=310$) and out-patient ($n=252$) samples separately.

Regarding care unit and in-patient area, positive and significant correlations between the total scale and users’ global evaluation ($r=.66$, $p<.01$) show evidence for concurrent criterion validity. Looking at the separate factors, “spatial-physical comfort” had the strongest correlation ($r=.60$, $p<.01$), followed by “orientation” ($r=.51$, $p<.01$). The smallest correlations were with “views & lighting” ($r=.35$, $p<.01$) and “quietness” ($r=.28$, $p<.01$).

Regarding care unit and out-patient area, we also found evidence for concurrent criterion validity, since correlation between the total scale and users' global evaluation ($r=.62, p<.01$) is positive and significant. With respect to the separate factors, "spatial-physical comfort" had the strongest correlation ($r=.60, p<.01$), followed by "orientation" ($r=.51, p<.01$). The smallest correlations were with "views & lighting" ($r=.37, p<.01$) and "quietness" ($r=.15, p<.01$). All correlations between subscales and global evaluation are positive and significant.

Finally, a series of ANOVAs showed that the total scale and its subscales differentiate between users of the 4 hospitals, both for users in in-patient area ($F_{Care Unit \& In-patient area' scale}(3,306)= 23,716, p<.001, \eta^2=.19$; $F_{spatial-physical comfort}(3,306)= 37,715, p<.001, \eta^2=.27$; $F_{orientation}(3,306)= 8,518, p<.001, \eta^2=.08$; $F_{quietness}(3,306)= 13,263, p<.001, \eta^2=.12$; $F_{views \& lighting}(3,306)= 10,135, p<.001, \eta^2=.09$) (Table 2.4), and in out-patient area ($F_{Care Unit \& Out-patient area' scale}(3,251)= 35,165, p<.001, \eta^2=.30$; $F_{spatial-physical comfort}(3,251)= 40,805, p<.001, \eta^2=.33$; $F_{orientation}(3,251)= 4,469, p<.01, \eta^2=.05$; $F_{quietness}(3,251)= 5,276, p<.01, \eta^2=.06$; $F_{views \& lighting}(3,251)= 30,375, p<.001, \eta^2=.27$) (Table 2.5).

*Table 2.4*In-patient area scale: means, standard deviations and post-hoc comparisons (Scheffé Test, $\alpha=.05$)

	Old G Hospital ($n=98$)	Old O Hospital ($n=80$)	New G Hospital ($n=63$)	New O Hospital ($n=69$)	Total ($n=310$)
<i>Spatial-Physical</i>					
<i>Comfort</i>	2.40 ^b (0.88)	1.67 ^a (0.92)	3.12 ^c (0.69)	2.69 ^b (0.85)	2.42 (0.99)
<i>Orientation</i>	2.50 ^{ab} (0.98)	2.10 ^a (0.95)	2.84 ^b (0.89)	2.74 ^b (1.02)	2.52 (1.00)
<i>Quietness</i>	2.20 ^a (1.43)	2.82 ^b (1.10)	3.40 ^c (0.89)	2.82 ^b (1.19)	2.74 (1.26)
<i>Views & Lighting</i>	2.45 ^a (0.96)	2.80 ^{ab} (1.09)	2.97 ^{bc} (0.86)	3.28 ^c (0.99)	2.83 (1.03)
Total scale	2.41 ^a (0.74)	2.16 ^a (0.68)	3.05 ^b (0.58)	2.84 ^b (0.78)	2.57 (0.78)

Note. Means in the same row that have different subscripts differ significantly ($p<.05$).

Table 2.5 Out-patient area scale: means, standard deviations and post-hoc comparisons (Scheffé Test, $\alpha=.05$)

	Old G Hospital (<i>n</i> =75)	Old O Hospital (<i>n</i> =64)	New G Hospital (<i>n</i> =44)	New O Hospital (<i>n</i> =69)	Total (<i>n</i> =252)
<i>Spatial-Physical</i>					
<i>Comfort</i>	1.67 ^a (0.81)	1.56 ^a (0.86)	3.06 ^c (0.67)	2.45 ^b (0.86)	2.10 (0.99)
<i>Orientation</i>	2.49 ^{ab} (0.83)	2.25 ^a (0.94)	2.84 ^b (1.05)	2.70 ^{ab} (0.93)	2.55 (0.95)
<i>Quietness</i>	2.67 ^a (0.99)	2.87 ^a (0.95)	3.41 ^b (0.85)	2.97 ^{ab} (1.10)	2.94 (1.02)
<i>Views & Lighting</i>	1.84 ^a (1.00)	1.62 ^a (1.01)	2.57 ^b (1.02)	3.05 ^b (0.87)	2.24 (1.13)
Total scale	2.05 ^a (0.59)	1.93 ^a (0.61)	2.95 ^b (0.70)	2.71 ^b (0.66)	2.36 (0.75)

Note. Means in the same row that have different subscripts differ significantly ($p<.05$).

A Scheffé’s Test was conducted to determine which specific groups were different regarding the total scale. As expected, the users of the two newer hospitals reported significantly higher scores of EQP of the care unit and in-patient area ($M_{NG}=3.05$; $M_{NO}=2.84$) than did the users of the two older hospitals ($M_{OG}=2.41$; $M_{OO}=2.16$). The same significant difference appeared as regards EQP of the care unit and out-patient areas (i.e., $M_{NG}=2.95$ and $M_{NO}=2.71$ vs. $M_{OG}=2.05$ and $M_{OO}=1.93$). These results show evidence for predictive criterion validity.

In addition, the correlation between experts’ and users’ evaluations of the in-patient area quality ($r=1.00$, $p<.01$) and, in particular, of “spatial-physical comfort” ($r=.80$, n.s.), “orientation” ($r=1.00$, $p<.01$) and “views & lighting” ($r=.60$, n.s.) are all positive and high. The same result emerged regarding the correlation between experts’ and users’ evaluations regarding the out-patient areas ($r=1.00$, $p<.001$) and, in particular, to “spatial-physical comfort” ($r=.80$, n.s.), “orientation” ($r=1.00$, $p<.001$) and “views & lighting” ($r=1.00$, $p<.01$). These results give additional support to predictive criterion validity.

Scale 3: Social-functional features

Confirmatory factor analysis of the two factor structure of this scale indicated that the original model had a poor adjustment to the study sample (Table 2.1). To achieve a better fit, 8 items were removed. The correlation between “Care for social and organizational relationship” and for “privacy” factors is moderate-high in the modified

model ($r=.63$, $p<.001$) but less than it was in the original model ($r=.71$, $p<.001$). Overall, the modified model has a better adjustment to the sample data and is more parsimonious than was the original model. Additionally, the modified model also has a good global adjustment in the test sample. Considering the results and, in particular, the improvement of the global adjustment of the model, the reliability and validity of the modified model composed by 9 items were analyzed.

The composite reliability of the scale is above .70 both for “care for social and organizational relationship” (.85) and for “privacy” (.77) factors and also the mean of inter-item correlations is acceptable ($M_{CSOR}=.37$; $M_P=.40$; $r_{total}=.31$). In general, these values are appropriate and indicate construct reliability.

All factor loadings connecting the items with the latent variables are significant and above .50, providing evidence for good convergent validity. Further, AVE is .49 and .53 for the “care for social and organizational relationship” and “privacy” factors, respectively, which gives it additional support.

Regarding discriminant validity, the factors’ AVEs are higher than the variance they share ($r^2=.63^2=.40$), showing evidence for discriminant validity.

Positive and significant correlations between the total scale and users’ global evaluation of the social-functional features ($r=.56$, $p<.01$) show evidence for concurrent criterion validity. Looking at the separate factors, “care for social and organizational relationship” had the strongest correlation ($r=.50$, $p<.01$), followed by privacy ($r=.37$, $p<.01$).

Finally, predictive criterion validity has been shown because a series of ANOVAs demonstrated that both the total scale, and subscales differentiate between the users of the 4 hospitals ($F_{Social-functional\ features'\ scale}(3,558)= 12.702$, $p<.001$, $\eta^2=.06$; $F_{care\ for\ social\ and\ organizational\ relationship}(3, 558)= 15.104$, $p<.001$, $\eta^2=.08$; $F_{privacy}(3,558)= 4.274$, $p<.01$, $\eta^2=.02$) (Table 2.6). A Scheffé’s Test was conducted to determine which specific groups were different regarding the total scale. As expected, the users of the two newer hospitals reported higher scores of EQP of the social-functional features ($M_{NG}=2.93$; $M_{NO}=2.76$) than did the users of the two older hospitals ($M_{OG}=2.39$; $M_{OO}=2.47$).

Table 2.6 Social-functional features scale: means, standard deviations and post-hoc comparisons (Scheffé Test, $\alpha=.05$)

	Old G Hospital (n=173)	Old O Hospital (n=144)	New G Hospital (n=107)	New O Hospital (n=138)	Total (n=562)
<i>Privacy</i>	2.45 ^{ab} (1.05)	2.23 ^a (1.10)	2.66 ^b (0.99)	2.27 ^a (1.07)	2.39 (1.07)
<i>Care for Social and Organizational Relationship</i>	2.44 ^a (0.85)	2.56 ^a (0.89)	2.99 ^b (0.78)	2.95 ^b (0.82)	2.70 (0.87)
<i>Total scale</i>	2.39 ^a (0.79)	2.47 ^a (0.88)	2.93 ^b (0.76)	2.76 ^b (0.81)	2.60 (0.84)

Note. Means in the same row that have different subscripts differ significantly ($p<.05$).

These results also show evidence for the congruence between the physical and social environment evaluation. However, comparing these means with the means of the scales regarding the physical attributes of the environment, the differences between hospital users are not remarkable.

For all the scales, the re-specification of the original model led to the elimination of a high number of items. From the initial 67 items included in PHEQIs scales, the modified scales retained only 36, representing a 46% reduction in the number of items. Thus, this reduction process simultaneously served the objective of reducing the scales, as was one of our objectives.

5. Discussion

Anyone thinking about being in a hospital, as an employee, patient, or visitor, can list without difficulty some of the characteristics of the environment associated with good quality. Those characteristics would not be the same (or have the same importance) for everyone because they would vary depending on the role, the needs, the interests, the expectations, the physical condition, the gender, or the age of the person, etc. However, across users, the relevance of some environmental dimensions is shared, such as comfort, natural light, and privacy (e.g., Evans & McCoy, 1998). For that reason, these characteristics might be included on all users' checklist of hospital environmental quality evaluation.

Hospitals are changing toward providing a more user-centered service to reflect the needs and expectations of users. Architects, designers, and planners can take advantage of a measure that gives users' feedback about the quality of the hospital environment. Further, hospital administrators may be interested in monitoring users' appraisals of a healthcare component (the physical environment) that has a significant influence on patients' overall satisfaction and well-being. Researchers are being called to increase the knowledge about the impact of healthcare physical environment attributes on users' outcomes, and to understand the role of appraisals of the physical environment on users' hospital experience. For these reasons, systematic empirical research of the components of hospital environmental quality perception (EQP) is needed and, as such, requires a validated measure.

The main goal of this paper was to present the adaptation and validation of a hospital EQP measure developed in Italy (PHEQIs; Fornara et al., 2006), and to test the structure of the multidimensional construct of hospital EQP. To do so, a Portuguese sample of users from four different hospitals was used. The items of the three PHEQIs scales were submitted to a confirmatory factorial analysis and the adequacy of the measurement models was tested.

The analysis produced the replication of the scales' factorial structures and final measurement models had good, or at least acceptable, fit indices, both in total as in test samples. Further, though some composite reliability values are lower than .70, internal consistency proved to be acceptable for all the scales, considering that the final versions of the scales include many fewer items. For the External-space scale, composite reliability ranged from .64 to .74; for the Care unit & In-/Out-patient area scale, the values ranged from .66 to .84; and for the Social-functional features scale, the values ranged from .77 to .85.

Once item validity and reliability have been assessed, the next step was to evaluate construct-level validity. Results supported discriminant validity; for all scales it was shown that the variance extracted for each factor was greater than the variance shared between them. The only exception was due to the strong correlation between "upkeep & care" and "orientation" factors of the External space scale ($r=.75, p<.001$). It is plausible that this correlation might be related to a bi-directional influence between these two dimensions. For instance, users may tend to converge in their evaluations related to upkeep and care and orientation, as if a well-maintained environment would

facilitate way-finding or an environment that allows easy orientation was perceived as better maintained. This result needs confirmation with other samples.

On the other hand, some difficulty in showing convergent validity was found. For a construct to possess convergent validity, the majority of the variance in its items (i.e., more than 50%) should be accounted for by the underlying construct rather than by measurement error (Fornell & Larcker, 1981), and this was assessed by the average variance extracted. Low AVE was found for some factors, namely the “upkeep & care”, “orientation”, and “green spaces” factors of the External-space scale; and for the “spatial-physical comfort”, “orientation”, and “views & lighting” factors of the Care unit & In-/Out-patient area scale. We attribute these results mainly to some of the characteristics of the items defined to tap each of the dimensions. First, an uneven number of positively and negatively worded very similar items along the scales might have confused the respondent. In addition, the formulation of some of the negatively worded items can make them difficult to answer using a *Likert*-type scale from “totally disagree” (0) to “totally agree” (4). This is the case of items such as “*External hospital area is not very clean*” from the factor “upkeep & care” of the External-space scale, and “*The view from the windows has little interest*” from the factor “views & lighting” of the scale Care unit & In-/Out-patient area. Mistakenly, some people might tend to rate 0 instead of 4 when they agreed with the sentences, or the opposite. Negatively worded items are employed primarily to attenuate response pattern bias, however some studies have found they can reduce the validity of item responses (Hinkin, 1995). Examining the factor loadings of individual items, it had not been found that negatively worded items had lower loading than positively ones. In any case, the formulation of these items should be revised in order to make them clearer. For instance, the formulation “External hospital area is unclean” and “From the windows the view is uninteresting” should solve this question.

Second, some dimension’s domain might not be fully represented by its items. This is obviously the case of the factor “quietness” that, although has a good AVE value (.52), its composite reliability is slightly lower than .70 (.68). This dimension has only two items, both addressing the noise that come from the outside (one positively and other negatively worded), which means that the dimension does not capture users’ perceptions of the noise inside the care unit, which is much more common.

A third issue that might explain the low convergent validity is that some of the items can have double meanings. Even if part of them were deleted during the model’s

re-specification process, others are still integrated in the final scales. For instance, the “green spaces” scale includes the item *“In the external hospital area there is a lack of well-kept green spaces”*. This item mixes the ideas of the external hospital area having or not enough green spaces, and the idea of those green spaces being well-kept or not. In general, double-barreled items should be split into two single idea statements; items should be simple, clear, and as straightforward as possible (see DeCoster, 2000). Therefore, these issues need to be reexamined in future studies in order to ensure respondents will similarly interpret the items, and that they properly will capture the conceptual domain of each dimension. These refinements possibly will improve construct convergent validity.

An important step in validating PHEQIs was to correlate it with a measure of the same construct (alternatively, the global evaluation of the environment was used) and to compare it with a valid criterion (as the objective evaluation of the environment). All scales and its factors correlated with the global evaluation of the environment, providing evidence for concurrent criterion validity of PHEQIs. Also as predicted, the construct predictive validity was supported by the finding that users in newer hospitals have higher scores on the EQP scales than do users in older hospitals, which indicates that PHEQIs scales are sensitive to detect different spatial and physical conditions. Moreover, high congruence between users’ and experts’ evaluations was verified. It should be noted that, despite the fact that all the results of these correlations are in the expected direction, the limited number of hospitals lowers the power of the test, and in some cases the correlations were not statistically significant. On the whole, these results suggest that “objectively” good hospital environments improve users’ EQP as measured by PHEQIs.

Throughout the refinement procedure of each scale we were forced to eliminate a very large number of items. Consequently, this procedure also served the objective of reducing the number of items in the scales. This was particularly clear regarding the “spatial-physical comfort” dimension of the Care unit & In-/Out-patient area scale. This factor originally included 19 items, which related to a very broad array of aspects (e.g., furniture; walls, floors, ceilings; colors; cleanliness; temperature; humidity; air; seats; and windows). The modified model kept only 6 of those items, regarding furniture; walls, floors, ceilings, and seats. This result suggests that this conceptual domain of the construct was being measured with many items and that some of them eventually should be measuring distinct characteristics of EQP. As a consequence, the conceptual

dimensionality of care unit and in-/out-patient area EQP might need some further investigation, particularly the content validity of “spatial-physical comfort”. In any case, specifying latent variables with a large number of indicators poses numerous problems and certainly results in misleading fit index values (Little, Cunningham, Shahar, & Widaman, 2002), which happened in our analysis.

This study was a second step toward the development of a culture-general hospital EQP measure. PHEQIs have been used in different types of Italian care units, and in this study evidence has been found supporting the reliability and the validity of the PHEQIs scales in a different cultural context. Confirmatory factor analysis is considered to be a more advanced method than exploratory factor analysis to address the factor structure in instrument development (Bagozzi, Yi, & Phillips, 1991). Nevertheless, results confirmed the factor structure of the PHEQIs scales, indicating that hospital EQP can be measured through ten environmental dimensions related to external spaces, in-/out-patient area, and social-functional features. Additionally, it seems that these shorter and easier-to-use versions of the scales are still able to capture the core dimensions of the hospital quality environment. As previously mentioned, some items still need adjustments and the factorial structure of the EQP of the Care unit & In-/Out-patient area scale might need further validation in other samples. However, taking the overall results into account, the PHEQIs have the potential to become a widely used and valued measure in the field.

We have argued that PHEQIs may be useful for healthcare designers, administrators, and researchers. From a research perspective, several directions and research questions can be identified and tested with PHEQIs. For example, when the objective quality of the hospital environment varies, does the perception of the quality of the physical environment (external spaces, and in-/out-patient area) and the perception of the quality of the social-functional environment vary to the same degree? Which aspects of the physical and social environment may lead to better well-being and satisfaction among users? Which objective attributes of the environment are more likely to produce an increase in EQP? Equally interestingly would be to investigate the differences among patients, staff, and visitors. Some studies have found that staff tends to make more negative evaluations of the hospital physical environment than do patients and visitors (Devlin, 1995, 2010), which would be interesting to understand. In fact, it is important to note that PHEQIs scales, particularly the Care unit & In-/Out-patient area, and the Social-functional features scales, ask the respondents to assess the environment

that is designed for patients (e.g., waiting area), or to assess the environment from the point of view of the patients (e.g., “*In this care unit doctors are generally not very understanding toward patients*”). Staff would possess sufficient knowledge to assess the environmental quality of the waiting area of the care unit where they work, or to give their impression of the quality of care they deliver. In fact, Mroczek, Mikitarian, Vieira, and Rotarius (2005) found that 70% ($n=722$) of the staff of a medical center believed that home-like patient rooms have a positive impact (somewhat positive, positive, or very positive) on the quality of their work life. The authors explain that the home-like appearance of the patient rooms may comfort patients and family and also make them more comfortable, which in turn may make nurses’ job easier. In spite of this, it should be kept in mind that through PHEQIs what one can obtain is a subjective evaluation of users about the “patient-centeredness” of the hospital environment. For example, in the current version of PHEQIs staff members do not directly assess their own physical and social work environment (e.g., nursing station, restroom). Future research should investigate the convenience of developing an additional PHEQIs scale where health professionals can evaluate their own environment. PHEQIs are not only useful in field studies, but have been also applied in experimental studies (Andrade, Lima, Devlin, & Hernández, under review). To our knowledge, PHEQIs are also being used to inform hospital administrators and healthcare designers. For example, the research group CIRPA (Center of Interuniversity Research on Environmental Psychology) used this set of instruments when involved in the design of the Concourse for the New Pediatric Hospital Meyer of Florence, which is a leading structure at the national level (see Bonnes, Fornara, & Bonaiuto, 2008) as well as in a specific collaboration with the group of designers from the TESIS center of the University of Florence (Del Nord, 2006). In Portugal PHEQIs have been used in academic work intended to give information to hospital administrators about users’ perceptions of the hospital environment and the relation of those perceptions with other relevant outcomes, and also in a pre-post study related to the move of a hospital to a new building. It is expected that these and other studies will bring interesting results and influence better healthcare designs. Despite the positive results of this study, PHEQIs must be applied and validated in more cultural contexts in order to further confirm its reliability. Hopefully these scales can provide an opportunity to invigorate interest in the investigation, evaluation, and improvement of health care environments.

6. References

- Amerigo, M., & Aragonés, J. M. (1997). A theoretical approach to the study of residential satisfaction. *Journal of Environmental Psychology, 17*, 47-57.
- Applebaum, A., Fowler, S., Fiedler, N., Osinubi, O., & Robson, M. (2010). The impact of environmental factors on nursing stress, job satisfaction and turnover intention. *Journal of Nursing Administration, 40*(7/8), 323-328.
- Arneill, A., & Devlin, A. S. (2002). Perceived quality of care: the influence of the waiting room environment. *Journal of Environmental Psychology, 22*, 345-360.
- Arneill, B., & Frasca-Beaulieu, F. (2003). Healing Environments: Architecture and Design Conducive to Health. In S. B. Frampton, L. Gilpin & P. A. Charmel (Eds.), *Putting Patients First: Designing and Practicing Patient-Centred Care*. San Francisco, CA: Jossey-Bass.
- Bagozzi, R. P., Yi, Y., & Phillips, L. W. (1991). Assessing construct validity in organizational research. *Administrative Science Quarterly, 36*(3), 421-459.
- Baker, A., Davis, R., & Silvadon, P. (1960). *Psychiatric services and architecture*. Geneva (Switzerland): World Health Organization.
- Becker, F. & Poe, D. (1980). The effect of user-generated design modification in a general hospital. *Journal of Nonverbal Behavior, 4*, 195-218.
- Becker, F., Sweeney, B., & Parsons, K. (2008) Ambulatory facility design and patients' perceptions of healthcare quality. *Health Environments Research and Design Journal, 1*(4), 35-54.
- Bonaiuto, M., Aiello, A., Perugini, M., Bonnes, M., & Ercolani, A. P. (1999). Multidimensional perception of residential environment quality and neighbourhood attachment in the urban environment. *Journal of Environmental Psychology, 19*, 331-352.

- Bonaiuto, M., Fornara, F., & Bonnes, M. (2003). Indexes of perceived residential environment quality and neighbourhood attachment in urban environments: A confirmation study on the city of Rome. *Landscape and Urban Planning*, *65*, 41-52.
- Bonaiuto, M., Fornara, F., & Bonnes, M. (2006). Perceived residential environment quality in middle- and low-extension Italian cities. *Revue Européenne de Psychologie Appliquée*, *56*, 23-34.
- Bonnes, M., & Bonaiuto, M. (2002). Environmental psychology: from spatial-physical environment to sustainable development. In R. B. Bechtel, & A. Churchman (Eds.), *Handbook of environmental psychology* (pp. 28-54). New York: John Wiley & Sons.
- Bonnes, M., Bonaiuto, M., Aiello, A., Perugini, M., & Ercolani, A. P. (1997). A transactional perspective on residential satisfaction. In: C. Despres, & D. Piché (Eds.), *Housing surveys. Advances in theory and methods* (pp. 99-135). Quebec, Canada: Crad Université Laval.
- Bonnes, M., Fornara, F., & Bonaiuto, M. (2008). Psicologia ambientale e architettura per la progettazione dei luoghi di cura. In R. Del Nord & C. Donati (Eds.), *L'ospedale del futuro. Modelli per una nuova sanità* (pp. 52-61). Firenze: Il Prato.
- Bonnes, M., & Secchiaroli, G. (1995). *Environmental psychology: A psycho-social introduction*. London: Sage.
- Boudreaux, E., Mandry, C., & Wood, K. (2003). Patient Satisfaction Data as a Quality Indicator: A Tale of Two Emergency Departments. *Academic Emergency Medicine*, *10*(3), 261-268.
- CABE (2004). The Role of Hospital Design in the Recruitment, Retention and Performance of Nurses in England. The Commission of Architecture and the Built Environment, London. Retrieved from <http://www.cabe.org.uk/files/the-role-of-hospital-design-summary.pdf>.
- Canter, D. (1983). The purposive evaluation of places: a facet approach. *Environment and Behavior*, *15*, 659-698.

- Carp, F. M., & Carp, A. (1982). Perceived environmental quality of neighborhoods: development of assessment scales and their relation to age and gender. *Journal of Environmental Psychology, 2*, 245–312.
- Casparia, S., Erikssonb, K., & Naden, D. (2006). The aesthetic dimension in hospitals - An investigation into strategic plans. *International Journal of Nursing Studies, 43*, 851–859.
- Chaudhury, H., Mahmood, A., & Valente, M. (2009). The effect of environmental design on reducing nursing errors and increasing efficiency in acute care settings. *Environment and Behavior, 41*, 755-786.
- Craik, K. H., & Feimer, N. (1987). Environmental assessment. In D. Stokols, & I. Altman (Eds.), *Handbook of Environmental Psychology, Vol. 2.* (pp. 891–918). New York: John Wiley.
- Craik, K. H., & Zube, F. (1976). *Perceiving environmental quality: Research and application.* New York: Plenum Press.
- DeCoster, J. (2000). *Scale Construction Notes.* Retrieved from <http://www.stat-help.com/notes.html>
- Del Nord, R. (2006). *Lo stress ambientale nel progetto dell'ospedale pediatrico. Indizi tecnici e suggestioni architettoniche.* Milano: Motta Editore.
- Devlin, A. S. (1995). Staff, patients, and visitors: Responses to hospital unit enhancements. In J. L. Nasar, P. Grannis, & K. Hanyu (Eds.), *Proceedings of the 26th annual conference of the Environmental Design Research Association* (pp. 13-117). Oklahoma City, OK: EDRA.
- Devlin, A. S. (2010). *What Americans Build and Why – Psychological Perspectives.* New York: Cambridge University Press.
- Devlin, A. S., & Arneill A. B. (2003). Healthcare environments and patient outcomes. *Environment and Behavior, 35*, 665-694.

- Dijkstra, K., Pieterse, M., & Pruyn, A. (2006). Physical environmental stimuli that turn healthcare facilities into healing environments through psychologically mediated effects: systematic review. *Journal of Advanced Nursing*, *56*(2), 166–181.
- Dilani, A. (2001). Psychosocially Supportive Design – *Scandinavian Healthcare Design. International Academy for Design and Health*, *37*(1), 31-38.
- Douglas, C. H., & Douglas, M. R. (2004). Patient-friendly hospital environments: Exploring the patients' perspective. *Health Expectations*, *7*, 61-73.
- Evans, G., & McCoy, J. (1998). When buildings don't work: the role of architecture in human health. *Journal of Environmental Psychology*, *18*, 85-94.
- Fornara, F. (2004). La valutazione ambientale: Il caso dei luoghi ospedalieri. *La Professione di Psicologo*, *2*, 67-70.
- Fornara, F. (2005). Users' evaluative responses to spatio-physical humanization: The case of hospital environments. In B. Martens, & A. G. Keul (Eds.), *Designing social innovation: Planning, building, evaluating* (pp. 231-240). Gottingen (Germany): Hogrefe & Huber.
- Fornara, F., & Andrade, C. C. (2012). Healthcare environments. In S. Clayton (Ed.), *The Oxford Handbook of Environmental and Conservation Psychology* (pp. 295-315). New York: Oxford University Press.
- Fornara, F., Bonaiuto, M., & Bonnes, M. (2006). Perceived hospital environment quality indicators: A study of orthopaedic units. *Journal of Environmental Psychology*, *26*, 321-334.
- Fornara, F., Bonaiuto, M., & Bonnes, M. (2010). Cross-validation of abbreviated Perceived Residential Environment Quality (PREQ) and Neighbourhood Attachment (NA) Indicators. *Environment & Behavior*, *42*, 171-196.
- Fornara, F., Bonaiuto, M., & Bonnes, M. (in press). Indicatori di Umanizzazione Ospedaliera Percepita: Un'analisi comparativa tra reparti di Chirurgia Generale. *Psicologia della Salute*.

- Fornara, F., & Cerina, V. (2011). *Hospitalization experience and psychological well-being in the elderly: A field study in Sardinia*. Abstracts of the interactive poster presentations at the 25th EHPS (European Health Psychology Society) Conference. *Psychology & Health*, 26 (Supplement 2), p. 125. Hersonissos (Greece), 20-24 September 2011. Retrieved from: <http://dx.doi.org/10.1080/08870446.2011.617185>
- Fornell, C., & Laker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.
- Fottler, M. D., Ford, R. C., Roberts, V., Ford, E. W., & Spears, J. D. (2000). Creating a healing environment: The importance of the service setting in the new consumer-oriented healthcare system/practitioner application. *Journal of Healthcare Management*, 45(2), 91-106.
- Gesler, W., Bell, M., Curtis, S., Hubbard, P., & Francis, S. (2004). Therapy by design: evaluating the UK hospital building program. *Health & Place* 10(2), 117-128.
- Gifford, R., Hine, D., Muller-Clemm, W., Reynolds, D., & Shaw, K. (2000). Decoding modern architecture: A lens model approach for understanding the aesthetic differences of architects and laypersons. *Environment and Behavior*, 32, 163-187.
- Gifford, R., Hine, D. W., Muller-Clemm, W., & Shaw, K. T. (2002). Why architects and laypersons judge buildings differently: Cognitive and physical bases. *Journal of Architectural and Planning Research*, 19, 131-147.
- Gotlieb, J. (2002). Understanding the effects of nurses on the process by which patients develop hospital satisfaction. *Holistic Nursing Practice*, 17(1), 49-60.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis*. New Jersey, USA: Prentice Hall.
- Hamilton, D. K. (2003). The Four Levels of Evidence-Based Practice. *Healthcare Design (November)*, 18-26.

- Hignett, S. & Lu, J. (2008). An investigation of the use of health building notes by UK healthcare building designers. *Applied Ergonomics*, 40, 608-616.
- Hinkin, T. (1995). A review of scale development practices in the study of organizations. *Journal of Management*, 21(5), 967-988.
- Horelli, L. (2006). Environmental human-friendliness as a contextual determinant for quality of life. *Revue Européenne de Psychologie Appliquée*, 56, 15-22.
- Ittelson, W. H. (1960). *Some factors influencing the design and functions of psychiatric facilities*. Progress Report, Brooklin College.
- Ittelson, W. H., Proshansky, H. M., & Rivlin, L. G. (1970). The environmental psychology of the psychiatric ward. In Proshansky, H. M., Ittelson, W. H., Rivlin, L. G. (Eds.). *Environmental Psychology: Man and His Physical Setting* (pp 419-439). New York: Holt, Rinehart & Winston.
- Kaplan, S. & Kaplan, R. (2009). Creating a larger role for environmental psychology: The Reasonable Person Model as an integrative Framework. *Journal of Environmental Psychology*, 29(3), 329-339.
- Kline, R. B. (1998). *Principles and practices of Structural equation modelling*. New York : The Guilford Press.
- Leather, P., Beale, D., Santos, A., Watts, J., & Lee, L. (2003). Outcomes of environmental appraisal of different hospital waiting areas. *Environment and Behavior*, 35, 842-869.
- Lee, M. A. & Yom, Y. (2007). A comparative study of patients' and nurses' perceptions of the quality of nursing services, satisfaction and intent to revisit the hospital: A questionnaire survey. *International Journal of Nursing Studies*, 44, 545-555
- Lis, C. G., Rodeghier, M. & Gupta, D. (2011). The relationship between perceived service quality and patient willingness to recommend at a national oncology hospital network. *BMC Health Services Research*, 11:46.

- Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling, 9*, 151-173.
- MacCallum, R. C., & Austin, J. T. (2000). Applications of structural equation modeling in psychological research. *Annual Review of Psychology, 51*, 201-226.
- Martin, D. P., Diehr, P., Conrad, D. A., Davis, J. H., Leickly, R., & Perrin, E. B (1998). Randomized trial of a patient-centered hospital unit. *Patient Education and Counseling, 34*, 125-133.
- Moos, R. H., & Lemke, S. (1984). *Multiphasic environmental assessment procedure: Manual*. Palo Alto, CA: Social Ecology Laboratory, Veterans Administration and Stanford University Medical Center.
- Mroczek, J., Mikitarian, G., Vieira, E. K., & Rotarius, T. (2005). Hospital design and staff perceptions: An exploratory analysis. *Health Care Manager, 24*, 233-244.
- Osmond, H. (1957). Functions as the basis of psychiatric ward design. *Mental Hospital, 8*, 23-30.
- Schellekens, H. M. C. (1979). Experience and environment: perception of environmental quality. *Urban Ecologie, 4*, 151-159.
- Schumacker, R. E., & Lomax, R. G. (1996). *A beginner's guide to structural equation modeling*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Schweitzer, M., Gilpin, L., & Frampton, S. (2004). Healing Spaces: Elements of Environmental Design That Make an Impact on Health. *The Journal of Alternative and Complementary Medicine, 10*(1), 71-83.
- Shepley, M., Harris, D. D., & White, R. (2008). Open-bay and single-family room neonatal intensive care units. *Environment and Behavior, 40*, 249-268.
- Sommer, R. (1969). *Personal space: The behavioral basis of design*. Englewood Cliffs, NJ: Prentice-Hall.

- Sundstrom, E., Bell, P. A., Busby, P. L. & Asmus, C. (1996). Environmental psychology. *Annual Review of Psychology*, 47, 485–512.
- Swan, J. E., Richardson, L. D., & Hutton, J. D. (2003). Do appealing hospital rooms increase patient evaluations of physicians, nurses, and hospital services? *Health Care Management Review*, 28, 254–264.
- Ulrich, R. S., & Gilpin, L. (2003). Healing arts: Nutrition for the soul. In S. B. Frampton, L. Gilpin, & P. A. Charmel (Eds.), *Putting patients first: Designing and practicing patient-centered care*, 117-146. San Francisco: Wiley.
- Ulrich, R. S., Zimring, C. M., Zhu, X., DuBose, J., Seo, H., Choi, Y., Quan, X., & Joseph, A. (2008). A review of the research literature on evidence-based healthcare design. *Health Environments Research and Design*, 1, 61-125.
- Verderber, S., & Fine, D. J. (2000). *Healthcare architecture in an era of radical transformation*. New Haven, CT: Yale University Press.
- Watkins, N., & Keller, A. (2008). Lost in translation: Bridging the Gaps Between Design and Evidence-Based Design. *Health Environments Research & Design Journal*, 1(2), 39-46.
- Zimring, C.M. & Bosch, S. (2008). Building the Evidence Base for Evidence-Based Design: Editors' Introduction. *Environment and Behavior*, 40(2), 147-150.

3

Inpatients' and Outpatients' satisfaction: The mediating role of perceived quality of physical and social environments

This chapter is based on the paper Andrade, C.C., Lima, M.L., Pereira, C., Bonaiuto, M., & Fornara, F. (2013). Inpatients' and Outpatients' satisfaction: The mediating role of perceived quality of physical and social environment. *Health & Place, 21*, 122-132.

1. Abstract

This study analyses the processes through which the physical environment of health care settings impacts on patients' well-being. Specifically, we investigate the mediating role of perceptions of the physical and social environments, and if this process is moderated by patients' status, that is, if the objective physical environment impacts inpatients' and outpatients' satisfaction by different social-psychological processes. Patients (N = 206) evaluated the physical and social environments of the care unit where they were receiving treatment, and its objective physical conditions were independently evaluated by two architects. Results showed that the objective environmental quality affects satisfaction through perceptions of environmental quality, and that patients' status moderates this relationship. For inpatients, it is the perception of quality of the social environment that mediates the relationship between objective environmental quality and satisfaction, whereas for outpatients it is the perception of quality of the physical environment. This moderated mediation is discussed in terms of differences on patients' experiences of health care environments.

Keywords: hospital, inpatients versus outpatients, physical environment, environmental quality perception, satisfaction

2. Introduction

The main goal of health facilities is to promote the users' well-being, and the technical and professional dimensions of those facilities are essential to reach that goal. At the same time there is a growing literature showing that the way hospitals are designed also matters significantly. Imagine you are in a hospital for a consultation. If you wait in a quiet and tidy room, with a view to green spaces, nice paintings on the wall, and comfortable seats, you are likely to feel well, expect good care, and be satisfied with the visit. Alternatively, if the waiting room is noisy and disorganized, with no windows, old posters on the walls and uncomfortable seats, it is likely that you will feel less positive, question the quality of care, and end up less satisfied with the health care service. This association between features of the physical environment and patients' well-being has been found in several studies (see Ulrich et al., 2008, for a review).

Typically those studies show the effect of a specific attribute of the health care physical environment (e.g., view from the window, presence of plants) or the impact of some environmental changes (e.g., renovation) on patients' outcomes (e.g., overall satisfaction, stress) as if these relationships were *per se* self-evident. In fact, literature on health care environments has paid little attention to the mediating processes through which those relationships occur. The research presented in this paper was undertaken to investigate how the health care physical environment is related to well-being. Specifically, we tested if satisfaction with the care unit occurs because the physical environment and social environment are evaluated as having higher quality in hospital areas with more objective environmental quality. In other words, we examined whether the perceptions of patients on the quality of the physical and social environments mediate the relationship between the health care physical conditions and satisfaction with the care unit. In the next sections we will review the literature that focuses on the different associations implicated in this hypothesis.

From features of the physical environment to perceptions of the quality of health care environments

Several studies have demonstrated the impact of the spatial and physical conditions of hospital settings on the perceptions of the quality of the physical environment. Physical environment is defined as ambient, architectural or interior design features that are purely stimulus objects (Dijkstra, Pieterse, & Pruyn, 2006; Harris, McBride, Ross & Curtis, 2002) and that characterize the healthcare settings. Swan, Richardson, and Hutton (2003) found that patients recovering in appealing rooms rated their rooms significantly higher than did patients in typical rooms in the same hospital, and Leather, Beale, Santos, Watts, and Lee (2003) found that a relocated (and redesigned) waiting area originated more positive environmental appraisals, and greater reported environmental satisfaction than the traditional waiting area before relocation. In another study, Becker, Sweeney, and Parsons (2008) compared patients' perceptions of health care quality before and after a dermatology outpatient practice moved from an older building, described as "traditional" in design and décor (and ranked by independent judges as the least attractive setting among six), to a new facility designed to create a highly attractive environment for patients. Patients in the new environment rated the waiting area as being more pleasant, more private, and less crowded than was true for the old environment.

These results show that the improved features of the health care physical environment have consequences on its perceived quality; but that is not the whole picture. These changes also have impact on the perception of the social environment of the care unit. For example, Hagerman and colleagues (2005) found that patients recovering in rooms with good acoustics considered the staff attitude to be much better than did patients treated in rooms with poor acoustics. The study of Swan and colleagues (2003) also found that patients in appealing rooms evaluate physicians more positively than patients in typical rooms in the same hospital.

Using photographs of 28 different waiting rooms, Arneill and Devlin (2002) asked participants to rate how they perceived the quality of care to be delivered in those healthcare settings. Results showed that perceived quality of care was greater for waiting rooms that were nicely furnished, well-lighted, contained artwork, and were warm in appearance, versus waiting rooms that had outdated furnishings, were dark, contained no art-work or poor quality reproductions, and were cold in appearance. The impact of the features of counseling office environments on people' perceptions has also been studied, revealing that, for example, softness/personalization and order are associated with perceptions of how bold, friendly, and qualified the therapist in the

office was likely to be (Nasar & Devlin, 2011), and that the display of credentials is associated with therapists' qualifications and energy (Devlin et al., 2009).

In sum, research shows that the features of the health care settings' physical environment not only influence the appraisal of the physical environment, but also affect the perception of care and staff. This outcome is not surprising since the literature supports the idea that physical traces or cues left by occupants in their work and home environments may be used to form impressions about their traits or characteristics (e.g., Harris & Sachau, 2005; Gosling et al., 2002). In a health care setting, as Arneill and Devlin (2002) pointed out, the physical environment is the first impression that a patient receives. If the environment communicates that the doctors, nurses, and other staff care about its appearance and function themselves and design it with the patient in mind, then the patient enters the system with a positive image of the health care process and trusts that he/she will be well cared for in all other aspects.

These findings may also explain why the perceptions of the physical environment and social environment are often correlated. Fornara, Bonnes, and Bonaiuto (2006) found that in a low humanized hospital (which orthopedic care unit experts evaluated as low quality), inpatients and outpatients perceived lower spatial-physical comfort, as well as lower care for social and organizational relationships than did patients in medium- and high-humanized hospitals. This congruence between the quality of spatial-physical features and social-functional aspects was also found in the studies of Swan et al. (2003), Arneill and Devlin (2002), and Becker et al. (2008), already described in this paper.

From perceptions of the quality of the health care environment to well-being

A different group of studies has shown that both the perception of the quality of the hospital' physical and social environments predict patients' well-being. In other words, the quality of the healthcare setting from the users perspective (Gifford, 2002), and the quality of the social and organizational relationships in general, including the relationship with the staff (Irurita, 1999), are crucial for patients' satisfaction with the hospital experience. Harris, McBride, Ross and Curtis (2002) interviewed 380 discharged inpatients to identify environmental sources of satisfaction with the hospital, and, specifically, to determine the relative contribution of environmental satisfaction to

overall satisfaction with the hospital experience. Environmental satisfaction, that is, satisfaction with interior design, architecture, housekeeping, privacy, and the ambient environment was perceived as a source of overall satisfaction, following nursing and clinical care. In order to explore the views of patients on how their perceived health, mood, and quality of life are affected by the ward physical environment, Rowlands and Noble (2008) interviewed patients with advanced cancer. Despite the fact that patients were informed previously that the purpose of the study was to assist in the redesign of the ward, the strongest theme that emerged was the importance of staff, in particular the nurses. Secondly, three major themes related to the physical environment appeared: the immediate environment, single versus multi-occupancy rooms, and contact with the outside environment. Patients reported that the attitude, competence, and helpfulness of the staff create the atmosphere of the ward regardless of layout, furnishings, equipment and décor, but they also assumed that the physical environment has an effect on their mood and well-being.

Similarly, but using a questionnaire approach, and focusing on primary health care centers, Raposo, Alves, and Duarte (2009) examined the dimensions of health care quality that predict patients' satisfaction. Perception of the quality and empathy of medical care was the stronger predictor of patient satisfaction, followed by the facility's quality.

These studies demonstrate that the evaluations of the physical environment and of the social environment are two important predictors of satisfaction with the health care service that might also influence mood and well-being. Specifically, it should be noted that what is common in studies that address the influence of both physical and social dimensions (see also Andalleb, Siddiqui & Khandakar, 2007; Gotlieb, 2002; Pilpel, 1996; Ziaei et al., 2011) is that normally perceptions of caregivers explain the larger part of variance of patients' satisfaction, but that the physical environment also has a statistically significant positive impact.

How physical environment features lead to well-being: The mediating role of the perception of the hospital's quality of environment

It has long been recognized that the health care physical environment affects patients' well-being. Reference can be made to the study of Dijkstra, Pieterse, and Pruyn (2008) who, using a scenario describing a possible hospitalization, found that a

photo of a hospital room with indoor plants generated less perceived stress to participants than did a room with a painting of an urban environment on the wall. Further, Ulrich's (1984) well-known study showed that patients in a room with a view of everyday nature recovered more rapidly and with more emotional well-being (received fewer negative evaluative comments in nurses' notes) than did patients in similar rooms with a view of a brick wall. Studies mentioned earlier also show this connection. For example, Swan and colleagues (2003) found that appealing rooms result in more favorable patients' judgments of the hospital, stronger intentions to use the hospital again, and stronger intentions to recommend the hospital to others, than typical rooms, and Leather and colleagues (2003) found that the relocated waiting area was associated with improved mood, altered physiological state, and decrease of the self-reported stress scores compared with the traditional waiting area before relocation.

This relationship between health care physical environment and well-being is certainly complex. However, few studies have addressed the psychological processes through which it actually occurs. As described earlier, research has demonstrated that the physical and social environments are the two major dimensions by which patients perceive the quality of the health care environment. In addition, empirical results seem to support the links between these variables and objective physical environment features, as well as with patients' outcomes like satisfaction and emotional well-being. As a whole, this evidence suggests that the perceptions of the quality of the social and physical health care environments can be potential mediators in the relationship between the physical environment features and well-being, but this process was never explicitly tested. For example, using a series of hierarchical regression models, Fornara (2005) analyzed separately the factors (i.e., socio-demographics, objective quality of the physical environment, and the best indicators of perceived quality of hospital physical and social environments) predicting inpatients' and outpatients' satisfaction. Results showed that socio-demographic factors did not affect satisfaction, and the final models revealed that the significant effect of the objective quality of the physical environment became non-significant once the indicators of hospital perceived quality were added. The author raised the hypothesis that the perceptions of quality could play a mediating role, but that hypothesis has not yet been tested.

Therefore, in this study we tested the hypothesis that the relationship between physical environment features and satisfaction is mediated by the perception of the quality of the physical environment and of the social environment (see Figure 3.1).

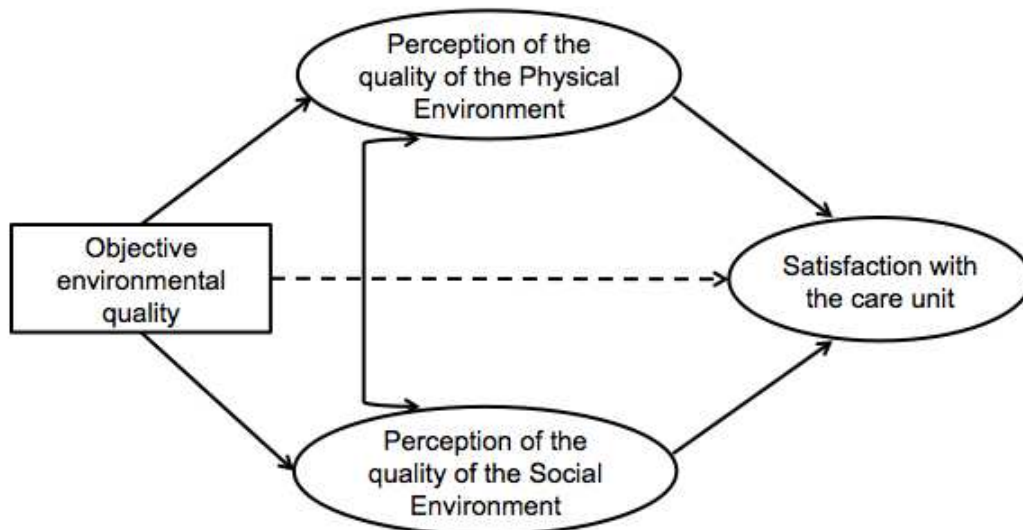


Figure 3.1 Predicted relationship between the objective environmental quality and satisfaction, mediated by the perceptions of the quality of the physical and social environments

Our model proposes that “objective” physical environment features elicit patients’ “subjective” evaluations of the physical and social environments. These perceptions, in turn, will lead to overall satisfaction. In other words, the more the health care setting is humanized, patient-centered, and high-quality design, the higher should be the perception of the quality of the physical environment and of social environment of the care unit. In turn, the higher the perceived quality of the care units’ physical and social environments, the higher should be the patients’ satisfaction.

This model is also supported on some theoretical models concerning a different kind of settings, i.e. the residential places. According to the theoretical model of residential satisfaction from Américo (1995, Américo & Aragonés, 1997) the objective attributes of the residential environment, once they have been evaluated by the individual, become subjective, giving rise to a certain degree of satisfaction. This theoretical framework emphasizes the difference between objective and subjective attributes and distinguishes between the perception of social and physical aspects of the environment as predictors of residential satisfaction, which is similar to what our model proposes in relation to health care settings. In her studies, Américo investigated which perceived environment quality indicators and socio-demographic characteristics predict residential satisfaction and how residential satisfaction influenced certain behaviors, but her theoretical model of residential satisfaction was never fully tested.

Does the situation matter? Inpatients' versus outpatients' views of environmental quality

Being in a hospital as an inpatient or an outpatient is a very different experience. Outpatients are theoretically in a healthier condition, are less dependent on medical and nursing care, spend much less time in the health care setting, and have less contact with doctors, nurses and administrative staff than do inpatients. Inpatients, in turn, stay for at least one night in the hospital, are supposedly in a more delicate condition, and are more dependent on nursing care. These are only some reasons to predict that, for example, perceptions of the hospital physical and social environments may have different relevance for inpatients' and outpatients' satisfaction.

Studies on the impact of physical environment on well-being and satisfaction, as well as research on physical and social dimensions of the perception of quality, have been carried out both in inpatient (e.g., Swan et al., 2003) and outpatient (e.g., Leather et al., 2003) health care settings. However, the relative weight of these dimensions on inpatients' and outpatients' satisfaction has not often been compared.

An exception is the study of Fornara (2005), who tested separately the predictors of inpatients' and outpatients' satisfaction, and found that spatial-physical comfort and relations with staff predicted inpatients' satisfaction, whereas outpatients' satisfaction was predicted only by spatial-physical comfort. These results give us a clue that the way objective environmental quality lead to satisfaction might be different between inpatients and outpatients. However, the whole process from objective environmental quality to perceptions of quality, and from perceptions of quality to satisfaction (Figure 1) was not tested. Moreover, when separated models are used, one can not know if the differences found between the groups are statistically significant.

In the present study we will use a methodological strategy that allow overcoming these limitations by exploring whether inpatients and outpatients differ with respect to the impact of physical environment features on perceptions of physical and social environments, and/or with respect to the impact of those perceptions of the physical and social environment on satisfaction with the care unit. In sum, considering the differences of inpatients and outpatients in terms of their hospital experience, not only we hypothesize that the relationship between the hospital physical environment and patients' satisfaction is mediated by perceptions of the physical and social environments, but also that this process might be moderated by patients' status.

3. Overview of the study

In order to shed light on the relationship between the health care physical environment and patients' satisfaction, the present study investigated the mediating role of the way the physical and social environments are perceived. Additionally, we investigated if this process is moderated by patients' status, that is, if there are any differences between inpatients and outpatients.

Inpatients and outpatients from four different hospitals were asked to evaluate the physical and social environments of the care unit where they were receiving treatment at the moment they were contacted. The physical environments of those care units were also independently evaluated by two architects, in order to get a measure of "objective" environmental quality. This evaluation is important because patients' assessments are a product of individual interpretations subject to the influence of variables such as personality, experience, mood, stress or, in this particular case, perceptions of the social environment.

The study followed most of the theoretical and methodological challenges identified by Winkel, Saegert, and Evans (2009). The proposed contextual model includes the role of the physical and social environments to explain individuals' experience in health care environments and tests some modeling processes, such as the processes by which the physical environment operates on satisfaction (quality perception of physical and social environments as mediating variables), and the variables that alter the impact of physical environment on satisfaction (patients' status as a moderator variable). With regard to methodological advances, this study focused not only on representativeness of the participants, but also on the variability of the settings and environmental characteristics (data were collected in four different hospitals with very different physical features). Moreover, we did not rely only on subjective measurement of the environment, but also on the "objective" assessments of environmental conditions provided by trained experts.

Technical environmental assessments employ mechanical equipment or other physical means to produce reading of environmental quality (Gifford, 2002), such as measurement of the noise level in decibels (e.g., Hagerman et al., 2005). However, not every physical attribute can be measured through mechanical monitoring equipment. Therefore, other studies have used the judgments of experts to obtain an objective assessment of the overall quality of the physical environment (e.g., Durán-Narucki,

2008). These studies assume that experts have the required knowledge and training to judge the quality of specific attributes – such as the materials, maintenance or colors of the floors, walls and ceilings – even though there is no measuring instrument capable of providing a numerical quantification of its quality. On the other hand, observer-based environmental assessments are measures of the quality of the environment as it is experienced by its users, and are based on their human (and lay) perceptual skills (Gifford, 2002). In this study, the objective quality of the care units' physical environment was assessed by trained experts and the users' perception of environmental quality was assessed by patients.

4. Method

Participants and settings

Two hundred and six patients participated in this study, 122 (59.5%) of whom were women. Participants were contacted in inpatient areas and outpatient areas of orthopedic units from four different hospitals. The hospitals were selected to obtain diversity of the settings and participants, but only in orthopedic units to provide consistency across unit type. In short, data was collected in eight different health care settings: four inpatient areas, and four outpatient areas. The sample was composed of 110 (53.4%) inpatients, hospitalized in an orthopedic care unit ($M_{\text{days}}=7.54$; $SD=10.55$; $Mode=2$ days), and 96 (46.6%) outpatients that were waiting for a consultation in the waiting room of an outpatient area ($M_{\text{minutes}}=81.86$; $SD=61.12$; $Mode=60$ minutes).

The age of the subjects ranged from 18 to 88 years with a mean age of 55 years and a standard deviation of 17 years, and the sample of inpatients was significantly older ($M=59.41$, $SD=16.30$) than the sample of outpatients ($M=50.71$, $SD=16.97$) ($F(1,204)=14.055$, $p<.001$). In terms of level of education, 28 patients (13.7%) had university-level education, 42 (20.5%) finished secondary school, 35 (17.1%) had completed 9 years of school, 15 (7.3%) 6 years of school, and 85 (41.5%) completed only 4 years of school or less. The low education of the sample is related with the fact that orthopedic problems are more prevalent in older ages. A chi-square test showed that education level is not equally distributed among inpatients and outpatients ($Chi-square(4) = 23.264$, $p<.001$, $V=.337$). More specifically, more inpatients had only 4 years of school or less ($n=62$), compared to outpatients ($n=23$). The majority of patients

were married ($n=133$, 64.9%), 35 (17.1%) were single, and 37 (18.0%) were separated, divorced or widowed. On average, patients reported they go to a hospital 4.8 times a year. No differences were found in terms of sex, marital status or number of visits to hospitals by year between inpatients and outpatients.

In sum, the samples of outpatients and inpatients are similar in most of the socio-demographic characteristics, except as regards the age and the level of education (two variables highly correlated, $r=.53$, $p<.001$). As a result, the effect of age will be controlled.

Measures

We used one questionnaire for detecting patients' assessments, and one observation grid for collecting the architects' objective evaluation of the hospital physical environment features.

Questionnaire for patients

Measures were collected using a self-report questionnaire (see Appendix B). Perception of the quality of hospital environment was assessed by the PHEQIs (Andrade, Lima, Fornara, & Bonaiuto, 2012), namely the Care unit & In-/Out-patient (waiting) area Scale (which regards the perceived quality of spatial-physical aspects of the hospital care unit) and the Social-functional features Scale (which regards the perceived quality of social-functional aspects). Items are defined as sentences that express environmental evaluations (e.g., "In this in-patient/waiting area the quality of furnishings is good"), and responses are made on 5-point *Likert*-type scales (from 0 "totally disagree" to 4 "totally agree"). Each scale contains both positive (i.e., indicating the presence of quality) and negative (i.e., indicating the absence of quality) items, in order to control for response set.

The Care unit & In-/Out-patient (waiting) area scale has four factors of environmental quality perception: Spatial-physical comfort (6 items, $\alpha=.83$), Orientation (4 items, $\alpha=.73$), Quietness (2 items, $\alpha=.64$), and Views and lighting (3 items, $\alpha=.66$); and the scale on Social-functional features has two factors, Care for social and Organizational relationship (6 items, $\alpha=.76$), and Privacy (3 items, $\alpha=.59$).

Satisfaction with the care unit was measured through the following four questions (Raposo, Alves, & Duarte, 2008): “Considering your global experience in this care unit, in general, how satisfied are you?”, “To what extent does this care unit meet your expectations?”, “To what extent does this care unit meet your needs?”, and “Imagine now an Orthopedic care unit, perfect in all its aspects. How far do you think this care unit is from a perfect care unit?”. Responses to these items were recorded on a 11-point scale ranging, respectively, from (0) “very unsatisfied” to (10) “very satisfied”, from (0) “not at all” to (10) “totally”, from (0) “not at all” to (10) “totally”, and from “very distant” to “very close”.

Instrument for Experts’ objective evaluation

Objective evaluation of the physical environment was done by two independent judges with a theoretical background in architectural design issues, who observed in detail the physical places where patients were contacted to participate in the study: four outpatient areas and four inpatient areas. Judges were trained to use the checklist and informed that in their evaluation they should consider the function and objectives of the place and the needs of the users, and not their own general preferences. Data were collected by means of an expert checklist that covered the same issues as the Care unit & In-/Out-patient (waiting) area PHEQI scale (see Fornara et al., 2006), except as regards the Quietness dimension (see Appendix D). The checklist has 29 items related with specific features of the physical environment (e.g., number of places to sit; quality of the furniture). The more abstract items were combined with specific attributes that should be taken into account (e.g., to rate the quality of the furniture judges should consider materials, shape, style, stability, adequacy for different users, and back and arm support). Items were rated from 0 to 4 with the categories of inadequate, minimal, satisfactory, good, and excellent. Interjudge agreement was strong, $r(276)=.66$, $p<.01$.

Procedure

The study was approved by the “Central Administration of the Health System” (ACSS) Portuguese public institute, which helped us to identify and to contact each of the four hospitals that took part of the study. We then sent a letter to the administration of the hospitals explaining the purpose of the study and asking for a meeting with members of the administration and with the directors of the orthopedic care units. We

explained every detail of the method, and we stressed the importance of the collaboration of the healthcare professionals in identifying the patients that could participate. The members of the administration of the four hospitals and the directors of all care units approved the study and accepted to collaborate.

Data was collected between October and December 2009. There were no inclusion criteria other than age (above 18) and willingness to participate in the study. Outpatients were contacted by the first author in the waiting area before consultation, and inpatients were contacted in their hospital rooms.

As outpatients filled the questionnaire in the waiting room (and before consultation), they were included in the final sample only if they had been in that care unit at least once, to ensure that they would have sufficient information to evaluate both the physical and social environment of the care unit, as well as satisfaction with the service. Because of that, 13 outpatients were excluded from the sample. From those who were kept in the sample, 63 (66.3%) had been in that outpatient care unit more than four times, 24 (23.5%) had been two or three times, and only 8 (8.4%) had been there once before.

Inpatients were in the hospital for at least one day. Taking into account the inclusion criteria, potential participants were identified by the healthcare professionals. All patients identified were asked to take part of the study. When inpatients accepted to participate, the questionnaire was left with them and collected the next day. From the inpatients that accepted to participate, 50 (45.5%) had been in that care unit before. More specifically, 15 (30.0%) of them had been more than 4 times, 12 (24.0%) had been two or three times, and 23 (46.0%) had been once.

Researchers were informed that neither the outpatient nor the inpatient care units were subject to changes in terms of physical conditions or in terms of the core of the staff team in the recent years. All patients (inpatients and outpatients) were informed of the nature and purpose of the study, and confidentiality was assured. It was emphasized that their decision to participate in the study would not affect their care, and that hospital personnel would not see the information provided. When patients did not have the physical abilities to read or to answer the questionnaire on their own, data were collected through an interview that lasted approximately 30 minutes. The instructions clearly asked patients to respond to the questionnaire focusing on the particular care unit where they were at the moment.

Data analysis

The hypotheses were tested on a series of structural equation models (SEM) using the AMOS 17 software (Arbuckle, 2006). SEM allow to specify and estimate models of relationships between measured (observed) and latent variables (constructs that are not directly measured) (MacCallum & Austin, 2000). Our independent variable “objective environmental quality” is an observed variable, whereas perception of the quality of physical environment, perception of the quality of social-functional environment and satisfaction with the care unit were defined as latent variables with four, two and four indicators, respectively (see Figure 1). The objective is to obtain the most parsimonious summary of the relationships between the variables that accurately represents the associations observed in the data (Weston & Gore, 2006). Specifying a model including latent variables is important because it allows estimating the parameters that represent the relationships between the variables while controlling for error of measurement (Bollen, 1989). Models were calculated from the variance-covariance matrix of the indicators that was obtained using pairwise deletion for missing data. Initially, we estimated the parameters of the model for the whole sample considering inpatients and outpatients. We then repeated the procedure using multi-group analyses. In all the analyses, standard errors of parameters were estimated according to the method of maximum likelihood. To evaluate the global adjustment quality of the model we considered the CFI (Comparative Fit-Index) and GFI (Goodness-of-Fit Index) above .90, the χ^2 /degrees of freedom ratio around 2, and the RMSEA (Root Mean Square Error of Approximation) below .05 as indicating a good fit of the model to the data (e.g., Schumacker & Lomax, 1996).

5. Results

Preliminary analysis

Objective evaluation of the physical environment

The mean score between the two experts’ evaluations of each inpatient area and outpatient area was computed (see Table 3.1) in order to use a more reliable score of

objective environmental quality, which was used as the independent variable in the mediation analyses. Results show that hospitals' orthopedic care units vary in terms of objective physical environment quality. Hospitals 1 and 2 have inpatient and outpatient areas with lower physical environmental quality than do hospitals 3 and 4.

Table 3.1 Means of the experts' evaluations of the health care settings

	H1	H2	H3	H4
Inpatient area	2.21	1.35	2.48	2.99
Comfort	2.46	1.06	2.34	2.77
Orientation	1.75	0.75	2.13	2.70
Views and lighting	2.42	2.25	2.97	3.50
Outpatient area	2.26	1.94	2.94	3.10
Comfort	1.56	1.60	2.36	3.31
Orientation	2.86	2.14	3.00	3.29
Views and lighting	2.37	2.08	3.45	2.70

Note: H to H4 = Hospital 1 to Hospital 4. Values in bold compose the variable

“objective environmental quality”.

Descriptive statistics and reliability analysis

Table 3.2 presents the descriptive statistics and Table 3.3 presents the correlations between the indicators used in the proposed model.

Table 3.2 Means and standard deviations of the variables

	Inpatients	Outpatients
	Mean (SD)	Mean (SD)
<i>Satisfaction with the care unit</i>		
Sat 1	8.09 (2.02)	6.92 (2.04)
Sat 2	8.14 (2.14)	7.03 (2.23)
Sat 3	8.05 (2.31)	7.27 (2.30)
Sat 4	7.33 (2.51)	6.37 (2.69)
<i>Perception of the quality of the Physical environment</i>		
Comfort	2.74 (1.03)	2.17 (1.00)
Orientation	3.04 (0.96)	2.67 (0.94)
Quietness	2.90 (1.33)	3.15 (0.93)
Views and lighting	3.18 (0.94)	2.26 (1.23)
<i>Perception of the quality of the Social-functional environment</i>		
Care for social and organizational relationships	3.02 (0.91)	2.80 (0.87)
Privacy	3.17 (0.88)	2.16 (1.11)
<i>Objective environmental quality</i>	2.21 (0.54)	2.46 (0.46)

In general, results show that patients are satisfied with the care units and have positive perceptions of the quality of its physical and social environments. Specifically, inpatients are more satisfied ($F(1,203)=12.25, p<.001$) and perceive higher levels of physical and social environment quality, particularly with regard to comfort ($F(1,204)=16.40, p<.001$), orientation ($F(1,202)=7.58, p<.01$), views and lighting ($F(1,204)=37.00, p<.001$) and privacy ($F(1,200)=51.24, p<.001$), than do outpatients. All the correlations are positive, ranging from weak to moderate, which indicates that they are measuring different constructs, avoiding any multicollinearity issues.

Table 3.3 Correlation matrix of the items

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<i>Satisfaction with the care unit</i>											
Sat 1 (1)		.86***	.79***	.71***	.41***	.47***	.17	.34**	.49***	.12	.37***
Sat 2 (2)	.90***		.83***	.68***	.43***	.42***	.06	.33**	.44***	.15	.35**
Sat 3 (3)	.81***	.81***		.71***	.31**	.27**	.05	.21*	.43***	.12	.24*
Sat 4 (4)	.74***	.77***	.73***		.38***	.29**	.11	.20	.37***	.24	.30**
<i>Perception of the quality of the Physical environment</i>											
Comfort (5)	.35***	.37***	.37***	.49***		.50***	.19	.54***	.50***	.24	.63***
Orientation (6)	.15	.21*	.09	.30**	.38***		.34**	.42***	.55***	.12	.42***
Quietness (7)	.22*	.24*	.16	.32**	.46***	.37***		.20	.32**	.18	.08
Views and lighting (8)	.12	.17	.13	.23*	.46***	.31***	.47***		.51***	.13	.60***
<i>Perception of the quality of the Social-functional environment</i>											
Care for social and organizational relationships (9)	.50***	.53***	.45***	.48***	.41***	.28**	.37***	.44***		.48***	.44***
Privacy (10)	.11	.16	.12	.14	.30**	.23*	.22*	.36***	.32**		.17
Objective environmental quality (11)	.21*	.23*	.23*	.36***	.62***	.30**	.29**	.17	.26**	.23**	

Note. Correlation matrix's diagonal was omitted. Values above the diagonal are correlations for outpatients, and values below the diagonal are correlations for inpatients.

* $p < .05$; ** $p < .01$; *** $p < .001$.

In order to check the construct validity of the proposed measurement model we conducted a Confirmatory Factor Analysis (CFA) (Bollen, 1989). In this model, we specified three conceptual latent variables (i.e., perceived quality of physical environment, perceived quality of social environment, and satisfaction) that were allowed to correlate. In order to guarantee the statistical identification of the models, the factorial loading of one of the indicators of each latent variable was constrained at 1.00. Results showed a good fit to the data: $\chi^2(32, N=206)=55.73$, $p < .01$, $\chi^2/df=1.74$, CFI=.98, GFI=.95, RMSEA=.06, and factorial loadings were high on their respective factor (varying from .42 to .95). These results were compared to an alternative measurement model in which all items loaded on a general factor, meaning that all items measure only one latent variable. Result for this model showed a poor fit to data ($\chi^2(35, N=206)=229.31$, $p < .001$, $\chi^2/df=6.55$, CFI=.83, GFI=.76, RMSEA=.16). Thus, the proposed measurement model fits better than does the alternative one, $\Delta\chi^2(3)=173.58$, $p < .001$, supporting the construct validity of the proposed measurement model.

Mediation Analyses

To test the hypothesis that the relationship between objective environmental quality and satisfaction is mediated by the perceived quality of both physical and social environments we followed the procedures commonly recommended for the analysis of mediation using structural equations models (e.g., Kenny & Judd, 1984).

Results show that the total effect of objective environmental quality on satisfaction (corresponding to the effect of objective environment before taking in to account the physical environment and social-functional environment perceived quality in the model) is significant ($\beta=0.22$, $p < .01$), which means that the greater the level of objective environmental quality, the greater the patients' satisfaction with the care unit.

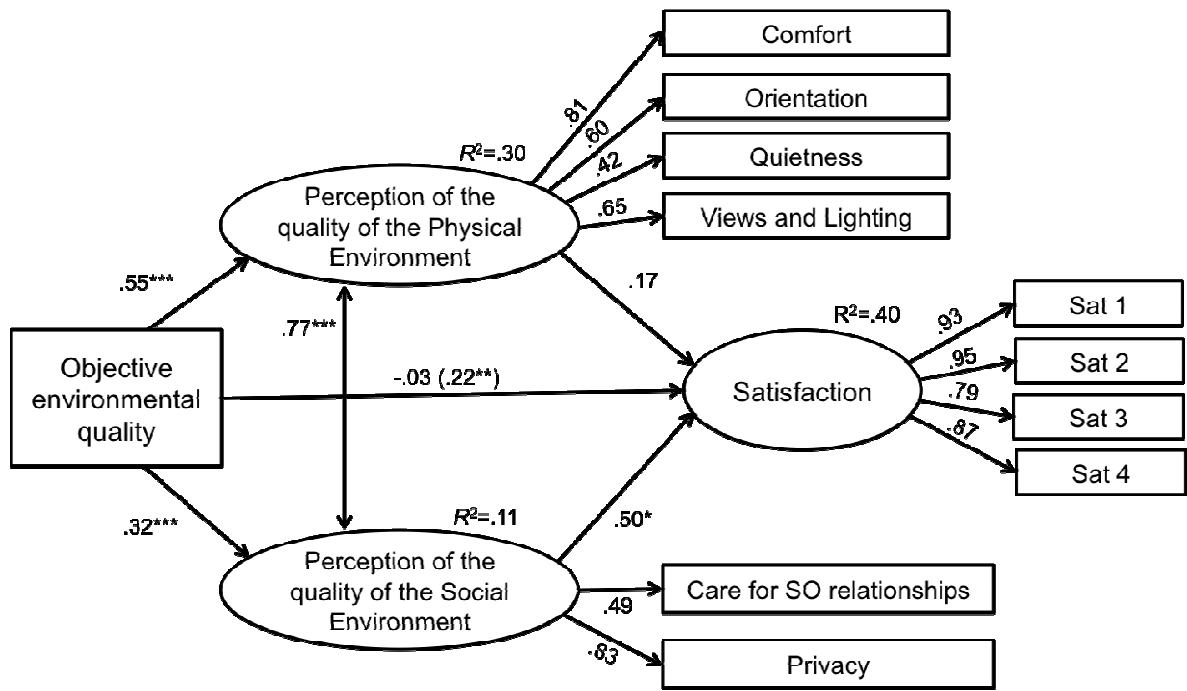


Figure 3.2 Standardized maximum likelihood coefficients for the structural equation model depicting the relationship between objective environmental quality and patients' satisfaction, mediated by perception of the quality of the physical and social environments.

Note: Coefficient in brackets is the total effect and it was estimated before considering the two mediators in the model.

* $p < .05$, ** $p < .01$, *** $p < .001$

As one can see in Figure 3.2, the relationship between objective environmental quality and the two types of environmental quality perception are positive and significant, i.e., greater objective environmental quality implies greater perception of the quality of both the physical environment ($\beta = .55$, $p < .001$) and of the social-functional environment ($\beta = .32$, $p < .001$). On the other hand, the effect of the perceived quality of social-functional environment on well-being is significant ($\beta_{\text{PQSFE-Sat}} = .50$, $p < .05$), whereas the perceived quality of physical environment does not reliably predict satisfaction. Finally, the direct effect of objective environmental quality on satisfaction is not significant, suggesting that the effect of objective quality on well-being could be mediated by perceptions of the quality of the environment. The correlation residual between physical environment quality perception and social-functional environment quality perception is strong and significant ($r = .77$, $p < .001$). Of greater importance for the mediation test, the analysis of the decomposition of the effects of objective environmental quality on satisfaction indicates that only the perceived quality of social-

functional environment mediates this relationship (Mediated effect=.16; $Z_{\text{Sobel}}=1.93$, $p<.05$, one-tailed).

The three independent latent variables accounted for 40% of the variance in satisfaction and analyses of the goodness-of-fit indices for the proposed model show a good fit to the data: $\chi^2(39, N=206)=80.51$, $p<.001$, $\chi^2/df=2.06$, CFI=.97, GFI=.94, RMSEA=.07. These results show the construct validity of the measures we used to test our predictions.

As differences between inpatients and outpatients were found in terms of age (inpatients are significantly older), we conducted a supplementary analysis in which we estimated the same mediation model, now controlling for the effect of age. Although results show that age has a significant effect on the perception of the quality of the physical environment, the relationships between the variables objective environmental quality, perceptions of the quality of the physical and social environments, and satisfaction with the care unit remained virtually the same. In other words, the effect of age do not affect the process by which objective environmental quality results in more satisfaction with the care unit, through perceptions of the quality of the hospital environment. More specifically, again, only the perceived quality of social-functional environment mediates this relationship (Mediated effect=.16; $Z_{\text{Sobel}}=1.84$, $p<.05$, one-tailed). Therefore, the potential differences between inpatients and outpatients regarding the effect of objective environmental quality on satisfaction by means of perceptions of the quality of the hospital environment are not due to differences in terms of age.

Inpatients vs. Outpatient

We analyzed the invariance of the structural model in order to test whether the social-psychological process going from objective quality of the physical environment to satisfaction occurs in the same way for both inpatients and outpatients. In other words, we tested if the mediation process between objective quality of the physical environment and satisfaction is moderated by patients' status using multi-group analysis.

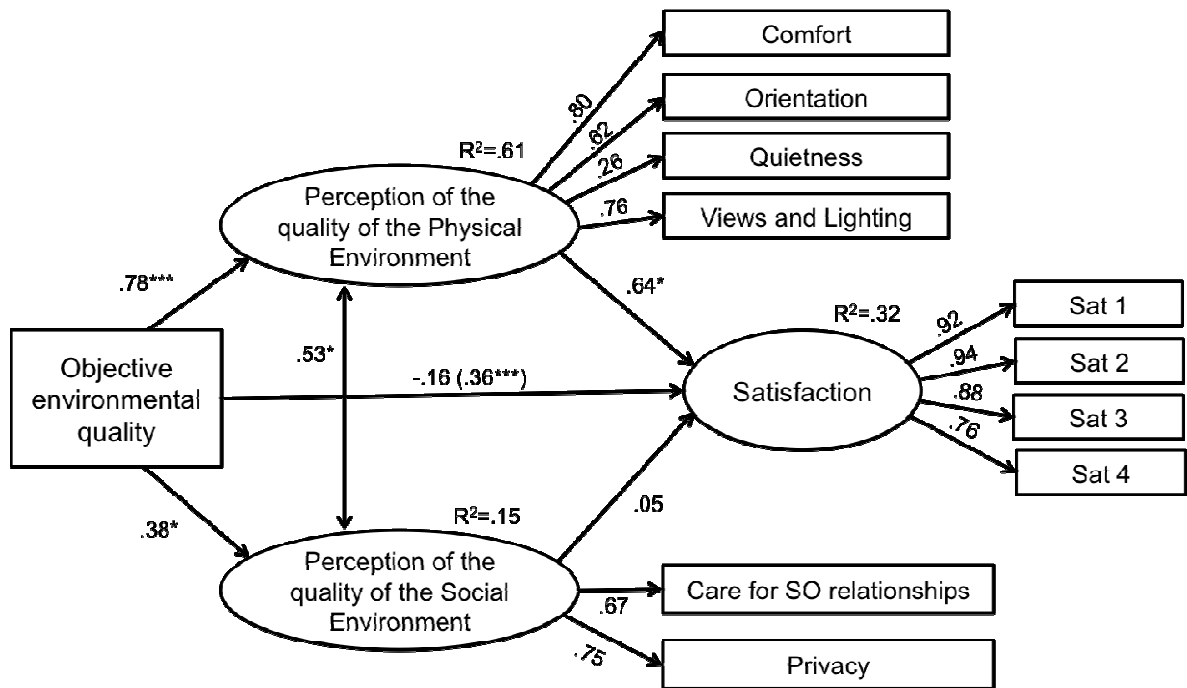


Figure 3.3. Standardized maximum likelihood coefficients for the multi-group analyses for outpatients.

Note: Coefficient in brackets is the total effect and it was estimated before considering the two mediators in the model.

* $p < .05$, ** $p < .01$, *** $p < .001$

First, we calculated a baseline model where we allowed the structural parameters to be freely estimated between groups of inpatients and outpatients. The measurement error variances of the two indicators of perceived quality of the social environment were constrained to equality across groups for purposes of statistical identification of the factor. The goodness-of-fit for this model is good, $\chi^2(79, N=206)=168.40, p < .001, \chi^2/df=2.13, CFI=.93, GFI=.88, RMSEA=.07$, showing that the proposed model fits well the data (see Figures 3.3 and 3.4).

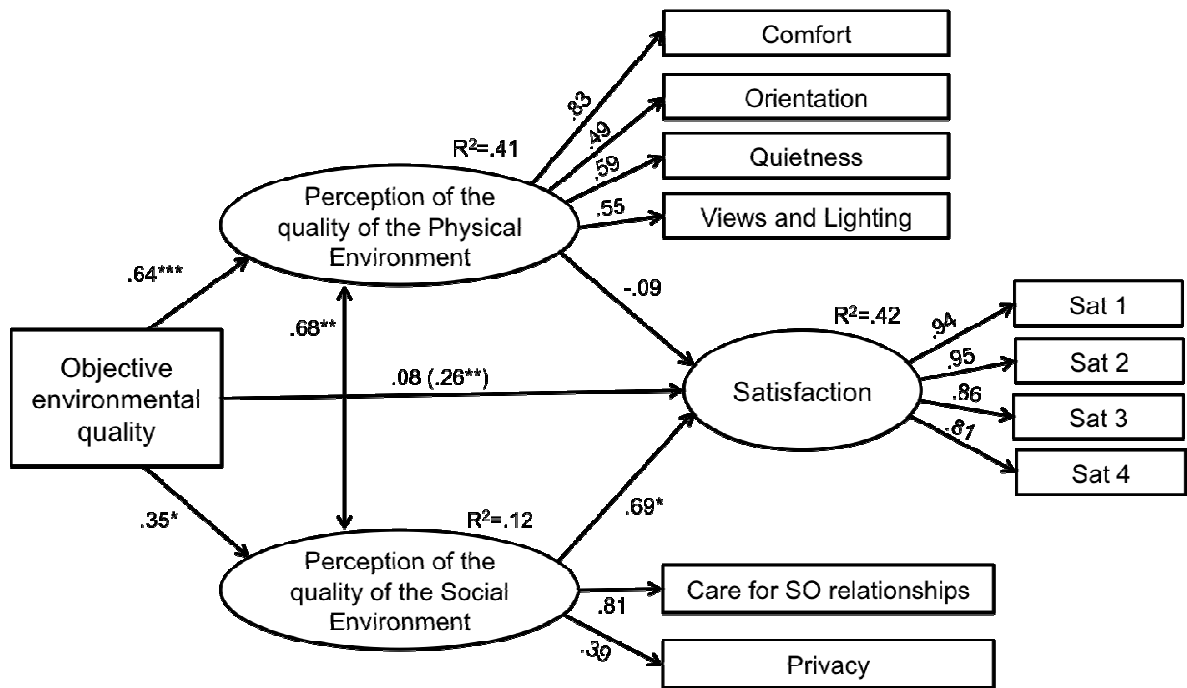


Figure 3.4. Standardized maximum likelihood coefficients for the multi-group analyses for inpatients.

Note: Coefficient in brackets is the total effect and it was estimated before considering the two mediators in the model.

* $p < .05$, ** $p < .01$, *** $p < .001$

For both inpatients and outpatients, objective environmental quality predicts the perceived quality of the physical environment and the perceived quality of the social-functional environment. Moreover, for inpatients only the relationship between the perception of the quality of the social-functional environment and satisfaction is positive and significant, whereas for outpatients only the relationship between the perception of the quality of the physical environment and satisfaction is positive and significant.

As one can see in Table 3.4, which shows the decomposition of the effects of objective environmental quality on well-being, the total effect of objective environmental quality on well-being is significant and greater than that of the direct effect both for inpatients and outpatients. Moreover, results show that the relationship is mediated by the perceived quality of the social-functional environment for inpatients (Mediated effect = .24; $Z_{Sobel} = 1.51$, $p < .07$, one-tailed), whereas for outpatients the relationship is mediated by the perceived quality of the physical environment (Mediated effect = .50; $Z_{Sobel} = 2.11$, $p < .05$, one-tailed).

Table 3.4 Decomposition of the effects of objective environmental quality on satisfaction, by group of patients

	Total effect	Indirect effects through		Direct effect
		<i>Perception of the quality of the Physical environment</i>	<i>Perception of the quality of the Social-functional environment</i>	
Outpatients	.36***	.50*	.02	-.157 ($p=.447$)
Inpatients	.26**	.06	.24‡	.008 ($p=.575$)

Note: Indirect effects were calculated according to the Sobel's Test. ‡ $p < .07$; * $p < .05$;

** $p < .01$; *** $p < .001$.

In a second phase, we constrained the parameters of the structural model to equality between inpatients and outpatients. Results indicate that the fit of the constrained model is not so good as the baseline model ($\chi^2(84, N=206)=179.416$, $p < .001$; $CFI=.92$, $GFI=.70$, $RMSEA=.07$). In fact, there is a reliable difference between these models, $\Delta\chi^2(5)=11.01$, $p = .05$, indicating that, as predicted, the situation of patient moderated the meditating role of the perceived quality of environment.

Additionally, in order to identify what the specific paths are moderated by the patients' status; we first estimated a model constraining the parameters of the effects of objective environmental quality on the perceived quality of the physical environment and on the perceived quality of the social-functional environment. Results showed that the fit of this model is not reliably different from the baseline ($\Delta\chi^2(2)=4.59$, $p=.10$), indicating that the patients' status did not moderate these relationships. Then, we estimated other model in which we constrained the effects of the perceptions of the quality of the physical and social-functional environments on satisfaction, first both of them, and then one at a time. The results showed that the fit of the baseline is significantly better than the fit of the constrained model, $\Delta\chi^2(2)=7.30$, $p < .05$, indicating that the patient's status moderate the effects of the perceptions of the quality of the hospital environment on satisfaction. More specifically, we found that is the effect of the perceived quality of the social-functional environment on satisfaction, $\Delta\chi^2(1)=6.841$, $p < .01$, more than the effect of the perceived quality of the physical environment, $\Delta\chi^2(1)=3.739$, $p=.053$, that differs between inpatients and outpatients.

6. Discussion

The influence of the surrounding physical environment on the way people behave, feel and think is a longstanding topic of research and has implications for health care environments. Studies have shown that the health care physical environment affects patients' well-being in several ways, but little attention has been paid to the underlying mechanisms. The current study fills this gap by testing the general hypothesis that the relationship between the health care physical environment conditions and satisfaction with the care unit is mediated by perceptions of the quality of physical and social environments. In addition, we examined whether this process is moderated by the patients' status, that is, if it occurs differently for patients that are hospitalized over the course of a few days (inpatients) and patients that are only waiting for a consultation (outpatients).

Direct (unmediated) and indirect (mediated) relationships involving objective environmental quality, perceptions of the quality of physical and social environments, and satisfaction were tested through structural equation modeling, and moderation of patients' status (i.e., inpatients *vs.* outpatients) was tested by multi-group analyses. Results confirmed the hypothesis that health care physical environment conditions affect satisfaction through the perception of environmental quality. That is, in health care settings with higher quality in terms of physical conditions patients are more satisfied because their perceptions of the environment of the care unit are more positive. Analyses with the total sample (inpatients and outpatients pooled) showed that the relationship between health care physical environment conditions and satisfaction is mediated by the perception of the quality of the social-functional environment. Specifically, objective environmental quality predicts the perception of the quality of the physical environment (in terms of aspects related with spatial-physical comfort, orientation, quietness, views and lighting) and of the social environment (in terms of aspects related with social and organizational relationships, and privacy). However, only the perception of the quality of the social-functional environment affects patients' satisfaction. The same results were found when controlling for age, which is a variable that distinguishes our samples of inpatients and outpatients, meaning that the differences found are not due to differences in terms of age. Although the relationships

observed between the variables of this model have already been studied by a large number of authors, no study had as yet proposed an holistic model construing these relationships in terms of a mediation process.

Moreover, multi-group analyses showed that objective environmental quality predicted satisfaction throughout different processes depending on patients' status. For both inpatients and outpatients, objective environmental quality predicts the perception of the quality of both the physical and social environments. However, for inpatients (as for the total sample), it is the perception of the quality of the social environment that mediates the relationship between objective environmental quality and satisfaction, whereas for outpatients it is the perception of the quality of the physical environment. This means that patients' status moderated the process linking objective environmental quality and satisfaction. Inpatients' satisfaction is affected by the way they perceive relationships with staff and organization of the care unit, whereas outpatients' satisfaction is chiefly affected by how good they perceive the physical environment to be.

We might wonder why these differences were found. It is plausible that inpatients' satisfaction is mostly affected by perceptions of social environment because, compared to outpatients, these patients are especially dependent on medical and nursing care. In fact, inpatients are directly and continuously embroiled in an interpersonal relationship with the staff and operational processes of the care unit. Additionally, their priority and their primary concerns are disease relief and a complete recovery, so they can return home in good health. Accordingly, health professionals, the organization of the service, and privacy are crucial, which consequently explains that inpatients' feeling of satisfaction is mostly explained by their perception of the quality of the social-functional environment. This result does not exclude the possibility that the physical environment of the inpatient area directly or indirectly can influence other relevant patients outcomes not included in this study. For example, previous research showed that the quality of the physical environment has an impact on physiological parameters, emotional state, recovery time, and stress (e.g., Dijkstra et al., 2008; Hagerman et al., 2005; Ulrich, 1984). In addition, it can be also possible that for these patients the influence of the perceived quality of the physical environment on satisfaction is mediated by their perceptions about the social environment.

For outpatients, in contrast, it is the perceived quality of the physical environment that predicts satisfaction. Following the previous reasoning, these patients

are often in better health and less in need of health professionals' care than are inpatients. Consequently outpatients may be more open to considering other dimensions of health care service when evaluating their satisfaction, including the quality of the physical environment. What we found somewhat unexpected was the absence of a significant impact of the social environment on outpatients' satisfaction, since the literature shows that the social environment tends to be a crucial factor. An explanation for this result could be that outpatients were contacted in the waiting area, before the doctor consultation (since it would be very difficult to have outpatients participating after the consultation). So, it could be possible that our study had depicted a "first impression" of the care unit, conveyed basically by the physical environment (at the moment patients had only been in contact with the administrative workers). However, only patients who were in the care unit for at least the second time were selected, so they could use their previous experience to make their evaluations. In fact, 90% of them had been before in the same care unit two or more times. Moreover, in this study quality of the "social-functional environment" was not defined exclusively as the quality of the relationship with doctors and nurses, but staff in general, and includes the perceptions about other aspects such as the organization of the service and privacy issues. Considering all this, the argument that outpatients' perceptions of social environment do not affect satisfaction because they answered the questionnaire before consultation becomes unsatisfying. The result that only perceived quality of the physical environment predicts outpatients' satisfaction is not new (Fornara, 2005), which gives us additional confidence to infer that for outpatients – who often go to quick consultations to manage minor ailments or to request for a renewal of a prescription – the comfort and the appearance of the care unit setting have a particular impact.

The moderation by patients' status demonstrates the complexity of the mechanisms connecting physical environment and patients' well-being. However, it must be stressed that it is not the effect of the objective physical environment on perceptions of quality that differs between inpatients and outpatients, but rather the contributions of perceived quality of physical and social environment to satisfaction. Nevertheless, these findings corroborate that patients' satisfaction can be enhanced by improving the hospital physical conditions, which has important implications for health care services planning, design, and maintenance.

We believe it is important to draw attention to another finding, even if it is not directly related to our hypothesis. Results showed that inpatients perceive higher levels

of physical environmental quality than do outpatients, despite the fact that inpatient areas were generally evaluated by architects as having lower quality than were outpatient areas. The same difference tends to occur in relation to the social environment, but in this case there is no objective assessment against which to compare.

This paradoxical result may be interpreted within the cognitive theory of stress (Lazarus & Folkman, 1984). This theory states that the appraisal of a relationship between the person and the environment as irrelevant, benign or stressful depends on the interpretation of its significance to well-being (primary appraisal), and of the coping options available (secondary appraisal). In a hospital setting, inpatients might supposedly be more vulnerable to stress than outpatients, not only because they might be in poor health and more physically and psychologically impaired, and so with less resources to deal with the demands, but also because they might actually need to deal with more sources of stress than do outpatients. For example, besides all the illness-related demands, inpatients need to adapt to a strange and uncomfortable environment for which they often have little control (for example, virtually all inpatients who participated in this study were accommodated in multiple rooms). More than being in a waiting room for some hours, inpatients necessarily have to experience the hospital room and care unit as if it was their “home”, since they spend at least one night in the hospital. However, they might also be more prompt to reappraise or to cope with this specific external demand – the conditions of the physical environment. On the one hand, in fact, the physical conditions of the inpatient area are not amenable to be changed by the patients; on the other hand, inpatients might need to engage in coping with other – more “relevant” – aspects of the situation which they are going through (e.g., dealing with pain and incapacitation, developing adequate relationships with professional staff, preparing for an uncertain future, etc.; Moos & Tsu, 1977). Thus, inpatients – more than outpatients – might use an emotion-focused coping (Lazarus & Folkman, 1984) directed at changing (not the physical conditions, but) the meaning of the physical conditions. According to the Taylor’s theory of Cognitive Adaptation (e.g., Taylor, 1983; Taylor, Wood, & Lichtman, 1983; Taylor & Brown, 1988), it is plausible that inpatients may develop unrealistic positive perceptions of the physical environment, which could lower their emotional distress, and help them to cope better with other stressful aspects of the hospital experience. For example, inpatients may use cognitive strategies that enable them to tolerate, accept, and minimize the non ideal hospital’ physical environment by making comparisons to hypothetically worse situations, by highlighting its benefits, or

by maintaining that they are coping very well with the actual conditions. Such cognitive adaptation strategies would result in more positive evaluations of the inpatient area's physical conditions. Regarding the tendency for overestimation of the social environment (although we do not have the objective data to compare), we can make reference to the study of Baillie (2009), who interviewed patients and nurses in order to investigate patients' dignity in acute hospital settings, how it is promoted, and threatened. Most of the patients described adopting an attitude of acceptance and using humor to counteract threats to dignity (e.g., lack of privacy, curt or authoritarian staff behavior), which seemed to make them feel more comfortable. Some have also explicitly referred to developing good relationships with staff as a way to have a positive impact on how staff related to them. Baillie's study seems to demonstrate that patients promote their own dignity through their attitudes and ability to rationalize the situation, in relation to both the physical and the social environments.

Additional support to this idea is given by the fact that, in general, inpatients evaluate the quality of the physical and social environments of the inpatient area as significantly better than do visitors and staff (e.g., Devlin, 1995), meaning that patients tend to somehow adjust their expectations and modulate their attitudes. Therefore, future research could focus on identifying the role of (different sources of) stress and coping on how patients deal with their experience in healthcare facilities (see Ulrich, 1991). Lastly, and more pragmatically, it would also be plausible that inpatients could feel pressured by normative concerns to express positive opinions, fearing that health professionals could identify them. Consequently, they may have provided answers that they believed were desirable.

The high correlation between perceptions of the physical and social environment is also important to emphasize. This association might result from a bi-directional influence between these perceptions. The perception that the physical environment is neat, well maintained, and attractive may influence the perceptions of social environment in a positive fashion, reflecting that staff is concerned with patients' general well-being, so they invest time and money to provide patients with good conditions. Patients may also infer that the service is well organized, and that health care staff like their workplace and thus take good care of it. On the other hand, if staff is kind and caring, and if patients feel their privacy is assured, they will look more positively on the physical environment. Future studies should disentangle this relationship. Is it mostly the perception of the social environment that influences

perception of physical environment or does this influence occur in both directions? This question remains to be addressed in the literature.

In fact, although the results reported here support our hypotheses, this study has an important limitation: its correlational nature. The correlational design weakens the evidence in support of the direction of the relationship between perceptions of environment and well-being. In fact, the proposed model is based on the hypothesis that there is a process that runs from perception of environmental quality to satisfaction. These results, however, do not exclude the possibility that satisfaction also affects environmental quality perception, in a bi-directional way. Other limitations relate to the fact that we had no indicator for objective quality of the social environment. Although the objective of the study was to investigate the process from objective quality of physical environment to well-being, a hard measure of the quality of the social environment would provide a more comprehensive picture.

This study provided some answers but also many additional challenging questions, which confirms that there is much more to investigate regarding the role played by physical environmental features of the hospital on patients' well-being. Our research extends beyond earlier studies because it gives a contribution to the understanding of how the process occurs for different types of patients. The present study provided evidence for one indirect way through which the physical environment affects patients' satisfaction (mediated by environmental quality perception) and demonstrated how this process works differently depending on the patients' status. This study suggests that hospitals can use the physical environment to promote patients' perceptions of quality and satisfaction with the services. More specifically, particular care should be provided so that the physical environments of outpatient care units are comfortable, well designed, and well-maintained. Further, staff members of inpatient care units should be aware of their great impact on patients' well-being.

Future research on the relevance of the health care physical environment for well-being will profit from an increasing focus on the psychological processes that intervene between the physical environment and the person and that adequately take into account the physical and social contexts in their objective and subjective components.

7. References

- Amérigo, M. (1995). *Satisfacción residencial. Un análisis psicológico de la vivienda y su entorno*. Madrid, España: Alianza Editorial.
- Amérigo, M. & Aragonés, J. I. (1997). A theoretical and methodological approach to the study of residential satisfaction. *Journal of Environment Psychology*, 17, 47-57.
- Andaleeb, S. S., Siddiqui, N., Khandakar, S. (2007). Patient satisfaction with health services in Bangladesh. *Health Policy and Planning*, 22, 263-273.
- Andrade, C., Lima, M.L., Fornara, F., & Bonaiuto, M. (2012). Users' views of hospital environmental quality: Validation of the Perceived Hospital Environment Quality Indicators (PHEQIs). *Journal of Environmental Psychology*, 32, 97-111.
- Arbuckle, J. L. (2006). Amos (Version 7.0) [Computer Program]. Chicago: SPSS.
- Arneill, A., & Devlin, A. S. (2002). Perceived quality of care: the influence of the waiting room environment. *Journal of Environmental Psychology*, 22, 345-360.
- Baillie, L. (2009). Patient dignity in an acute hospital setting: A case study. *International Journal of Nursing Studies*, 46, 23-37.
- Becker, F., Sweeney, B., & Parsons, K. (2008). Ambulatory Facility Design and Patients' Perceptions of Healthcare Quality. *Health Environments Research & Design Journal*, 1(4), 35-54.
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York: John Wiley & Sons.
- Devlin, A. S. (1995). Staff, patients, and visitors: Responses to hospital unit enhancements. In J. L. Nasar, P. Grannis, & K. Hanyu (Eds.), *Proceedings of the 26th annual conference of the Environmental Design Research Association* (pp. 13-117). Oklahoma City, OK: EDRA.

- Devlin, A. S., Donovan, S., Nicolov, A., Nold, O., Packard, A., & Zandan, G. (2009). "Impressive?" Credentials, family photographs, and the perception of therapist qualities. *Journal of Environmental Psychology, 29*, 503–512.
- Dijkstra, K., Pieterse, M. E., & Pruyn, A. T. H. (2006). Physical environmental stimuli that turn healthcare facilities into healing environments through psychologically mediated effects: systematic review. *Journal of Advanced Nursing, 56*, 166–181.
- Dijkstra, K., Pieterse, M. E., & Pruyn, A. T. H. (2008). Stress-reducing effects of indoor plants in the built healthcare environment: the mediating role of perceived attractiveness. *Preventive Medicine, 47*, 279-283.
- Durán-Narucki, V. (2008). School building condition, school attendance, and academic achievement in New York City public schools: A mediation model. *Journal of Environmental Psychology, 28*, 278–286.
- Fornara, F. (2005). Users' Evaluative Responses to Spatio-Physical Humanization: The Case of Hospital Environments. In B. Martens, A. G. Keul (Eds.), *Designing Social Innovation: Planning, Building, Evaluating* (pp. 231-240). Gottingen (Germany): Hogrefe & Huber.
- Fornara, F., Bonaiuto, M., & Bonnes, M. (2006). Perceived Hospital Environment Quality Indicators: A study of orthopaedic units. *Journal of Environmental Psychology, 26*, 321-334.
- Gifford, R. (2002). *Environmental psychology: Principles and practice* (3rd. ed.). Canada: Optimal Books.
- Gosling, S. D., Ko, S. J., Mannarelli, T., & Morris, M. E. (2002). A room with a cue: Personality judgments based on offices and bedrooms. *Journal of Personality and Social Psychology, 82*, 379–398.
- Gotlieb, J. B. (2002). Understanding the effects of nurses on the process by which patients develop hospital satisfaction. *Holistic Nursing Practice, 16*(5), 49-60.

- Hagerman, I., Rasmanis, G., Blomkvist, V., Ulrich, R. S., Eriksen, C. A., & Theorell, T. (2005). Influence of coronary intensive care acoustics on the quality of care and physiological states of patients. *International Journal of Cardiology*, *98*, 267-270.
- Harris, P. B., & Sachau, D. (2005). Is cleanliness next to godliness? The role of housekeeping in impression formation. *Environment and Behavior*, *37*, 81-101.
- Harris, P., McBride, G., Ross, C., & Curtis, L. (2002). A place to heal: environmental sources of satisfaction among hospital patients. *Journal of Applied Social Psychology*, *32*, 1276-1299.
- Kenny, D. A., & Judd, C. M. (1984). Estimating the nonlinear and interactive effects of latent variables. *Psychological Bulletin*, *96*, 201-210.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, Appraisal, and Coping*. New York: Springer.
- Leather, P., Beale, D., Santos, A., Watts, J., & Lee, L. (2003). Outcomes of environmental appraisal of different hospital waiting areas. *Environment and Behavior*, *35*(6), 842-869.
- MacCallum, R.C., & Austin, J.T. (2000). Applications of structural equation modeling in psychological research. *Annual Review of Psychology*, *51*, 201-226.
- Nasar, J. L. & Devlin, A. S. (2011). Impressions of Psychotherapists' Offices. *Journal of Counseling Psychology*, *58*(3), 310-320.
- Pilpel, D. (1996). Hospitalized Patients' Satisfaction with Caregivers' Conduct and Physical Surroundings. *Journal of General Internal Medicine*, *11*, 312-314.
- Raposo, M. L., Alves, M. A. & Duarte, P.A. (2009). Dimensions of service quality and satisfaction in healthcare: a patient's satisfaction index. *Service and Business*, *3*, 85-100.
- Rowlands, J., & Noble, S. (2008). How does the environment impact on the quality of life of advanced cancer patients? A qualitative study with implications for ward design. *Palliative Medicine*, *22*, 768-774.

- Schumacker, R. E., & Lomax, R. G. (1996). *A beginner's guide to structural equation modeling*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Swan, J., Richardson, L., & Hutton, J. (2003). Do appealing hospital rooms increase patient evaluations of physicians, nurses, and hospital services? *Health Care Management Review, 28*, 254-264.
- Taylor, S. E. (1983). Adjustment to threatening events: A theory of cognitive adaptation. *American Psychologist, 38*, 1161-1173.
- Taylor, S. E., Wood, J. V., & Lichtman, R. R. (1983). It could be worse: Selective evaluation as a response to victimization. *Journal of Social Issues, 39*, 19-40.
- Taylor, S. E., & Brown, J. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin, 103*, 193-210.
- Ulrich, R. S. (1984). View through a window may influence recovery from surgery. *Science, 224*, 420-421.
- Ulrich, R. S. (1991). Effects of interior design on wellness: Theory and recent scientific research. *Journal of Health Care Interior Design, 3*, 97-109.
- Ulrich, R. S., Zimring, C. M., Zhu, X., DuBose, J., Seo, H., Choi, Y., Quan, X., & Joseph, A. (2008). A review of the research literature on evidence-based healthcare design. *Health Environments Research and Design, 1*, 61-125.
- Weston, R., & Gore, P.A. (2006). A brief guide to structural equation modeling. *The Counseling Psychologist, 34*, 719-751.
- Winkel, G., Saegert, S., Evans, G. W. (2011). An Ecological Perspective on Theory, Methods, and Analysis in Environmental Psychology: Advances and Challenges. *Journal of Environmental Psychology, 29* (3), 318-328.
- Ziaei, H., Katibeh, M., Eskandari A., Mirzadeh, M., Rabbanikhah, Z., & Javadi, M. A. (2011). Determinants of patient satisfaction with ophthalmic services. *BMC Research Notes, 4*(7), 1-4.

4

Hospitals' Physical and Social Environments and Patients' Well-being - Disentangling the Effects

This chapter is based on the paper Andrade, C.C., Lima, M.L., Devlin, A.S., & Hernández, B. (under review). Hospitals' Physical and Social Environments and Patients' Well-being - Disentangling the Effects. *Environment and Behavior*.

1. Abstract

The hospital environment is an interpersonal context of caretaking that impacts patients' well-being. At the same time, evidence points to the role of the physical environment on patient health outcomes. However, the specific contribution of these environmental dimensions is not clear. Two experimental studies were conducted to understand the relative contribution of the physical and social environment to perceptions of patients' well-being. Study 1 investigated the inferences people make about the physical environment given information about the social environment, and vice versa. Study 2 sought to disentangle the independent effect of these two dimensions (physical and social) on expected well-being. Study 1 consisted of 6 conditions, in which 127 Portuguese participants were exposed to information about an inadequate, neutral, or good hospital physical environment; or about a negative, neutral, or positive hospital social environment. Study 2 had 194 participants, and a 3 x 3 experimental between-subjects design, in which the levels of quality of the physical and social environments were crossed. The main outcome measure was expected well-being. As predicted, both dimensions have a specific significant effect on expected well-being. In particular, the physical environment seems unable to improve satisfaction when its quality is high, but to reduce satisfaction when its quality is low. These studies show that the quality of hospitals' physical and social environments, and the perceptions of patients' corresponding well-being, are associated in people's minds.

Keywords: hospital, care delivery, physical and social environments, well-being

2. Introduction

Patients value, need, and expect high-quality care. Increasingly, research indicates that positive relationships with healthcare providers and a good physical environment play a significant role in patients' well-being. But how much do a supportive and appealing setting ("place") and friendly and warm professionals ("people") matter? Identifying the unique role of the physical environment is useful for planners because the physical environment can be modified to create a positive hospital image (Leather et al., 2003), but correlational studies cannot disentangle the unique effect of the physical and social forces. In this paper, two experimental studies examined the unique role of each of these dimensions.

Hospitals' physical and social environments: Why do they matter?

The importance of the interaction between patients and healthcare professionals for effective health care is widely acknowledged. This interaction is the main predictor of patients' satisfaction with care (e.g., Harris et al., 2002) and has a direct influence on many other relevant health outcomes (e.g., Guldvog, 1999). Patients satisfied with their interactions with providers tend to follow medical regimens (e.g., Jin et al., 2008), and are likely to return to that medical service (e.g., Marquis et al., 1983); thus, treatment is likely to be more efficient and recovery more rapid. Patient dissatisfaction not only fosters health risks by leading patients to avoid using future services, but also poses costly and time-consuming dilemmas for the health care agencies themselves (Taylor, 2011).

One of the earliest judgments that most patients make in a medical encounter concerns the practitioner's technical competence. However, most people know too little about medicine and standards of practice to know if they have been treated competently or not; instead they evaluate care using the information they have, namely, whether the practitioner is warm, friendly, and communicative (Taylor et al., 2006). On the other hand, research has demonstrated that the way we perceive and evaluate other people is influenced by the surrounding physical environment (e.g., Harris & Sachau, 2005). More than 50 years ago, Maslow and Mintz (1956) examined the effect of room decoration on judgments of the well-being and energy of the people depicted in

photographs. People were rated significantly higher in terms of energy and well-being when the judgments were made in a beautiful than in an unattractive room.

Are health professionals with the same behavior differently evaluated if the characteristics of the setting change? Evidence for this relationship has been emerging from correlational and experimental studies in Environmental Psychology. For example, patients recovering in appealing rooms rated their attending physician more favorably than did patients in typical rooms in the same hospital (Swan et al., 2003); and patients recovering in rooms with good acoustics considered the staff attitude to be better than did patients treated in rooms with poor acoustics (Hagerman et al., 2005). In hospital care units with better physical conditions, patients not only more positively perceive the quality of the physical environment, but also the quality of the social and organizational relationships (e.g., Andrade et al., 2012; Fornara et al., 2006). Using photographs of health care facilities, more attractive waiting areas (Arneill & Devlin, 2002) and more modern facilities (Devlin, 2008) were associated with higher perceived quality of care. In sum, research suggests the health care physical environment may influence patients' satisfaction and other clinical outcomes by affecting perceptions of interactions with health care providers.

Another research focus has been which factors explain patients' satisfaction. Perceptions of medical care and staff interactions are typically the top factors, but perceptions of facility quality also tend to emerge as a weaker but significant source of satisfaction (e.g., Harris et al., 2002; Raposo et al., 2008; Rowlands & Noble, 2008). Results indicate that both perceptions of the physical environment and perceptions of the interactions with staff affect patients' satisfaction, but the independent effects of each factor have not been determined.

Some research suggests that the healthcare physical environment may be more capable of producing reactions of dissatisfaction than satisfaction (e.g., Arneill & Devlin, 2002; Devlin, 1995). The idea that the physical environment has an effect especially when it is inadequate is consistent with Herzberg's theory (Herzberg, 1987): environmental factors, as context factors, can at best create no dissatisfaction when they are present, or create dissatisfaction if they are inadequate or absent.

Most of the research on patients' satisfaction is correlational; for that reason there are some limitations that prevent more definitive conclusions about the role of the quality of hospitals' physical and social environments: a) the reverse effect from satisfaction to perceptions of physical and social environments is not excluded; b)

patients are exposed to both stimuli at the same time (social and physical); thus the independent effect of each stimulus cannot be disentangled (the specific influence of the physical environment may be spurious); c) the precise level of the quality of the physical and social environments is not under control (especially the level of the social environment); and d) study samples are usually those of convenience; thus extraneous variables can explain part of the variance of users' satisfaction. As a result, research to determine the relative importance of the quality of hospitals' physical and social environments to patients' satisfaction is needed. Additionally, whereas expected well-being and perceptions of hospital staff can be inferred through the quality of the physical environment, researchers have not yet examined how perceptions of staff in turn lead patients to infer the quality of the health care physical environment and well-being.

Two laboratory studies were designed to address these issues by varying the levels of quality of the physical and social environments. Study 1 sought to describe and compare the inferences people make about the quality of the hospital environment and expected well-being based on partial information (only about the physical or only about the social environment). It was hypothesized that: a) the effect of information about the healthcare social environment on inferences about the quality of the physical environment would be stronger than the effect of information about the healthcare physical environment on inferences about the quality of the social environment, and b) the effect of information about the healthcare social environment on inferences on expected well-being would be stronger than the effect of the information about the physical environment. The objective of Study 2 was to disentangle the contribution of the quality of physical and social environments on well-being. It was hypothesized that: a) healthcare physical and social environments have an independent effect on well-being (e.g., Harris et al., 2002), b) the effect of the healthcare social environment on well-being would be stronger than the effect of the physical environment (e.g., Harris et al., 2002), and c) the effect of the healthcare physical environment on well-being would be stronger when the physical environment is inadequate than when it is adequate (e.g. Devlin, 1995).

3. Study 1

Method

Definitions

The social environment was defined as patient-provider interactions and broader aspects of the organization of the health care unit; and the physical environment as the ambient, architectural, or interior design features of its setting. To define well-being during the hospital visit we incorporated the construct of personal subjective well-being developed by the positive psychology theorists (e.g., Diener, 1984). Subjective well-being has two broad components: one cognitive, the other affective. The affective component has to do with the presence of positive emotions and the absence of negative emotions; the cognitive component is referred to as life satisfaction – a conscious cognitive judgment of one's life in which the criteria for judgment are up to the person. Accordingly, one can describe well-being in the hospital setting as a state characterized by the presence of positive emotions (although not necessarily the absence of negative ones) and by satisfaction with the health care service.

Participants, and design

One hundred and twenty-seven persons (79 women; mean age 28.45 years) participated in this study on a voluntary basis. Participants were obtained from the subject pool of students at the Lisbon University Institute (students from Psychology, Sociology, and Social Services), were students that volunteered in response to a poster or an email asking for participation, or were recruited in different secondary schools (teachers, staff, parents) or adult learning centers. These participants were randomly assigned to one of six possible conditions: good, neutral, or inadequate hospital physical environment; or positive, neutral, or negative hospital social environment (18 to 23 participants per condition). Due to the diversity of ages in the sample (min=18, max=59), the effect of age was controlled.

Manipulation of the independent variables

Manipulation of the perception of quality of physical environment. The quality of the physical environment was manipulated by presenting 35 photographs of an inadequate, neutral or good hospital outpatient area (see Figure 4.1, and Appendix E).



Figure 4.1 Photographs of the hospital areas used in the studies. The three hospital areas are, from top to bottom: inadequate, neutral, and good.

The inadequate and neutral hospital areas were selected based on the evaluations made in loco by architects and users (cf. Andrade et al., 2012), and the good hospital area belonged to a private and modern hospital. The photographs were taken by the researcher in periods when the service was not open to the public. For the purpose of the study, the photographs were ordered in a way that reflected what patients would encounter as they enter the service until they leave, following the appointment (i.e., general view of the waiting room, reception desk, seats in the waiting area, entrance to the medical offices area, corridor of the offices area, door of the doctor's office, door of the treatment office, exit).

To examine the effectiveness of the manipulation of the physical environment, the photographs were pre-tested through an online pilot study (see Appendix G). As expected, the hospital area with the good physical environment was judged as having higher quality ($M=2.87$, $SD=0.48$, $n=21$; on a scale where 0= absence of quality, and 4=maximum quality) than was the hospital area with the neutral physical environment ($M=2.37$, $SD=0.44$, $n=21$); the latter was judged as having higher quality than was the inadequate physical environment ($M=1.24$, $SD=0.42$, $n=26$; $F(2,65)=84.361$, $p<.001$, $\eta_p^2=.72$). This evaluation was done through PHEQIs, a measure described in the following section.

Manipulation of the perception of quality of the social environment. The quality of the social environment was manipulated through a story about a positive, a neutral, or a negative healthcare experience (see Appendix F). Stories were developed on the basis of definitions of the dimensions of the quality of the social-functional environment by Fornara et al. (2006). The three stories referred to the same sequence of events beginning as the patient arrives at an orthopedic care unit and continuing until he/she leaves (i.e., arriving, going to the reception desk, spending time in the waiting room, having the consultation, making an appointment for physiotherapy, and leaving). However, in the positive story events were qualified positively in terms of the social-functional environment (e.g., few people in the room, receptionist cordially greets the patient and offers the patient something to drink while (s)he waits for a few moments; a staff member greets the patient and accompanies her/him to the doctor's office; the first session of physiotherapy is scheduled for the next day). In the negative story, events were qualified negatively (e.g., many people in the waiting room, receptionist does not greet the patient, and tells the patient just to wait; a staff member points out the office down the hall, without greeting the patient; without eye contact, the doctor types on the computer while the patient talks; the patient must return to the clinic in order to schedule physiotherapy sessions). The neutral story only describes the steps the patient experiences during the healthcare visit without qualifying them. A visit to an orthopedic service was described because it is usually associated with acute but non-life threatening health problems. Two versions of all the stories were audio recorded. The two versions only differed in terms of the sex of the hypothetical patient protagonist of the story. Offering two versions was done to facilitate the participant's identification with the story. To reduce the influence of previous healthcare experiences, we chose not to ask participants to personally imagine themselves in the healthcare situation.

To examine the effectiveness of the manipulation of the social environment, the stories were pre-tested (see Appendix H). Sixty-four university students participated in an online pilot study. Through PHEQIs (Perceived Hospital Environmental Quality Indicators; Andrade et al., 2012), and as predicted, the positive story was judged as reflecting more social quality ($M=3.46$, $SD=0.58$, $n=22$; on a scale where 0= absence of quality, and 4=maximum quality) than was the neutral story ($M=2.25$, $SD=0.59$, $n=22$). The latter was judged as reflecting more social quality than was the negative story ($M=1.02$, $SD=0.47$, $n=20$). All p 's are significant ($F(2,61)=107.466$, $p<.001$, $\eta_p^2=.78$).

Dependent variables.

Quality perception of the physical environment was assessed by the Care Unit & In-/Out-patient Area scale; *quality perception of the social environment* was assessed by the Social-Functional Features scale, both from PHEQIs. Items are defined as sentences that express environmental evaluations (e.g., “*In this outpatient area the quality of furnishings is good*”), and responses are made on 5-point *Likert*-type ratingscales (from 0 “*totally disagree*” to 4 “*totally agree*”). In the actual experiment answers were given on a scale ranging from 1 “*totally disagree*” to 5 “*totally agree*” to facilitate the use of keyboard responses, then variables were recoded to the original range. Each scale contains positive (i.e., indicating the presence of quality) and negative (i.e., indicating the absence of quality) items, to control for response set.

The scale on Care Unit & In-/Out-patient Area has four factors of environmental quality perception: Spatial-physical comfort (6 items), Orientation (4 items), Quietness (2 items), and Views and lighting (3 items); the scale on Social-functional features has two factors: Care for social and organizational relationships (6 items), and Privacy (3 items). Responses to the 15 items used to assess perceived quality of the physical environment (Cronbach's $\alpha=.95$), and responses to the 9 items used to assess perceived quality of the social environment (Cronbach's $\alpha=.94$) were scaled with higher numbers reflecting higher perceived quality.

Expected well-being was measured using two indicators: satisfaction and affective state. *Satisfaction with the care unit* was measured through the following four questions (Raposo et al., 2008): “Considering the global experience of [female/male name of the target patient in the story] in this care unit, in general, how satisfied is she/he?”; “To what extent does this care unit meet her/his expectations?”; “To what extent does this care unit meet her/his needs?”; and “Now imagine an Orthopedic care

unit perfect in all its aspects. How far from perfection does [female/male name of the target patient] think this care unit is?”. Responses to these items were recorded on a 9-point bipolar scale ranging, respectively, from (1) “very unsatisfied” to (9) “very satisfied”; from (1) “not at all” to (9) “totally”; from (1) “not at all” to (9) “totally”; and from (1) “very distant” to (9) “very close.” *Affective state* was measured through a semantic differential introduced by the following question: “How does [female/male name of the target patient] feel at the moment?” (Garcia-Marques, 2004). Responses were made on 9-point bipolar scales featuring the following adjectives: sad-happy, bad-good, and negative-positive; the respondent had to choose an answer from each adjective pair. The middle point meant “neither one thing nor the other.”

Satisfaction with the care unit and affective state had a high and significant correlation ($r(127)=.88, p<.001$). Thus, the two variables were collapsed into one single dependent variable called Well-being, for which the Cronbach’s alpha value is .97.

Procedure

Participants were asked to complete an informed consent document and were informed that the experiment intended to examine “how people evaluate hospital services through different types of information.” They were told to imagine that a hypothetical person went to an orthopedic service for a consultation because of tendinitis in the right hand. Participants were asked to pay attention to the story about the hospital visit listened to through a headset, or to the photographs of the hospital service projected on the screen, and were informed that some questions would follow. Both stories and the sequence of photographs had a duration of 3 minutes and 20 seconds. After the stimulus presentation, questions were presented on the screen, one at a time, and participants were asked to answer using the keyboard’s numeric keys. At the end, they were debriefed and thanked (see Appendix I).

Results

Manipulation Check

Approximately half of the participants were only exposed to photographs of a hospital area. The inadequate hospital was perceived as having significantly less physical quality ($M=0.42, SD=0.31, n=23$) than was the neutral ($M=1.56, SD=0.58, n=22$; on a scale from 0 to 4). The latter was judged as having significantly less physical

quality than was the good physical environment ($M=2.97$, $SD=0.44$, $n=21$; $F(2,63)=174.28$, $p<.001$, $\eta_p^2=0.85$). All p 's $<.001$.

Regarding participants that were only exposed to a story, the negative story was perceived as reflecting significantly less social quality ($M=0.44$, $SD=0.46$, $n=22$) than was the neutral story ($M=2.39$, $SD=0.68$, $n=21$). The latter was judged as reflecting significantly less social quality than was the positive story ($M=3.19$, $SD=0.62$, $n=18$; $F(2,58)=117.30$, $p<.001$, $\eta_p^2=0.80$). All p 's $<.001$.

Inferences about the quality of the hospital environment

Having shown that both the physical and social environment manipulations worked as expected, our goal was to understand whether these manipulations led to congruent expectations about the other attribute of the hospital environment. Thus, a 2 (Type of information presented: physical or social) X 3 (Level of quality: negative (inadequate) vs. neutral vs. positive (good)) analysis of variance (ANOVA) with all factors varying between participants was performed. The dependent variable was the expected quality of the hospital in terms of the other dimension (i.e., expected physical environment for those who only received information about the social environment, and expected social environment for those who only received information about the physical environment).

Results showed a main effect of the level of quality of the information ($F(2,121)=110.70$, $p<.001$, $\eta_p^2=.65$). As expected, positive information resulted in significantly higher evaluations of the environment ($M=2.38$; $SD=0.56$) than did the neutral information ($M=1.68$; $SD=0.79$). The latter produced significantly higher evaluations of the environment than did the negative information ($M=0.81$; $SD=0.43$; all p 's $<.01$). A significant main effect of the type of information was also obtained ($F(1,121)=25.22$, $p<.001$, $\eta_p^2=.17$), meaning that, overall, being exposed to information about the social environment produced more positive inferences about the hospital environment ($M=1.79$, $SD=0.98$) than did being exposed to information about the physical environment ($M=1.39$, $SD=0.73$). As expected, there was also a significant interaction effect ($F(2,121)=23.82$, $p<.001$, $\eta_p^2=.28$), showing that these effects were stronger when the participants were exposed to the information about the hospital social information than when they received information about the physical environment (see Figure 4.2).

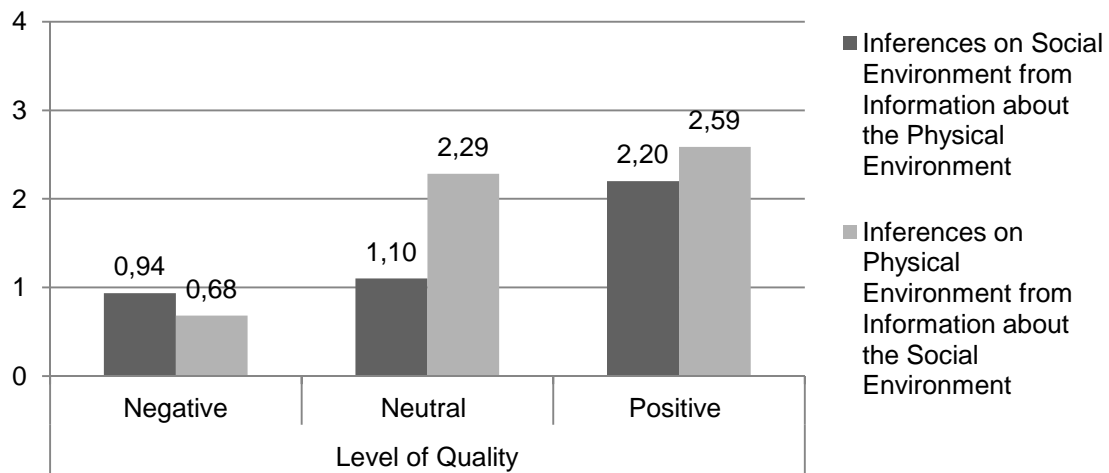


Figure 4.2 Inferences on the quality of the hospital physical or social environment based on information about the social or the physical environment, respectively.

Participants' age was found to be negatively and significantly correlated with perceptions of the hospital environment ($r(127)=-.42, p<.001$). Thus, the same analysis of variance was conducted, now controlling for the effect of age. Results showed that the effect of age was not significant, and the effects of level of quality, type of information, and interaction remained virtually the same.

Expected Well-being

The same ANOVA was repeated to analyze expected well-being when patients were exposed to information about the hospital physical or social environment. Results showed a significant main effect of the level of quality of the information ($F(2,121)=73.55, p<.001, \eta_p^2=.55$). As expected, positive information resulted in significantly higher expected well-being ($M=6.80; SD=1.73$) than did the neutral information ($M=5.59; SD=1.52$). The latter produced significantly higher expected well-being than did the negative information ($M=3.05; SD=1.85$; all p 's<.001). Moreover, a significant interaction between the effects of type of information and level of quality of the information was also obtained ($F(2,121)=19.86, p<.001, \eta_p^2=.25$), showing that, as predicted, the information about the social environment had a stronger effect on expected well-being than did the information about the physical environment. The main effect of the type of information was not significant ($F(1,121)=3.53, n.s., \eta_p^2=.03$) (see Figure 4.3).

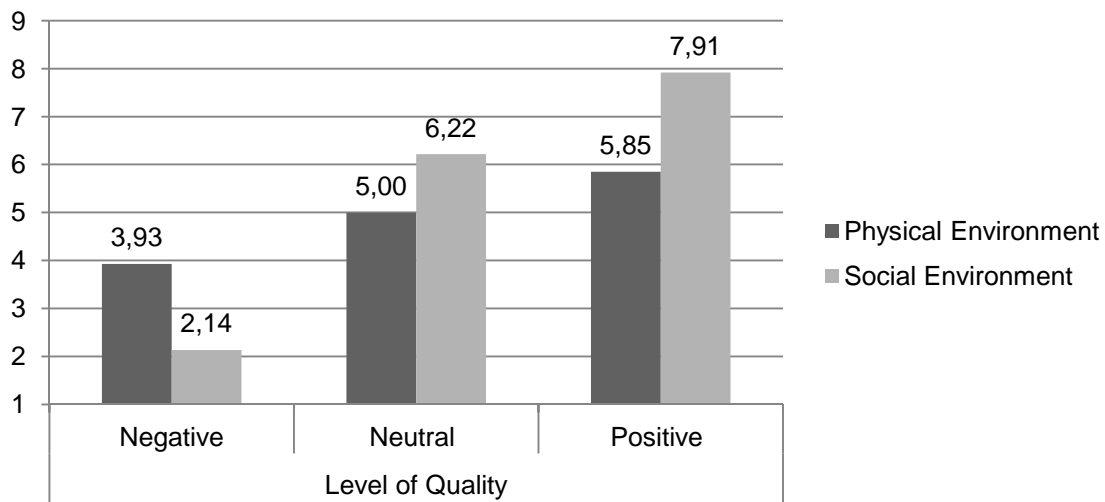


Figure 4.3 Level of expected well-being based on information about the hospital physical environment or hospital social environment.

Age and expected well-being were significantly and negatively correlated ($r(127)=-.38$, $p<.001$). Again, age was entered as a covariate but its effect was not significant; the results did not change.

4. Study 2

Method

Participants

One hundred and ninety-four persons (107 women; mean age 25.20 years) participated in this study; they were selected as were the participants of Study 1. Due to the diversity of ages in the sample (min=17, max=69), the effect of age was controlled in the analyses.

Design, independent variables, and dependent variables

The study had a 3 x 3 experimental between-subjects design, with two manipulated variables: quality of the physical environment (good vs. neutral vs. inadequate), and quality of the social environment (positive vs. neutral vs. negative). In sum, participants were randomly assigned to one of nine possible conditions in which they were exposed to photographs of a hospital outpatient area, and to a story of care

(18 to 24 participants per condition). Dependent variables were, as for Study 1: *Quality perception of the physical environment*; *Quality perception of the social environment*; and *Expected well-being*. Satisfaction with the care unit and Affective state again had a high and significant correlation ($r(194)=.86, p<.001$), and the Cronbach's alpha value for the composite variable *Expected well-being* was .97.

Procedure

The procedure was similar to Study 1. However, these participants were asked to pay attention to the story about the hospital visit, and to the photographs of the hospital service in which it took place, which were presented simultaneously. The presentation of the photographs and story were synchronized (see Appendix J).

Results

Manipulation Check

Regarding the quality of the healthcare physical environment, as expected, participants judged the hospital area with the good physical environment as having more quality ($M=2.93, SD=0.57, n=62$) than the hospital area with the neutral physical environment ($M=2.29, SD=0.90, n=64$). The latter was judged as having more quality than the hospital area with the inadequate physical environment ($M=1.17, SD=0.73; n=68; F(2,191)=92.92, p<.001$). All means were significantly different (all p 's<.001). In terms of the quality of the social environment, participants judged the positive story ($M=3.19; SD=0.62; n=62$) as reflecting more quality than the neutral story ($M=2.38; SD=0.82; n=66$). The latter was judged as revealing more quality than was the story of a negative healthcare experience ($M=0.53; SD=0.51, n=66; F(2,191)=269.90, p<.001$). All means were significantly different (all p 's<.001).

Expected well-being

The level of expected well-being was analyzed in a 3 (Quality of physical environment: good vs. neutral vs. inadequate) X 3 (Quality of social environment: positive vs. neutral vs. negative) analysis of variance (ANOVA) with all factors varying between participants.

As predicted, a main effect of the physical environment ($F(2,185)= 14.23, p<.001, \eta_p^2=.133$), and a main effect of the social environment ($F(2,185)=386.51, p<.001, \eta_p^2=.807$) were obtained. This outcome means that physical and social environments have an independent influence on expectations of well-being, which

supports the first hypothesis. Moreover, as predicted in the second hypothesis, the main effect of the quality of the social environment accounts for a higher proportion of variance in expected well-being than does the quality of the physical environment.

The inadequate physical environment ($M=4.78$; $SD=2.35$) produced significantly lower expected well-being than did the neutral ($M=5.62$; $SD=2.49$) and the good ($M=5.69$; $SD=2.31$) physical environments; p 's<.001), but the neutral and the good physical environments did not differ from one another. In other words, and using the neutral physical environment as a reference, results indicated that expected well-being was impaired by the inadequate physical environment, but was not improved by the good physical environment, in line with what was hypothesized. On the other hand, the positive social environment ($M=7.49$; $SD=1.15$) resulted in significantly higher evaluations of expected well-being than did the neutral social environment ($M=6.19$; $SD=1.19$). The latter produced significantly more expected well-being than did the negative social environment ($M=2.49$; $SD=1.10$; all p 's<.001); as the quality of social environment improves, expected well-being consistently increases (see Figure 4.4).

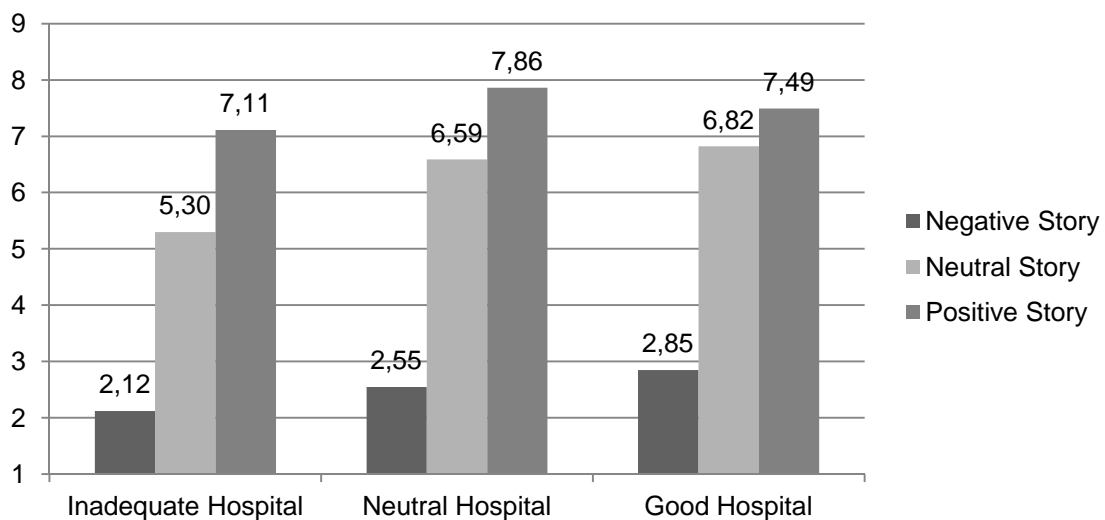


Figure 4.4 Level of expected well-being as a function of the quality of the hospital social and physical environments.

Results also showed that there is no significant interaction between the quality of the physical and social environments ($F(4,185)=2.17$, n.s., $\eta_p^2=.045$), and that the model explains 80.6% of the variance in expected well-being. Analyses were performed separately for satisfaction and affective state as dependent variables, and we found that results were virtually the same.

Participants' age was found to be negatively and significantly correlated with perceptions of quality of the physical environment ($r(194)=-.26, p<.001$), perceptions of quality of the social environment ($r(194)=-.29, p<.001$), and expected well-being ($r(194)=-.30, p<.001$). Thus, the same analysis of variance was conducted, now controlling for the effect of age. Results showed that the effect of age was not significant, and the effects of hospital, story, and interaction remained virtually the same.

5. General Discussion

The relationship with healthcare providers is a key aspect of the treatment, as research in Health Psychology has demonstrated (e.g., Jin et al., 2008). Positive interactions, good communication, and empathy with the providers promote emotional well-being (Rowlands & Noble, 2008) and satisfaction (Harris et al., 2002), which lead to more successful healthcare outcomes. A less studied aspect in terms of treatment success is the role of the healthcare physical environment where the care takes place (Bromley, 2012). The impact of the healthcare physical environment on well-being has emerged from studies in Environmental Psychology (e.g., Arneill & Devlin, 2002; Leather et al., 2003). The experimental laboratory studies presented in this paper were designed to overcome some of the limitations of correlational studies in which the effect of hospitals' physical and social environments on patients' well-being is hard to dissociate, and the mutual influence of these dimensions is difficult to examine. Thus, the first study examined how each of these dimensions alone affects inferences about the other, and how they produce inferences about well-being; the second study tested the relative effect of the social and physical environments on expected well-being.

With the aim of a separate assessment of impact, participants in Study 1 only received information about the quality of the hospital physical or social environment (good, neutral, or inadequate hospital area; positive, neutral, or negative story of care), and were asked to infer qualities of the other dimension, as well as about the level of expected well-being. Results clearly showed that these three dimensions are associated in people's minds. In particular, it was demonstrated that the physical environment communicates a message about the expectations one can have about the hospital staff and global social environment, and that the opposite is also true: the level of social environment encountered provides a promise of a corresponding level of quality of the

physical environment. Expected well-being also varies depending on the information provided about the quality of the social environment in isolation, or the physical environment in isolation, but the impact of the social information seems to be stronger.

We know from research in Social Cognition that prior expectations guide our judgments of new information (Taylor et al., 2006). When selecting or going to a new hospital, patients expect to find competent healthcare providers and a nice physical environment. Results showed that if people have information (from friends, family, or other sources) that a hospital has competent professionals, they may infer that the physical environment will be pleasant. The environments people occupy are rich with information about personalities, values, and attitudes (Smith & Mackie, 2007). Accordingly, hospital buildings concretize prevalent assumptions about patients, illness, care and healing environments, as well as medical providers' roles (Bromley, 2012), which are interpreted and internalized by users. If the quality of the hospital physical environment is poor, people may need to adjust their previous positive expectations to include this new negative information and create a coherent judgment of the health care providers and the quality of care in general. On the other hand, if people do not have information about the healthcare providers and they enter an appealing and supportive hospital facility, that encounter will establish expectations about the quality of the social environment that they will seek to confirm.

The second study used an experimental between-subjects design, in which one of three levels of quality of the physical environment (good, neutral, and inadequate hospital areas) and one of three levels of social environment (positive, neutral, and negative stories of care) were crossed yielding nine conditions. As predicted, both physical and social environments have a significant and independent contribution to expected well-being in a potential healthcare situation. Overall, well-being is enhanced as the quality of the physical and social environments increase. This result was reinforced by the results from Study 1, which showed that perceived well-being tends to vary in the expected direction even when only the physical or the social environment is manipulated. Thus, although the effect of the social environment is undoubtedly the stronger, corroborating previous research, the effect of the quality of the physical environment is not irrelevant or unimportant. The quality of the physical environment has a particular and cumulative presence in addition to the impact of the social environment. These results give stronger support to the accumulating evidence on the benefits of good healthcare physical design (Ulrich et al., 2008). In addition, the

absence of an interaction shows that, although the effect of the physical environment is much weaker than is the effect of the social environment, the effect of the physical environment tends to be constant whether the social environment is positive, neutral, or negative. That is, regardless of the level of quality of the interactions with staff and social-functional environment in general, the physical environment has an impact. Moreover, this study showed that expected well-being tends to increase when the physical environment improves from inadequate to neutral, and to become stable when the physical environment improves from neutral to good. In other words, although people notice there are differences between an inadequate, neutral, and better health care physical environment (as demonstrated by the manipulation checks), only an inadequate physical environment affects well-being negatively. This inability of the physical environment to improve satisfaction when the environment is better than “good enough” was predicted based on literature (e.g., Arneill & Devlin, 2002; Devlin, 1995; Herzberg, 1987). The results of this study challenge the idea that the effect of the physical environment on well-being is linear, by indicating that it probably reaches a ceiling effect, at least in a short visit to a hospital for a consultation. This statement is reminiscent of an assessment from Proshansky, Fabian, and Kaminoff (1983, p. 75): “it is, generally speaking, only when a physical setting becomes dysfunctional that a person becomes aware of his or her expectations for that setting. What was routine and in the background suddenly becomes the 'figure' in the thinking of those using the setting.” This result needs further exploration, for example with inpatients in real settings.

Some conclusions can be drawn from this study. First, it is both the “place” and the “people” in the hospital that contribute to well-being, but “people” contribute to a much greater extent than does place. Patients in a healthcare service want to feel cared for; this need is unsurprising given that the hospital social environment constitutes a fundamental aspect of care. Secondly, this study gives further support to the smaller but still significant and independent influence of the physical environment on well-being. Beyond the fact that the quality of the health care physical environment enables people to infer the quality of the social environment of an unknown care unit, an inadequate physical environment has a significant and consistent negative impact on well-being. In particular, the physical environment does not cause well-being enhancement (when it is good), but causes well-being reduction (when it is inadequate). Therefore, this study suggests that health care units should have providers that are technically competent, emphatic, and effective communicators, but also guarantee that the physical context

does not frustrate patients' expectations of what is perceived to be a minimum standard. On the other hand, an extremely attractive physical environment does not seem to make a significant difference, at least on the basis of this research.

In a time when patients are more knowledgeable, and increasingly adopt consumer attitudes toward their health care, their expectations about quality may also grow. No longer is the physician's authority accepted without question or complaint (Taylor, 2011). The manner in which care is delivered is under patients' closer scrutiny, which plays a significant role in their levels of satisfaction. For this reason, hospital environments as a whole should reflect the needs and expectations of users.

Although college students constituted part of our samples, and they have relatively little hospital experience, age, once it was controlled, did not affect our results. However, in future studies hospital experience should be controlled and tested as a potential moderator.

The present studies have some limitations. First of all, participants were not patients, which reduces ecological validity. Being ill produces physiological and psychological conditions that may have an important impact on patients' needs and perceptions. Secondly, participants were exposed to the visual image of a health care service, but obviously the physical environment involves other kinds of sensory experiences, such as what patients smell and hear. Likewise, they were exposed to a story, but in real settings the patient-provider communication is dynamic and bidirectional. Another limitation is that both independent variables – quality of the physical and social environment – had only three levels. In real life the range is much more complex: hospitals' physical and social environments are likely to have a wider range on both the positive and negative dimensions.

Despite these limitations, most of them directly related to the internal validity of experimental research, these studies provide answers to important questions not yet addressed in the literature and that field studies would be unable to answer. For example, the current approach reduces the problem of social desirability often raised in studies with real patients. The clear and useful results found here need further exploration in future studies, including in real health care contexts.

6. References

- Andaleeb, S. S., Siddiqui, N., & Khandakar, S. (2007). Patient satisfaction with health services in Bangladesh. *Health Policy and Planning*, 22(4), 263–73. doi:10.1093/heapol/czm017
- Andrade, C., Lima, M. L., Fornara, F., & Bonaiuto, M. (2012). Users' views of hospital environmental quality: Validation of the Perceived Hospital Environment Quality Indicators (PHEQIs). *Journal of Environmental Psychology*, 32(2), 97–111. doi:10.1016/j.jenvp.2011.12.001
- Arneill, A. B., & Devlin, A. S. (2002). Perceived quality of care: the influence of the waiting room environment. *Journal of Environmental Psychology*, 22(4), 345–360. doi:10.1006/jev.2002.0274
- Baillie, L. (2009). Patient dignity in an acute hospital setting: a case study. *International Journal of Nursing Studies*, 46(1), 23–36. doi:10.1016/j.ijnurstu.2008.08.003
- Bartlett, E. E., Grayson, M., Barker, R., Levine, D. M., Golden, A., & Libber, S. (1984). The effects of physician communications skills on patient satisfaction; recall, and adherence. *Journal of Chronic Diseases*, 37(9-10), 755–64.
- Becker, F. D., & Douglass, S. (2008). The ecology of the patient visit: physical attractiveness, waiting times, and perceived quality of care. *The Journal of Ambulatory Care Management*, 31(2), 128–41. doi:10.1097/01.JAC.0000314703.34795.44
- Becker, F. D., Gield, B., Gaylin, K., & Sayer, S. (1983). Office design in a community college: Effect on Work and Communication Patterns. *Environment and Behavior*, 6.
- Becker, F. D., & Poe, D. B. (1980). The effects of user-generated design modifications in a general hospital. *Journal of Nonverbal Behavior*, 4(4), 195–218. doi:10.1007/BF00986197
- Becker, F. D., Sweeney, B., & Parsons, K. (2008). Ambulatory facility design and patients' perceptions of healthcare quality. *Health Environments Research &*

Design Journal, 1(4), 35–54.

- Bitner, M. (1990). Evaluating Service Encounters: The Effects of Physical Surrounding and Employee Responses. *The Journal of Marketing*, 54(2).
- Bonaiuto, M., Fornara, F., & Bonnes, M. (2003). Indexes of perceived residential environment quality and neighbourhood attachment in urban environments: a confirmation study on the city of Rome. *Landscape and Urban Planning*, 65(1-2), 41–52. doi:10.1016/S0169-2046(02)00236-0
- Cho, W. H., Lee, H., Kim, C., Lee, S., & Choi, K.-S. (2004). The impact of visit frequency on the relationship between service quality and outpatient satisfaction: a South Korean study. *Health services research*, 39(1), 13–33. doi:10.1111/j.1475-6773.2004.00213.x
- Cvengros, J. a, Christensen, A. J., Cunningham, C., Hillis, S. L., & Kaboli, P. J. (2009). Patient preference for and reports of provider behavior: impact of symmetry on patient outcomes. *Health Psychology*, 28(6), 660–7. doi:10.1037/a0016087
- Devlin, A. S. (1995). Staff, patients, and visitors: Responses to hospital unit enhancements. *Environmental Design Research Association*, 113–117.
- Devlin, A. S. (2008). Judging a book by Its cover: Medical building facades and judgments of care. *Environment and Behavior*, 40(3), 307–329. doi:10.1177/0013916507302242
- Devlin, A. S., & Arneill, A. B. (2003). Health Care Environments and Patient Outcomes: A Review of the Literature. *Environment and Behavior* (Vol. 35, pp. 665–694). doi:10.1177/0013916503255102
- Devlin, A. S., Donovan, S., Nicolov, A., Nold, O., Packard, A., & Zandan, G. (2009). “Impressive?” Credentials, family photographs, and the perception of therapist qualities. *Journal of Environmental Psychology*, 29(4), 503–512. doi:10.1016/j.jenvp.2009.08.008
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, 95(3), 542–575. doi:10.1037//0033-2909.95.3.542

- Dijkstra, K., Pieterse, M., & Pruyn, A. (2008a). Stress-reducing effects of indoor plants in the built healthcare environment: the mediating role of perceived attractiveness. *Preventive medicine, 47*(3), 279–83. doi:10.1016/j.ypmed.2008.01.013
- Dijkstra, K., Pieterse, M., & Pruyn, A. (2008b). Individual differences in reactions towards color in simulated healthcare environments: The role of stimulus screening ability. *Journal of Environmental Psychology, 28*(3), 268–277. doi:10.1016/j.jenvp.2008.02.007
- Ebrecht, M., Hextall, J., Kirtley, L.-G., Taylor, A., Dyson, M., & Weinman, J. (2004). Perceived stress and cortisol levels predict speed of wound healing in healthy male adults. *Psychoneuroendocrinology, 29*(6), 798–809. doi:10.1016/S0306-4530(03)00144-6
- Engel, G. L. (1977). The Need for a New Medical Model: A Challenge for Biomedicine. *Science, 196*(4286), 129–136.
- Engel, G. L. (1980). The Clinical Application of the Biopsychosocial Model. *American Journal of Psychiatry, 137*(5), 535.
- Evans, G. W., & McCoy, J. M. (1998). When buildings don't work: the role of architecture in human health. *Journal of Environmental Psychology, 18*(1), 85–94.
- Fornara, F., Bonaiuto, M., & Bonnes, M. (2006). Perceived hospital environment quality indicators: A study of orthopaedic units. *Journal of Environmental Psychology, 26*(4), 321–334. doi:10.1016/j.jenvp.2006.07.003
- Gesler, W., Bell, M., Curtis, S., Hubbard, P., & Francis, S. (2004). Therapy by design: evaluating the UK hospital building program. *Health & Place, 10*(2), 117–28. doi:10.1016/S1353-8292(03)00052-2
- Gosling, S. D., Ko, S. J., Mannarelli, T., & Morris, M. E. (2002). A room with a cue: Personality judgments based on offices and bedrooms. *Journal of Personality and Social Psychology, 82*(3), 379–398. doi:10.1037//0022-3514.82.3.379
- Gotlieb, J. B. (2000). Understanding the effects of nurses, patients' hospital rooms, and patients' perception of control on the perceived quality of a hospital. *Health*

marketing quarterly, 18(1-2), 1–14. doi:10.1300/J026v18n01_01

- Gotlieb, J. B. (2002). Understanding the effects of nurses on the process by which patients develop hospital satisfaction. *Holistic Nursing Practice*, 16(5), 49–60.
- Grosenick, J., & Hatmaker, C. (2000). Perceptions of the importance of physical setting in substance abuse treatment. *Journal of Substance Abuse Treatment*, 18, 29–39.
- Guldvog, B. (1999). Can patient satisfaction improve health among patients with angina pectoris? *International Journal for Quality in Health Care*, 11(3), 233–40.
- Hagerman, I., Rasmanis, G., Blomkvist, V., Ulrich, R. S., Eriksen, C. A., & Theorell, T. (2005). Influence of intensive coronary care acoustics on the quality of care and physiological state of patients. *International Journal of Cardiology*, 98(2), 267–70. doi:10.1016/j.ijcard.2003.11.006
- Harmsen, J. a M., Bernsen, R. M. D., Bruijnzeels, M. a, & Meeuwesen, L. (2008). Patients' evaluation of quality of care in general practice: what are the cultural and linguistic barriers? *Patient education and counseling*, 72(1), 155–62. doi:10.1016/j.pec.2008.03.018
- Harris, P. B., McBride, G., Ross, C., & Curtis, L. (2002). A Place to heal: Environmental sources of satisfaction among hospital patients. *Journal of Applied Social Psychology*, 32(6), 1276–1299. doi:10.1111/j.1559-1816.2002.tb01436.x
- Harris, P. B., & Sachau, D. (2005). Is cleanliness next to godliness?: The role of housekeeping in impression formation. *Environment and Behavior*, 37(1), 81–101. doi:10.1177/0013916504266803
- Haskard, K. B., Williams, S. L., DiMatteo, M. R., Rosenthal, R., White, M. K., & Goldstein, M. G. (2008). Physician and patient communication training in primary care: effects on participation and satisfaction. *Health Psychology*, 27(5), 513–22. doi:10.1037/0278-6133.27.5.513
- Hekkert, K. D., Cihangir, S., Kleefstra, S. M., Van den Berg, B., & Kool, R. B. (2009). Patient satisfaction revisited: a multilevel approach. *Social science & medicine (1982)*, 69(1), 68–75. doi:10.1016/j.socscimed.2009.04.016

- Henderson, A., Van Eps, M. A., Pearson, K., James, C., Henderson, P., & Osborne, Y. (2009). Maintenance of patients' dignity during hospitalization: comparison of staff-patient observations and patient feedback through interviews. *International journal of nursing practice*, 15(4), 227–30. doi:10.1111/j.1440-172X.2009.01764.x
- Herzberg, F. (1987). One more time: How do you motivate your employees? *Harvard Business Review*, (September-October), 5–16.
- Horelli, L. (2006). Environmental human-friendliness as a contextual determinant for quality of life. *Revue Européenne de Psychologie Appliquée/European Review of Applied Psychology*, 56(1), 15–22. doi:10.1016/j.erap.2005.02.012
- Irurita, V. F. (1999). Factors affecting the quality of nursing care: the patient's perspective. *International journal of nursing practice*, 5, 86–94.
- Ittelson, W. H., Proshansky, H. M., & Rivlin, L. G. (1970). Bedroom Size and Social Interaction of the Psychiatric Ward. *Environment and Behavior*, 2(3), 255–270.
- Jin, J., Sklar, G., Oh, V., & Li, S. (2008). Factors affecting therapeutic compliance: A review from the patient's perspective. *Therapeutics and Clinical Risk Management*, 4(1), 269–286.
- Joffe, S., Manocchia, M., Weeks, J. C., Cleary, P. D., Manocchia, N., & Geary, P. D. (2003). What do patients value in their hospital care? An empirical perspective on autonomy centred bioethics. *Journal of Medical Ethics*, 29(2), 103–108.
- Keep, P., James, J., & Inman, M. (1980). Windows in the intensive therapy unit. *Anaesthesia*, 35(3), 257–62.
- Kvåle, K., & Bondevik, M. (2008). What is important for patient centred care? A qualitative study about the perceptions of patients with cancer. *Scandinavian Journal of Caring ...*, 22, 582–589. doi:10.1111/j.1471-6712.2007.00579.x
- Leather, P., Beale, D., Santos, A., Watts, J., & Lee, L. (2003). Outcomes of environmental appraisal of different hospital waiting areas. *Environment and Behavior*, 35(6), 842–869. doi:10.1177/0013916503254777

- MacLeod, C., Mathews, a, & Tata, P. (1986). Attentional bias in emotional disorders. *Journal of abnormal psychology, 95*(1), 15–20.
- Marquis, M. S., Davies, A. R., & Ware, J. E. (1983). Patient satisfaction and change in medical care provider: A longitudinal study. *Medical Care, 21*(8), 821–829.
- Marucha, P., Janice, K., & Favagehi, M. (1998). Mucosal wound healing is impaired by examination stress. *Psychosomatic Medicine, 60*, 362–365.
- Maslow, A. H., & Mintz, N. L. (1956). Effects of esthetic surroundings: Initial effects of three esthetic conditions upon perceiving “energy” and “well-being” in faces. *Journal of Psychology, 41*, 247–254.
- Matiti, M. R., & Trorey, G. M. (2008). Patients’ expectations of the maintenance of their dignity. *Journal of clinical nursing, 17*(20), 2709–17. doi:10.1111/j.1365-2702.2008.02365.x
- Mowen, J. C., Licata, J. W., & McPhail, J. (1993). Waiting in the emergency room: how to improve patient satisfaction. *Journal of health care marketing, 13*(2), 26–33.
- Mpinga, E. K., & Chastonay, P. (2011). Satisfaction of patients: a right to health indicator? *Health policy (Amsterdam, Netherlands), 100*(2-3), 144–50. doi:10.1016/j.healthpol.2010.11.001
- Munafò, M. R., & Stevenson, J. (2001). Anxiety and surgical recovery. Reinterpreting the literature. *Journal of Psychosomatic Research, 51*(4), 589–96.
- Nasar, J. L., & Devlin, A. S. (2011). Impressions of psychotherapists’ offices. *Journal of counseling psychology, 58*(3), 310–20. doi:10.1037/a0023887
- Nguyen Thi, P. L., Briançon, S., Empereur, F., & Guillemin, F. (2002). Factors determining inpatient satisfaction with care. *Social science & medicine (1982), 54*(4), 493–504.
- Oflaz, F., & Vural, H. (2010). The evaluation of nurses and nursing activities through the perceptions of inpatients. *International nursing review, 57*(2), 232–9. doi:10.1111/j.1466-7657.2009.00772.x

- Ong, L. M., De Haes, J. C., Hoos, a M., & Lammes, F. B. (1995). Doctor-patient communication: a review of the literature. *Social science & medicine (1982)*, 40(7), 903–18.
- Pol, E. (2007). Blueprints for a history of Environmental Psychology (II): From Architectural Psychology to the challenge of sustainability. *Medio Ambiente y Comportamiento Humano*, 8(1, 2), 1–28.
- Proshansky, H. M., Fabian, A. K., & Kaminoff, R. D. (1983). Place identity: physical world socialization of the self. *Journal of Environmental Psychology*, 3, 57–83.
- Raposo, M. L., Alves, H. M., & Duarte, P. A. (2008). Dimensions of service quality and satisfaction in healthcare: a patient's satisfaction index. *Service Business*, 3(1), 85–100. doi:10.1007/s11628-008-0055-1
- Rice, G., Ingram, J., & Mizan, J. (2008). Enhancing a primary care environment: a case study of effects on patients and staff in a single general practice. *The British journal of general practice: the journal of the Royal College of General Practitioners*, 58(552), 465–70. doi:10.3399/bjgp08X319422
- Rowlands, J., & Noble, S. (2008). How does the environment impact on the quality of life of advanced cancer patients? A qualitative study with implications for ward design. *Palliative Medicine*, 22(6), 768–74. doi:10.1177/0269216308093839
- Savage, R., & Armstrong, D. (1990). Effect of a general practitioner's consulting style on patients' satisfaction: a controlled study. *British Medical Journal*, 301(OCTOBER), 968–970.
- Shepley, M. M., Harris, D. D., & White, R. (2008). Open-Bay and Single-Family Room Neonatal Intensive Care Units: Caregiver Satisfaction and Stress. *Environment and Behavior*, 40(2), 249–268. doi:10.1177/0013916507311551
- Sitzia, J., & Wood, N. (1997). PATIENT SATISFACTION: A REVIEW OF ISSUES AND CONCEPTS. *Social science & medicine*, 45(12), 1829–1843.
- Sommer, R., & Ross, H. (1958). Social Interaction On a Geriatrics Ward. *International Journal of Social Psychiatry*, 4(2), 128–133. doi:10.1177/002076405800400207

- Sun, B. C., Adams, J., Orav, E. J., Rucker, D. W., Brennan, T. a, & Burstin, H. R. (2000). Determinants of patient satisfaction and willingness to return with emergency care. *Annals of emergency medicine*, 35(5), 426–34.
- Sundstrom, E., Bell, P. A., Busby, P. L., & Asmus, C. (1996). Environmental Psychology 1989 – 1994. *Annual review of psychology*, 47, 485–512.
- Swan, J. E., Richardson, L. D., & Hutton, J. D. (2003). Do appealing hospital rooms increase patient evaluations of physicians, nurses, and hospital services? *Health Care Management Review*, 28(3), 254–64.
- Ulrich, R. S. (1984). View Through Surgery Window May Influence Recovery from Surgery. *Science*, 224(4647), 420.
- Ulrich, R. S. (2002). Health Benefits of Gardens in Hospitals. *Plants for People*.
- Ulrich, R. S., Zimring, C., Barch, X. Z., Dubose, J., Seo, H.-B., Choi, Y.-S., Quan, X., et al. (2008). A review of the research literature on evidence-based healthcare design. *Health Environments Research and Design*, 1(3), 61–125.
- Uzzell, D., & Rätzzel, N. (2009). Transforming environmental psychology. *Journal of Environmental Psychology*, 29(3), 340–350. doi:10.1016/j.jenvp.2008.11.005
- Van Dulmen, a. M., & Bensing, J. M. (2002). Health promoting effects of the physician-patient encounter. *Psychology, Health & Medicine*, 7(3), 289–300. doi:10.1080/13548500220139421
- Webster, C., & Bryan, K. (2009). Older people’s views of dignity and how it can be promoted in a hospital environment. *Journal of clinical nursing*, 18(12), 1784–92. doi:10.1111/j.1365-2702.2008.02674.x
- Williams, B., Coyle, J., & Healy, D. (1998). The meaning of patient satisfaction: an explanation of high reported levels. *Social science & medicine* (1982), 47(9), 1351–9.
- Winkel, G., Saegert, S., & Evans, G. W. (2009). An ecological perspective on theory, methods, and analysis in environmental psychology: Advances and challenges. *Journal of Environmental Psychology*, 29(3), 318–328.

doi:10.1016/j.jenvp.2009.02.005

Wittenbrink, B., Judd, C., & Park, B. (2001). Spontaneous prejudice in context: Variability in automatically activated attitudes. *Journal of Personality and Social Psychology, 81*(5), 815–827.

5

GENERAL DISCUSSION

The main goal of the present research program was to contribute to a better understanding of the role of the healthcare physical environment on patients' well-being.

As illustrated in the first chapter, the study of the link between the presence of certain objective features, or the perceptions of the overall quality of the hospital physical environment, and patients' satisfaction and emotional well-being has received considerable attention over the past 40 years (for an extensive review, see Ulrich et al., 2008). However, the processes through, and the conditions when, this relationship occurs have been extensively neglected.

This thesis claims that the healthcare physical environment has an important *and unique* role on patients' experience during a hospital visit (or stay), and our aim was to support this view. More specifically, and succinctly, the present thesis aimed to answer two main research questions. First, *how does the – well-documented – relationship between the objective features of the healthcare physical environment and the patients' well-being occur? What are the psychological mediating processes involved?* There is a body of research linking the conditions of the physical environment and the patients' perceptions of (*not only*) the quality of the physical environment (e.g., Leather, Beale, Santos, Watts, & Lee, 2003), *but also* the perceptions of the quality of staff and social environment in general (e.g., Hagerman et al., 2005). Thus, we hypothesized that patients' perceptions of both physical and social healthcare environments would have mediating effects in that relationship (Study 2). In other words, we hypothesized that one of the explanations for patients tending to have higher levels of well-being in hospitals with better physical conditions is that patients recognize and appreciate the quality of those environments, as well as perceive staff more positively. Those perceptions, in turn, would contribute to enhance well-being. This first main objective was complemented by the test of a moderating variable, namely, patients' status. That is, considering that the nature of the experience of inpatients and outpatients in the hospital is inherently different, we tested if those mediating processes occurred in the same way for inpatients and outpatients, or not.

Our second main research question was *does the hospital physical environment have a unique contribution for patients' well-being, even when controlling for the effect of the quality of the social environment?* We expected to find a significant effect of the physical environment's quality, over and above the quality of the social environment, and, to test this hypothesis, we conducted an experimental laboratorial study (Study 4).

In addition, and given the past evidence showing that these dimensions are often associated, we also examined the inferences people make in terms of quality of care based on what they know *only* about the hospital physical environment or *only* about the social environment (Study 3). The first step of this research program was to adapt and validate a measure of hospital environmental quality perception (Study 1).

We believe that overall, the results we obtained support our hypotheses, and are likely to contribute to the understanding of the value of the physical environment in the healthcare setting. In the next section, we present a summary of the main findings and their potential implications.

1. Summary of the findings

We use (or we look at) a physical environment and we can tell if it is comfortable and appealing or not. From a place that is nicely decorated or not decorated at all, with comfortable sofas or hard chairs, with a lot of natural light or with closed or small and inaccessible windows, clean or unkempt, we create different impressions. This is also true for the healthcare settings where patients go to receive care and treatments.

Patients do not ignore the hospital physical environment and are able to differentiate between a “good” and a “bad” physical environment. Our studies corroborated this already established idea (e.g., Becker & Douglass, 2008; Leather et al., 2003; Swan, Richardson, & Hutton, 2003). Study 2 (as Study 1) showed that distinct orthopedic care units with different levels of objective environmental quality (as assessed by experts) were evaluated by patients as having significantly different levels of quality in terms of physical environment. Studies 3 and 4 also confirmed that only by looking at photographs people could judge the goodness of hospital areas, which also corroborates the findings of other studies (e.g., Arneill & Devlin, 2002; Devlin, 2008).

Why is that relevant? The physical environment has an impact on us, wherever we are, and, in general, that impact is positive if the physical environment is aesthetically appealing and supportive of the people’ needs. In particular, research has shown that it does matter for the well-being of hospital users, including patients. Studies in private clinics, inpatient and outpatient hospital care units have often related objective characteristics of the physical environment with several relevant patients’

outcomes, and the perception of the quality of the physical environment has been found to be a predictor of patients' satisfaction. Our Study 2 showed that in health care settings with higher quality in terms of physical conditions patients are more satisfied with their care, and Study 3 showed that expected well-being of likely patients (as measured by expected satisfaction with care, and expected affective state) varied according to the information about the quality of the physical environment. In sum, these results confirm that the quality of the healthcare physical environment is associated to patients' actual and expected well-being in a hospital visit. This might be explained by the fact that any physical structure, including hospitals, also contain symbolic content (Bailey, 2002). Aspects such as good quality materials, furniture and decorations may carry messages that transmit to patients a sense of importance, dignity, and esteem. Thus, the symbolism associated with a hospital must signify "hospitality" – welcome and warmth – rather than just "hospital".

The impact of a healthcare physical environment might be direct, and affect, for example, physiological outcomes (e.g., noise is related with heart rate levels; Hagerman et al., 2005). However, the effect of physical environment on patients' satisfaction and is not likely to be direct. These indirect effects have not been often explored, but Dijkstra, Pieterse, and Pruyn (2008) found that a hospital room with indoor plants resulted in less expected stress (than in the control condition), because it was perceived as more attractive. In study 2 we found that health care physical environment conditions affect satisfaction with care through the perceptions of environmental quality. That is, in health care settings with higher quality in terms of physical conditions, patients are more satisfied in part because their perceptions of the environment of the care unit are more positive. In particular, and built on previous findings, we hypothesized that physical environment conditions would not only influence patients' perceptions of the physical environment, but also perceptions of staff and social environment in general, thus affecting well-being. This hypothesis was confirmed.

However, although we had hypothesized that both perceptions of the physical and social environments would have mediating effects both for inpatients and outpatients (but likely with different intensities), the differences we found were even more firm. Study 2 showed that patients' status "totally" moderated the process linking objective environmental quality and satisfaction. On the one hand, objective environmental quality predicts the perceptions of the quality of both the physical and social environments, regardless of the patients' status. This result gives stronger support

to previous studies, with the advantage that our data was collected in eight different hospital areas, in different sites and with different staff. On the other hand, inpatients' satisfaction was found to be affected by the way they perceive relationships with staff and organization of the care unit (social environment), whereas outpatients' satisfaction was chiefly affected by how good they perceive the physical environment to be – which justifies the moderation we found.

The differences we found between inpatients and outpatients in terms of the involved mediating variables raise new research questions. We believe that these differences might be due to the priority needs of the patients, under these different circumstances. Inpatients are likely to be more vulnerable to stress, more in need of care, and more dependent from (all) healthcare providers (e.g., doctors, nurses, and other staff) even for basic tasks as eating or getting out of bed. As inpatients can accept from staff deviations to “ideal practice” (e.g., Baillie, 2009; Henderson et al., 2009), also their expectations regarding the physical environment, if not met, might be adjusted to lower levels, or – alternatively – considered “inappropriate”, as long as they feel they have the minimum attention, and empathy from staff. This might be one of the ways they find to cope with a stressful situation such is a hospitalization. On the other hand, outpatients might not have the need to adjust their expectations about “what is good care”. They often go to a consultation for routine, less complicated, or more bureaucratic issues. Doctors, and not all healthcare providers, are the professionals with whom they have more relevant interactions. Thus, the general social-functional environment of the care unit in terms of organization and privacy might not affect them as much as the social-functional environment of an inpatient care unit will affect inpatients. There might be two additional and related reasons for that: they (of course) spend less time in the care unit, and – if unsatisfied – they can (much) easily leave and go to another service (for example, to a private clinic). That is, outpatients have more control over the care experience they are going through. These are just some possible explanations that might mean to our moderation results. Therefore, we believe that the dynamics between in-/out-patients and hospital environment deserve further investigation, including taking into account other variables that may have the potential to mediate or moderate the relationship between the perceived quality of physical and social environments and satisfaction. In particular, the role of expectations, goals, needs, stress, and coping strategies may shed some light on this subject. Nevertheless the challenging questions raised by the patients' status moderator, our findings

corroborate that – either way – patients’ satisfaction can be enhanced by improving the hospital physical conditions.

First impressions of others are important and useful judgments, are rapid, effortless, and spontaneous, and begin with visible cues, such as those from the physical environment (Smith & Mackie, 2007). The results of our studies provide additional evidence for this idea. First, in Study 1 we found that users (e.g., patients, visitors, and staff) of the two newer hospitals (with better physical conditions) reported higher perceptions of the hospital social-functional environment than did the users of the two older hospitals. Then, as we already mentioned, Study 2 showed that the objective environmental quality of the hospital care units predicted the patients’ perception of the quality of social environments. Moreover, it was found that the correlation between perceived quality of the physical environment and the perceived quality of the social-functional environment was strong and significant ($r=.77, p<.001$). Although this data is correlational, it supports the idea that the perceptions of staff and overall social environment are congruent with the objective and subjective (perceived) quality of the physical environment. Moreover, Study 3 revealed that – for non-patients, not in a hospital – information about *only* the physical environment creates expectations about the quality of the hospital social environment. All together, our findings give further support the findings of previous research (e.g., Arneill & Devlin, 2002; Devlin, 2008): the quality of hospitals’ physical and social environments are associated in people’s minds. Something that was never tested before was the opposite relationship. As predicted, we found that information about *only* the social environment also creates expectations about the quality of the healthcare physical environment.

Our next step was to disentangle the effect of the quality of the social and physical environments, which was never examined in the literature. In particular, we intended to investigate if the physical environment had a unique contribution for well-being, over and above the effect of the quality of the social environment. This research question could hardly be tested in a field study because for practical and ethical reasons the social environment could not be manipulated. As hypothesized, we found that the quality of the physical environment has a significant and specific role on expected well-being. We did not find (or predicted) an interaction between the quality of physical and social environment. However, interestingly, we confirmed the hypothesis that the physical environment only affects well-being negatively, when it is inadequate; and that a very good physical environment, compared to a “neutral” physical environment, is

unable to improve satisfaction. In sum, we found that the quality of the physical environment has a significant and unique contribution for expected well-being that tends to be constant regardless of the quality of the social environment: although people notice there are differences between inadequate, neutral, and good healthcare physical environment, that only matters to patients' well-being (reducing it) when physical environment is perceived as above a minimum standard.

Nevertheless, there is an important aspect that can not be ignored. Study 4 only tell us something about the patients' "reported" well-being, but there is a variety of other relevant outcomes that can be influenced to a greater extent by the physical healthcare environment, and that may justify the creation of enhanced hospital' physical environments (e.g., pain, Malenbaum et al., 2008; physiological state, Hagerman et al., 2005; recovery time, Ulrich, 1984). For example, Becker and Douglass (2008) found a positive correlation between more attractive outpatient environments and reduction of patient anxiety (see also Leather et al., 2003). Some of the environmental features that can promote those stress-reducing effects have already been described. Namely, Dijkstra, Pieterse, and Pruyn (2008) found that perceived stress was lower and room attractiveness higher with a hospital room with plants.

In a way, Study 2 and Study 4 raised paradoxical or at least puzzling results for future studies to address. Whereas the field study told us that the social environment does not predict outpatients' well-being, the laboratorial study showed us that it has, and that it is much stronger than the effect of the physical environment. We believe that these results need further and deeper examination, namely in terms of what people expect as an "ideal care", and what people end up giving priority and importance in an actual hospital visit, depending on a number of relevant important variables such as those we have mentioned earlier.

Finally, let us discuss what we found regarding the PHEQIs – Perceived Hospital Environment Quality Indicators – measure, that we used across our studies. This instrument had been developed in Italy to assess the quality of hospital physical (external spaces, and in-/out-patient care unit areas) and social environments from the point of view of users (patients, visitors, and staff). Using a confirmatory factor analysis, and by shortening PHEQI scales, we replicated the scales' factorial structures in a Portuguese sample, and obtained acceptable fit indices. Moreover, results in terms of overall reliability, criterion validity, and construct validity were satisfactory. However, the reliability of PHEQIs will need further examination in more cultural

contexts so these scales can – hopefully – become a widely used, culture-general measures in the field. In particular we believe that two aspects need clarification: the conceptual dimensionality of some subscales, and the adequacy of the instrument for staff. For example, the “spatial-physical comfort” subscale from the Care unit & In-/Out-patient area scale needs some further investigation in terms of content validity because its original 19 items were reduced to 6. In the other hand, this same scale, as well as the Social-functional features scale, asks the respondents to assess the hospital environment that is designed for patients (e.g., waiting area), or to assess the environment from the point of view of the patients (e.g., “In this care unit doctors are generally not very understanding toward patients”). In the current version of PHEQIs staff members do not directly assess their own physical and social work environment (e.g., nursing station, restroom). Thus, future research should investigate the convenience of developing an additional PHEQIs scale where healthcare professionals can evaluate their own environment.

2. Revisiting our central research questions

The two central aims of the present thesis were to shed light on the psychological processes involved on the relationship between the hospital physical conditions and the patients’ well-being, and to identify the unique effect of the physical environment.

How does the relationship between the objective features of the healthcare physical environment and the patients’ well-being occur? The results from Study 2 supported the idea that the objective healthcare physical environment has a significant influence on patients’ well-being (as measured by satisfaction with care), and that this influence is mediated through what patients think about the quality of two main dimensions of care: the social, and the physical. It should be noted that Study 1 had already shown that there was an association between the objective physical environment of the hospital and patients’ perceptions of the physical and social environment.

Study 2 also revealed that the patients’ status seems to affect the experience of the hospital. The quality of the social environment is significantly important for inpatients (compared to the quality of the physical environment), and the quality of the social environment is significantly important for outpatients (compared to the quality of the social environment). In sum: the impact of physical environment on patients is not

(only) direct, but mediated through their cognitive assessments about the hospital environment; and the importance of those assessments depends on the patients' status.

There was a strong and significant correlation between perceived quality of the physical environment and the perceived quality of the social-functional environment. Moreover, the associations that people do between the quality of physical and social environments were also evident from the results of Study 3. Thus, we followed our second research question by conducting an experimental laboratorial study.

Does the hospital physical environment have a unique contribution for patients' well-being, even when controlling for the effect of the quality of the social environment? The answer to this question is positive. Results from Study 4 showed that the physical environment has a significant effect on expected well-being, regardless of, and over and above, the quality of the social environment. The effect of the physical environment appears to be constant in this way: physical environment do not add anything to well-being when it is of good quality, neither when the social environment is positive, nor when it is negative. On the other hand, when the physical environment is of bad quality, it invariably reduces well-being.

Our research also has limitations that should be addressed in the future. Each chapter raised some of those issues, but in the next section we will address again those regarding the two main research questions of this thesis. We will also focus on implications and future directions.

3. Limitations, implications, and future directions

We believe that the results obtained bring new insights, and have important implications for future research in healthcare environments, by opening new avenues for investigation. We also believe they are significant for hospital management and planning.

Our research confirmed that the physical environment has an undeniable unique role on patients' well-being. The results obtained in the field study, from testing a holistic mediation model predicting satisfaction, mean, overall, that if patients perceive that the physical and social environments are conceived to take well care of them, and as meeting their needs, they will be satisfied. Besides, results showed that the physical conditions of the hospital care unit contribute to convey that message. Thus, these

results reinforce the impact of the physical environment, and support the value of assessing patients' perceptions.

Competing with the most serious predictor of patients' well-being – the quality of the social environment – the power of the physical environment was experimentally demonstrated. The physical environment not only “tells” patients about what they can expect from the quality of care and social environment, but it also is able to affect well-being, over and above the quality of the social environment.

Although Study 4 showed that both physical and social environments have a specific contribution to patients' well-being, our field study revealed that there are differences among inpatients and outpatients regarding satisfaction' predictors: the social environment is what predicts inpatients' well-being, and the physical environment is what predicts outpatients' well-being. Thus, it seems that the “equation” for solving patients' satisfaction may be composed by different factors that, in a real situation, will be weighted depending on the circumstances. There might be differences between inpatients and outpatients experiences, and those variables deserve further research.

One of the variables that may be playing a role is stress. Unfortunately we did not use any measure of stress in our field study. However, it would be interesting to investigate if the moderating variable “patients' status” (inpatients vs. outpatients) is a proxy variable of stress.

It could be possible that stress and the eventual corresponding emotional coping strategies is the cause of patients reordering their needs, having consequences in terms of what they consider to matter to their satisfaction. In other words, could stress moderate the relationship between the hospital physical and social environment and patients' well-being? For example, it could it be that patients, under higher levels of stress, and highly depending on healthcare providers (probably most of the inpatients of our sample), focus exclusively on what is “really essential” to their recovery (the top of the pyramid in the hierarchy of needs, the social environment). Following this reasoning, at the other end of the continuum could be patients under no stress, less dependent from care, then able to focus on other dimensions (e.g., the physical environment).

Stress is related to attentional processes (e.g., Steptoe & Ayers, 2005). Thus, one can speculate that patients under more stress may exclude from their cognitive system “minor” stimuli so they can focus on more relevant information (e.g., MacLeod,

Mathews, & Tata, 1986). Also related to our supposition is the evidence that intense emotional episodes are related to a higher need of social sharing (e.g., Christophe & Rimé, 1997), which could be one of the reasons why patients under more stress privilege the hospital social dimension. These are a few ideas for future studies targeted at explaining the differences found between inpatients and outpatients.

Future studies could also use patients' stress as an outcome variable. Past studies (some of them reviewed in the first chapter of this thesis) have shown that a good physical environment is associated to stress reduction during a hospital visit (e.g., Leather et al., 2003). However, those studies were mostly conducted in outpatient clinics. Would a good physical environment contribute to reducing the overall level of stress of inpatients from the moment they arrive to the care unit until they leave? A useful strategy could be to disentangle the perceived stress related to the illness (and treatments) and the perceived environmental stress. That could help to understand if low levels of environmental stress (or a physical environment perceived as having high quality) would produce better outcomes regardless of the illness-related stress. A longitudinal design, for example with daily measures of stress, would be advantageous to better understand how patients cope with hospitalization during their stay. Also, to measure outcomes such as the number of recovery days, amount of medication, or short time prognosis (e.g., rehospitalization) would be important additional information of the consequences of the healthcare conditions (e.g., Ulrich, 1984). The relationship between patients' judgments of care (physical and social dimensions) and well-being, and "objective" indicators of recovery should deserve further investigation.

The quality of the social environment in our field study was not directly measured. However, perceptions of quality of social and physical environments were found to be highly correlated. If future studies could somehow get some "objective" indicators of the quality of the social environment, such as time healthcare providers spend with the patient, type of communication, privacy issues, one could have a better understanding of the reasons why this correlation occurs. As Study 3 confirmed, perceptions of physical and social environment are able to influence each other. However, part of this congruency could be also explained by the fact that friendlier staff tends to work in better physical environments and less friendly staff tends to work in worse physical environments. A question that should be addressed is the causal direction between a good physical environment and a good social environment. It is possible that empathic staff, concerned with the care they deliver, act more to improve

the physical conditions that their service provides to patients. Alternatively, it is also possible that better physical conditions inspire staff to give their best. A good working place might directly facilitate a better job, but also affect staff indirectly, by supporting their own health and well-being, by lifting their spirit, or increasing motivation. Studies that have shown an association between the physical environment and staff' job satisfaction, stress, or cooperation among staff members support this idea (e.g., Andrade, Hernández-Fernaud, & Lima, 2013; Becker & Poe, 1980; Shepley, Harris, & White, 2008). The underlying assumption is that a positive physical environment can cause staff satisfaction and stress reduction, which in turn positively affect their ability to respond to patients' needs. More research is needed to address this causal direction.

Our studies reveal that the way the physical environment affects patients is complex, and that it should be viewed as integrated in a broader picture. In short, we propose that future research on healthcare should consider the hospitalization as a process to which patients need to adapt, given the situation they are going through, the conditions they need to face, and the resources they have available. Social support, for example, might have a buffering effect to an unsupportive healthcare environment.

Patients' satisfaction is, by definition, dependent on expectations. On the other hand, expectations may be dependent on previous experience. In our studies the nature of previous hospital experience and patients' expectations was not considered, which is a limitation that future studies should overcome. Our field study was conducted in Portuguese public hospitals. For the sake of understanding the dynamics of patients expectations, needs, perceptions, and resulting well-being, future studies could compare patients from public and private hospitals, controlling for the patients' socio-economical level.

Although in Portugal there is a universal access to healthcare, tendentiously gratuitous, currently several factors are impelling patients to purchase health insurances so they can use private hospitals (e.g., long waiting lists in public hospitals). These patients can exercise an active choice in terms of the type of hospital they utilize and, because they are "clients" besides being "patients", their expectations may be higher regarding certain aspects of the quality of care (including the physical environment). Accordingly, healthcare providers and managers are responding to these consumerist pressures by introducing to clinics and hospitals consumption spaces similar to those of private, commercial outlets including shops and hotels (Gesler, Bell, Curtis, Hubbard, & Francis, 2004). Based on our findings and on findings of previous studies, we can

hypothesize that the aesthetic quality and modernity of the physical environment is one of the reasons (e.g., besides being faster and easier to make an appointment) why patients in private hospitals receive, and perceive they receive, a good care.

Public hospitals will continue to serve (not only, but certainly) the population with less economical resources that is excluded from the market of private services. Although national surveys have been showing that Portuguese people tend to trust the Portuguese National Health Service (e.g., TESE, 2009), the fact that it this service is tendentiously “free” is associated with lower expectations regarding certain aspects of care or with higher tolerance to non-ideal conditions, which is related to a “gratitude bias” (Cabral & Silva, 2009; Portugal, 2005). In fact, lower expectations might configure needs in such a way that can result in higher satisfaction, even if that does not represent high quality care. In an era of economical contention, it is possible that the public hospitals’ physical environment – contrary to private hospitals – becomes increasingly neglected, and this might be accepted and tolerated by patients. However, considering that the physical environment can affect patients’ well-being and other relevant health-related outcomes, public hospitals should be aware that an inadequate physical environment can represent an additional risk factor to their patients’ well-being.

There is an emergent body of evidence showing that health outcomes are a result of social factors such as socio-economical status. Richer people tend to live longer and to have less illness alive than economically less able. These health inequalities are explained not only by the fact that lower socio-economic groups engage in more health damaging and less health promoting behaviors, but also because they are exposed to more health-damaging environments (such as dangerous working settings, and low-quality housing), so being more exposed to stress, although having fewer resources to cope with it (Morrison & Bennet, 2006). Providing appropriate hospital physical environments should be viewed not only as therapeutic, but also an element to promote people’ dignity, and health equality. Besides, providing a good physical environment would probably be a good cost-benefit investment of healthcare organizations.

Healthcare managers and providers interested that patients have a positive and satisfying experience should be aware that the hospital physical environment needs to be welcoming and pleasant “enough”. Outpatient areas, that often deserve less attention in terms of upkeep and maintenance, were found to be especially important to patients. Consequently, the focus of healthcare buildings’ design and maintenance should be the

care delivery and the patients' needs and preferences. In this context, PHEQIs may be a useful instrument to assess and monitor the patients' perceptions.

The work that was reported in this thesis intended to better understand the specific contribution of the hospital physical environment to patients' well-being. The results we obtained are a small step towards a more integrated approach of the factors that affect the patients' experience, and hopefully will induce interest for future investigation, and for improvement of health care environments.

4. References

- Andrade, C. C., Hernández-Fernaud, E., & Lima, M. L., (2013). A better physical environment in the workplace means higher well-being? – A study with healthcare professionals. *Psychology*, 4(1), 89-110.
- Arneill, A. B., & Devlin, A. S. (2002). Perceived quality of care: the influence of the waiting room environment. *Journal of Environmental Psychology*, 22(4), 345–360. doi:10.1006/jevp.2002.0274
- Bailey, K. A. (2002). The role of the physical environment for children in residential care. *Residential Treatment for Children & Youth*, 20(1), 15-27.
- Baillie, L. (2009). Patient dignity in an acute hospital setting: a case study. *International Journal of Nursing Studies*, 46(1), 23–36. doi:10.1016/j.ijnurstu.2008.08.003
- Becker, F. D., & Douglass, S. (2008). The ecology of the patient visit: physical attractiveness, waiting times, and perceived quality of care. *The Journal of Ambulatory Care Management*, 31(2), 128–41. doi:10.1097/01.JAC.0000314703.34795.44
- Becker, F. D., & Poe, D. B. (1980). The effects of user-generated design modifications in a general hospital. *Journal of Nonverbal Behavior*, 4(4), 195–218. doi:10.1007/BF00986197
- Cabral, M. V., & Silva, P. A. (2009). *O Estado da saúde em Portugal*. Lisboa: Imprensa de Ciências Sociais.
- Cristophe, V., & Rimè, B. (1997). Exposure to the social sharing of emotion: Emotional impact, listener responses and secondary social sharing. *European Journal of Social Psychology*, 27, 37-54.
- Devlin, A. S. (2008). Judging a book by Its cover: Medical building facades and judgments of care. *Environment and Behavior*, 40(3), 307–329. doi:10.1177/0013916507302242

- Dijkstra, K., Pieterse, M., & Pruyn, A. (2008). Stress-reducing effects of indoor plants in the built healthcare environment: the mediating role of perceived attractiveness. *Preventive medicine, 47*(3), 279–83. doi:10.1016/j.ypmed.2008.01.013
- Gesler, W., Bell, M., Curtis, S., Hubbard, P., & Francis, S. (2004). Therapy by design: evaluating the UK hospital building program. *Health & Place, 10*(2), 117–28. doi:10.1016/S1353-8292(03)00052-2
- Hagerman, I., Rasmanis, G., Blomkvist, V., Ulrich, R. S., Eriksen, C. A., & Theorell, T. (2005). Influence of intensive coronary care acoustics on the quality of care and physiological state of patients. *International Journal of Cardiology, 98*(2), 267–70. doi:10.1016/j.ijcard.2003.11.006
- Henderson, A., Van Eps, M. A., Pearson, K., James, C., Henderson, P., & Osborne, Y. (2009). Maintenance of patients' dignity during hospitalization: comparison of staff-patient observations and patient feedback through interviews. *International Journal of Nursing Practice, 15*(4), 227–30. doi:10.1111/j.1440-172X.2009.01764.x
- Leather, P., Beale, D., Santos, A., Watts, J., & Lee, L. (2003). Outcomes of environmental appraisal of different hospital waiting areas. *Environment and Behavior, 35*(6), 842–869. doi:10.1177/0013916503254777
- MacLeod, C., Mathews, A., & Tata, P. (1986). Attentional bias in emotional disorders. *Journal of Abnormal Psychology, 95*(1), 15–20.
- Malenbaum, S., Keefe, F. J., Williams, A. C., Ulrich, R., and Somers, T. J. (2008). Pain in its environmental context: Implications for designing environments to enhance pain control. *Pain, 134*, 241–244.
- Morrison, V. & Bennett, P. (2006). *An introduction to health psychology*. Harlow: Pearson/Prentice Hall.
- Portugal, S. (2005). “*Quem tem amigos tem saúde*”: O papel das redes sociais no acesso aos cuidados de saúde”, Paper presented at Oficina do CES.

- Shepley, M. M., Harris, D. D., & White, R. (2008). Open-bay and single-family room neonatal intensive care units: Caregiver satisfaction and stress. *Environment and Behavior*, 40(2), 249–268. doi:10.1177/0013916507311551
- Smith, E. R., & Mackie, D. M. (2007). *Social psychology* (3rd ed.). Philadelphia, PA: Psychology Press.
- Stephens, A. & Ayers, S. (2005). Stress, health, and illness. In S. Sutton, A. Baum, M. Johnston (Eds), *Sage Handbook of Health Psychology*. London: Sage Publications.
- Swan, J. E., Richardson, L. D., & Hutton, J. D. (2003). Do appealing hospital rooms increase patient evaluations of physicians, nurses, and hospital services? *Health Care Management Review*, 28(3), 254–64.
- TESE (2009). Necessidades em Portugal: Tradição e tendências emergentes. Retrieved in July 27th from http://www.tese.org.pt/assets/files/pdf/Relatorio_inq_questionario_Necessidades_em_Portugal.pdf#page59.
- Ulrich, R. S. (1984). View through surgery window may influence recovery from surgery. *Science*, 224(4647), 420.

6

APPENDICES

Appendix A

Original Version of PHEQIs

Sezione 1

Istruzioni

Secondo la sua esperienza personale del reparto (e ospedale) in cui si trova adesso, la preghiamo di indicare quanto si trova in accordo o in disaccordo rispetto a ciascuna delle affermazioni di seguito elencate.

Per ogni frase, metta una sola crocetta sul numero corrispondente alla sua opinione rispetto alla frase, secondo la seguente scala:

Del tutto in Disaccordo	Abbastanza in Disaccordo	Né in Disaccordo Né d'Accordo	Abbastanza d'Accordo	Del tutto d'Accordo
0	1	2	3	4

Esempi

00	Questo ospedale è piccolo.	0	1	2	3 X	4
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Se Lei si ritiene abbastanza d'accordo con il contenuto della frase, per rispondere deve mettere una crocetta sul numero 3.

00	In questo reparto ci sono molti pazienti.	0 X	1	2	3	4
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Se Lei si ritiene del tutto in disaccordo con il contenuto della frase, per rispondere deve mettere una crocetta sul numero 0.

Aspetti Fisico-Spaziali: SPAZI ESTERNI

Concentri la sua attenzione sugli SPAZI ESTERNI DELL'OSPEDALE, cioè le zone all'aperto, fuori dagli edifici, che sono comunque comprese all'interno dell'area ospedaliera.

Indichi il suo grado di accordo o disaccordo con le affermazioni riportate qui sotto (riferite agli spazi esterni dell'ospedale), usando la seguente scala:

Del tutto in Disaccordo	Abbastanza in Disaccordo	Né in Disaccordo Né d'Accordo	Abbastanza d'Accordo	Del tutto d'Accordo
0	1	2	3	4

1	L'entrata dell'ospedale è accogliente.	0	1	2	3	4
2	Visti da fuori, gli edifici di questo ospedale sono belli.	0	1	2	3	4
3	Nell'area esterna dell'ospedale la segnaletica è poco chiara.	0	1	2	3	4
4	Le strade e i marciapiedi dell'ospedale sono in buono stato.	0	1	2	3	4
5	Mancano spazi verdi con panchine per sedersi.	0	1	2	3	4
6	L'area esterna dell'ospedale è poco pulita.	0	1	2	3	4
7	Nell'area esterna dell'ospedale è difficile orientarsi.	0	1	2	3	4
8	Ci sono begli alberi.	0	1	2	3	4
9	Visti da fuori, i colori degli edifici di questo ospedale sono poco gradevoli.	0	1	2	3	4
10	In questo ospedale è facile trovare i reparti o i servizi che si cercano.	0	1	2	3	4
11	Ci sono spazi verdi dove è possibile rilassarsi o incontrare gli altri.	0	1	2	3	4
12	L'area esterna dell'ospedale è ben tenuta.	0	1	2	3	4
13	Visti da fuori, gli edifici di questo ospedale hanno brutte forme.	0	1	2	3	4
14	Mancano spazi verdi ben curati.	0	1	2	3	4
15	Nell'area esterna dell'ospedale i segnali per orientarsi sono abbondanti.	0	1	2	3	4
16	Molti edifici dell'ospedale sono in cattivo stato.	0	1	2	3	4

Aspetti Fisico-Spaziali: REPARTO e AREA DEGENZA

Concentri ora la sua attenzione su questo REPARTO, in particolare SULL'AREA DEGENZA.

Indichi il suo grado di accordo o disaccordo con le affermazioni riportate qui sotto (riferite al reparto e all'area degenza), usando la seguente scala:

Del tutto in Disaccordo	Abbastanza in Disaccordo	Né in Disaccordo Né d'Accordo	Abbastanza d'Accordo	Del tutto d'Accordo
0	1	2	3	4

1	L'entrata di questo reparto è chiaramente riconoscibile.	0	1	2	3	4
2	Qui nel complesso c'è quiete.	0	1	2	3	4
3	Dentro questo reparto è difficile orientarsi.	0	1	2	3	4
4	Si sente spesso del frastuono proveniente dall'esterno	0	1	2	3	4
5	L'entrata di questo reparto è accogliente.	0	1	2	3	4
6	Le postazioni dove chiedere le informazioni sono posizionate male.	0	1	2	3	4
7	Si sentono spesso urla o schiamazzi.	0	1	2	3	4
8	La segnaletica permette di trovare facilmente quel che si cerca.	0	1	2	3	4
9	Questo è un reparto pulito.	0	1	2	3	4
10	Le postazioni dove chiedere le informazioni sono chiaramente riconoscibili.	0	1	2	3	4
11	Si sentono pochi rumori dall'esterno.	0	1	2	3	4
12	I segnali per orientarsi sono pochi.	0	1	2	3	4
13	L'illuminazione solare è scarsa.	0	1	2	3	4
14	L'arredamento (letti, armadi, comodini, sedie, tavoli, ecc.) è in condizioni scadenti.	0	1	2	3	4
15	Le finestre hanno grandi vetrate.	0	1	2	3	4
16	Le pareti, i pavimenti e i soffitti hanno un aspetto poco gradevole.	0	1	2	3	4

Del tutto in Disaccordo	Abbastanza in Disaccordo	Né in Disaccordo Né d'Accordo	Abbastanza d'Accordo	Del tutto d'Accordo
0	1	2	3	4

17	L'intensità della luce artificiale è soddisfacente.	0	1	2	3	4
18	Dalle finestre si vedono zone verdi.	0	1	2	3	4
19	Le camere sono sufficientemente grandi.	0	1	2	3	4
20	Ci sono pochi bagni.	0	1	2	3	4
21	Dalle finestre c'è una visuale poco interessante.	0	1	2	3	4
22	Il numero di posti-letto per camera è adeguato.	0	1	2	3	4
23	Le finestre sono poco pulite.	0	1	2	3	4
24	Ci sono spazi di aspetto gradevole dove i pazienti possono incontrare i visitatori.	0	1	2	3	4
25	L'arredamento (letti, armadi, comodini, sedie, tavoli, ecc.) è di buona fattura.	0	1	2	3	4
26	Mancano armadi capienti per i pazienti.	0	1	2	3	4
27	Ci vorrebbero più finestre.	0	1	2	3	4
28	Le pareti, i pavimenti e i soffitti hanno bei colori.	0	1	2	3	4
29	La temperatura è poco adeguata (fa troppo caldo o troppo freddo).	0	1	2	3	4
30	Le pareti, i pavimenti e i soffitti sono ben tenuti.	0	1	2	3	4
31	Ci sono sale di attesa per i visitatori di aspetto gradevole.	0	1	2	3	4
32	Si sente la mancanza di uno spazio all'aperto (terrazzo o giardino) dove è possibile sedersi o incontrare gli altri.	0	1	2	3	4

Del tutto in Disaccordo	Abbastanza in Disaccordo	Né in Disaccordo Né d'Accordo	Abbastanza d'Accordo	Del tutto d'Accordo
0	1	2	3	4

33	I bagni sono poco confortevoli.	0	1	2	3	4
34	C'è poco spazio sui comodini dei pazienti per poggiare gli effetti personali.	0	1	2	3	4
35	L'arredamento (letti, armadi, comodini, sedie, tavoli, ecc.) è di aspetto poco gradevole.	0	1	2	3	4
36	C'è sufficiente ricambio d'aria dall'esterno.	0	1	2	3	4
37	I bagni sono troppo piccoli.	0	1	2	3	4
38	I posti a sedere sono poco comodi.	0	1	2	3	4
39	Mancano sale di attesa o incontro ben attrezzate (sedie, tavoli, Tv, ecc.).	0	1	2	3	4
40	I bagni hanno un aspetto gradevole.	0	1	2	3	4
41	Il livello di umidità dell'aria è adeguato (né troppo umido, né troppo secco).	0	1	2	3	4
42	Le pareti, i pavimenti e i soffitti sono in cattive condizioni.	0	1	2	3	4
43	L'aria è irrespirabile.	0	1	2	3	4
44	L'arredamento (letti, armadi, comodini, sedie, tavoli, ecc.) è in buone condizioni.	0	1	2	3	4

Aspetti Sociali e Funzionali del REPARTO

Concentri ora la sua attenzione sugli aspetti sociali e funzionali di QUESTO REPARTO.

Indichi il suo grado di accordo o disaccordo con le affermazioni riportate qui sotto (riferite ad aspetti sociali e funzionali del reparto), usando la seguente scala:

Del tutto in Disaccordo	Abbastanza in Disaccordo	Né in Disaccordo Né d'Accordo	Abbastanza d'Accordo	Del tutto d'Accordo
0	1	2	3	4

1	Qui le persone ricevono una buona accoglienza dal personale.	0	1	2	3	4
2	Qui il personale paramedico è in genere poco disponibile dal punto di vista umano.	0	1	2	3	4
3	Qui le visite mediche sono condotte in maniera soddisfacente per il paziente.	0	1	2	3	4
4	Qui i medici in genere danno poche informazioni su esami, terapie e interventi necessari.	0	1	2	3	4
5	Qui c'è un buon clima di collaborazione tra gli operatori sanitari.	0	1	2	3	4
6	Qui i medici sono in genere poco disponibili dal punto di vista umano.	0	1	2	3	4
7	Questo è un reparto poco organizzato.	0	1	2	3	4
8	Qui ci sono regole troppo rigide che limitano le persone.	0	1	2	3	4
9	Qui è chiaro a chi ci si deve rivolgere per sapere le cose.	0	1	2	3	4
10	Qui è facile per i pazienti individuare nome, cognome e ruolo degli operatori.	0	1	2	3	4
11	Qui è possibile parlare di cose delicate con il personale senza che gli altri ascoltino.	0	1	2	3	4
12	Spesso le stanze di questo reparto sono troppo affollate.	0	1	2	3	4
13	Qui si ha l'impressione di avere gli occhi degli altri puntati addosso.	0	1	2	3	4
14	Qui le persone sono in genere poco invadenti.	0	1	2	3	4
15	Qui i pazienti possono crearsi un proprio spazio personale.	0	1	2	3	4
16	Qui la gente fa troppi pettegolezzi.	0	1	2	3	4

Sezione 2

Istruzioni

La preghiamo ora di rispondere ad alcune domande circa la sua esperienza di questo reparto e circa le sue caratteristiche socio-demografiche.

1) Nel complesso, quanto è soddisfatto di questo reparto?

Per niente Poco Mediamente Abbastanza Del tutto

2) Sceglierebbe ancora questo reparto?

Per niente Poco Mediamente Abbastanza Del tutto

3) Consiglierebbe questo reparto ad amici o conoscenti?

Per niente Poco Mediamente Abbastanza Del tutto

4) Lei è..... Femmina Maschio

5) Qual è la sua età? _____ anni

6) Qual è il suo titolo di studio?

Licenza elementare Licenza media inferiore
Licenza media superiore Laurea

7) Come definirebbe il livello socio-economico del suo nucleo familiare?

Basso Medio-basso Medio-alto Alto

8) Qual è la sua attività lavorativa principale?

- operatore sanitario (medico, infermiere, portantino, ecc.)
 imprenditore operaio comune
 libero professionista operaio specializzato
 dirigente artigiano
 commerciante impiegato/a
 insegnante casalinga
 studente/essa pensionato/a
 altro (specificare) _____

9) Lei si trova in questo reparto perché è un:

- Paziente ricoverato Visitatore (parente, amico, ecc.)
 Operatore
 altro (specificare) _____

Sezione 3

AREA DI ATTESA

Questa parte contiene frasi che riguardano quelle aree (poste in prossimità di nodi funzionali quali l'accettazione, gli ambulatori, il day-hospital, le camere di degenza, ecc.) destinate all'attesa da parte di utenti e accompagnatori.

Per le sue valutazioni, si riferisca all'area in cui si trova ora.

Del tutto in Disaccordo	Abbastanza in Disaccordo	Né in Disaccordo Né d'Accordo	Abbastanza d'Accordo	Del tutto d'Accordo
0	1	2	3	4

1	Quest'area attesa è poco illuminata dalla luce del sole.	0	1	2	3	4
2	In quest'area attesa gli arredi sono in condizioni scadenti.	0	1	2	3	4
3	Quest'area attesa ha grandi vetrate.	0	1	2	3	4
4	Le pareti, i pavimenti e i soffitti di quest'area attesa hanno un aspetto poco gradevole.	0	1	2	3	4

Del tutto in Disaccordo	Abbastanza in Disaccordo	Né in Disaccordo Né d'Accordo	Abbastanza d'Accordo	Del tutto d'Accordo		
0	1	2	3	4		
5	Quest'area attesa è chiaramente delimitata.	0	1	2	3	4
6	In quest'area attesa ci sono pochi posti a sedere rispetto al numero di persone.	0	1	2	3	4
7	In quest'area attesa l'intensità della luce artificiale è soddisfacente.	0	1	2	3	4
8	Dalle finestre di quest'area attesa si vedono zone verdi.	0	1	2	3	4
9	Quest'area attesa è sufficientemente grande.	0	1	2	3	4
10	In quest'area attesa gli arredi sono di buona fattura.	0	1	2	3	4
11	Le pareti, i pavimenti e i soffitti di quest'area attesa hanno bei colori.	0	1	2	3	4
12	Le sedie di quest'area attesa sono poco comode.	0	1	2	3	4
13	In quest'area attesa la temperatura è poco adeguata (fa troppo caldo o troppo freddo).	0	1	2	3	4
14	In quest'area attesa gli arredi sono poco gradevoli.	0	1	2	3	4
15	In quest'area attesa ci vorrebbero più finestre.	0	1	2	3	4
16	In quest'area attesa c'è sufficiente ricambio d'aria dall'esterno.	0	1	2	3	4
17	Le finestre di quest'area attesa sono poco pulite.	0	1	2	3	4
18	Le pareti, i pavimenti e i soffitti di quest'area attesa sono ben tenuti.	0	1	2	3	4
19	Dalle finestre di quest'area attesa c'è una vista poco interessante.	0	1	2	3	4
20	In quest'area attesa gli arredi sono in buone condizioni.	0	1	2	3	4
21	In quest'area attesa il livello di umidità dell'aria è adeguato (né troppo umido, né troppo secco).	0	1	2	3	4
22	In quest'area attesa sono presenti elementi di distrazione (sedie, TV, ecc.) che aiutano a far passare il tempo.	0	1	2	3	4
23	Quest'area attesa è poco accogliente.	0	1	2	3	4
24	Quest'area attesa è pulita.	0	1	2	3	4
25	In quest'area attesa l'aria è irrespirabile.	0	1	2	3	4
26	Le pareti, i pavimenti e i soffitti di quest'area attesa sono in cattive condizioni.	0	1	2	3	4

Appendix B

Questionnaire for Inpatients

(Study 1 & Study 2)

QUESTIONÁRIO

HOSPITAL CURRY CABRAL – SERVIÇO DE ORTOPEDIA

UTENTES - INTERNAMENTO

Estamos a efectuar um estudo de opinião em vários serviços hospitalares, entre os quais o **Serviço de Ortopedia do Hospital Curry Cabral**.

O objectivo é estudar a forma como os utentes pensam acerca das condições do espaço físico onde o serviço que encontra.

Este estudo visa melhorar as condições das instalações dos serviços hospitalares.
A sua opinião é muito importante para nós.

Não existem respostas certas ou erradas.

As **suas respostas são totalmente confidenciais**: não serão reveladas a ninguém.

Muito obrigado pela sua colaboração,

A Equipa de Investigação.

Para obter qualquer informação contacte a investigadora responsável:

201

INSTRUÇÕES GERAIS

Neste questionário vão ser apresentadas várias perguntas sobre a sua experiência neste serviço de Ortopedia. Em algumas delas ser-lhe-á pedido que responda numa escala de resposta como, por exemplo, a seguinte que, neste caso, mediria a satisfação:

Nada satisfeito(a)	0	1	2	3	4	5	6	7	8	9	10	Muito satisfeito(a)
	← menos				+/-	mais →						

Assim, se sentisse “**pouca satisfação**” deveria assinalar um número entre **0 e 4** (quanto mais para a esquerda, menos satisfação). Se, pelo contrário, sentisse “**alguma satisfação**”, deveria assinalar um número entre **6 e 10** (quanto mais para a direita, mais satisfação).

O **ponto 5 representa indiferença**: significaria que não se sentia satisfeito(a) nem insatisfeito(a).

[Por exemplo, se se sentisse bastante satisfeito(a), mas não totalmente, deveria assinalar o número **8**.]

Por favor, siga esta lógica nas próximas perguntas com uma escala de resposta semelhante a esta.

PARTE 1

OPINIÃO SOBRE O SERVIÇO DE ORTOPEDIA

1. Considerando a experiência global neste serviço, em geral, qual o seu nível de satisfação?

Nenhuma satisfação	0	1	2	3	4	5	6	7	8	9	10	Muitíssima satisfação
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2. Até que ponto este Serviço de Ortopedia corresponde às suas expectativas?

Nada	0	1	2	3	4	5	6	7	8	9	10	Totalmente
------	---	---	---	---	---	---	---	---	---	---	----	------------

3. Até que ponto este Serviço de Ortopedia responde às suas necessidades?

Nada	0	1	2	3	4	5	6	7	8	9	10	Totalmente
------	---	---	---	---	---	---	---	---	---	---	----	------------

4. Imagine agora um Serviço de Ortopedia perfeito em todos os aspectos. A que distância pensa que este Serviço de Ortopedia está?

Muito distante	0	1	2	3	4	5	6	7	8	9	10	Muito próximo
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PARTE 2

BEM-ESTAR

1. Como é que se sente neste momento?

INSTRUÇÕES: Responda a uma linha de cada vez. Em cada uma delas assinale um número. Quanto mais para a **esquerda do 5** (entre 0 e 4), mais triste / mal / negativo(a). Quanto mais para a **direita do 5** (entre 6 e 10), mais contente / bem / positivo(a). O **número 5** representa “nem uma coisa nem outra”.

a. Triste	←	0	1	2	3	4	5	6	7	8	9	10	→	Contente
b. Mal	←	0	1	2	3	4	5	6	7	8	9	10	→	Bem
c. Negativo(a)	←	0	1	2	3	4	5	6	7	8	9	10	→	Positivo(a)

2. Em geral, diria que a sua saúde é:

Fraca	0	1	2	3	4	5	6	7	8	9	10	Óptima
-------	---	---	---	---	---	---	---	---	---	---	----	--------

3. Classifique a intensidade da dor que sente neste momento, utilizando a seguinte escala:

😊	0	1	2	3	4	5	6	7	8	9	10	☹️
Sem dor						Dor moderada						Dor máxima

PARTE 3

OPINIÃO SOBRE O AMBIENTE, ARQUITECTURA E DESIGN HOSPITALAR

Indique em que medida concorda ou discorda com cada uma das afirmações seguintes.

Para cada frase, assinale com um círculoo número que melhor corresponde à sua opinião. Utilize a seguinte escala para responder:

0	1	2	3	4	N.A.
DISCORDO TOTALMENTE	DISCORDO EM PARTE	NEM CONCORDO NEM DISCORDO	CONCORDO EM PARTE	CONCORDO TOTALMENTE	Não se aplica

INSTRUÇÕES: **Sediscordar**, deve assinalar um número à esquerda, 0 ou 1 (quanto mais à esquerda, mais discorda). **Seconcordar**, deve assinalar um número à direita, 3 ou 4 (quanto mais à direita, mais concorda). O número 2 (ao centro) representa indiferença e significa que **nem concorda nem discorda**. Assinale **N.A.** (não se aplica) apenas quando nunca tiver tido determinada experiência e lhe for impossível responder (por exemplo: se nunca esteve na casa de banho não sabe se é grande, a pergunta não se aplica).

3.1. ESPAÇO EXTERIOR

Pense nas zonas ao ar livre fora dos edifícios e que, ainda assim, fazem parte da área hospitalar.

Concorda que...?

	0	1	2	3	4	N.A.
1. A entrada do hospital é acolhedora.	0	1	2	3	4	N.A.
2. Vistos de fora, os edifícios do hospital são bonitos.	0	1	2	3	4	N.A.
3. Na área exterior do hospital a sinalética (conjunto de sinais para orientação) é <u>pouco</u> clara.	0	1	2	3	4	N.A.
4. Na área exterior do hospital as estradas e os passeios estão em bom estado.	0	1	2	3	4	N.A.
5. Na área exterior do hospital <u>faltam</u> espaços verdes com bancos para sentar.	0	1	2	3	4	N.A.
6. A área exterior do hospital está <u>pouco</u> limpa.	0	1	2	3	4	N.A.
7. Na área exterior do hospital é difícil uma pessoa orientar-se.	0	1	2	3	4	N.A.
8. Na área exterior do hospital há árvores bonitas.	0	1	2	3	4	N.A.
9. Vistas de fora, as cores dos edifícios do hospital são <u>pouco</u> agradáveis.	0	1	2	3	4	N.A.
10. Na área exterior do hospital há espaço suficiente para estacionar.	0	1	2	3	4	N.A.
11. Na área exterior do hospital é fácil encontrar os serviços de que se está à procura.	0	1	2	3	4	N.A.
12. Na área exterior do hospital há espaços verdes onde é possível relaxar ou encontrar outras pessoas.	0	1	2	3	4	N.A.
13. A área exterior do hospital está bem cuidada.	0	1	2	3	4	N.A.
14. Vistos de fora, os edifícios deste hospital têm formas feias.	0	1	2	3	4	N.A.
15. Na área exterior do hospital <u>faltam</u> espaços verdes bem cuidados.	0	1	2	3	4	N.A.
16. Na área exterior do hospital há muitos sinais para orientação.	0	1	2	3	4	N.A.
17. Muitos edifícios do hospital estão em mau estado.	0	1	2	3	4	N.A.
18. Há locais próximos onde se podem encontrar transportes públicos.	0	1	2	3	4	N.A.

3.1.2. De um modo geral, como classifica a qualidade do espaço físico exterior do hospital?

Péssima qualidade	0	1	2	3	4	5	6	7	8	9	10	Excelente qualidade
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3.2. SERVIÇO DE ORTOPEDIA E ÁREA DE INTERNAMENTO

Pense agora neste SERVIÇO DE ORTOPEDIA, em particular sobre a ÁREA DE INTERNAMENTO. Indique o seu grau de acordo ou desacordo com as afirmações que se seguem. **Concorda que...?**

0	1	2	3	4	N.A.		
DISCORDO TOTALMENTE	DISCORDO EM PARTE	NEM CONCORDO NEM DISCORDO	CONCORDO EM PARTE	CONCORDO TOTALMENTE	Não se aplica		
1.	A entrada deste serviço é claramente reconhecível.	0	1	2	3	4	N.A.
2.	Em geral, este serviço é tranquilo.	0	1	2	3	4	N.A.
3.	Dentro deste serviço é difícil uma pessoa orientar-se.	0	1	2	3	4	N.A.
4.	Ouve-se frequentemente barulho proveniente do exterior.	0	1	2	3	4	N.A.
5.	A entrada deste serviço é acolhedora.	0	1	2	3	4	N.A.
6.	Os locais onde se pedem informações estão mal localizados.	0	1	2	3	4	N.A.
7.	Ouvem-se frequentemente gritos ou gemidos.	0	1	2	3	4	N.A.
8.	A sinalética (conjunto de sinais para orientação) permite encontrar facilmente aquilo que se procura.	0	1	2	3	4	N.A.
9.	Este serviço é limpo.	0	1	2	3	4	N.A.
10.	Os locais onde se pedem informações estão claramente reconhecíveis.	0	1	2	3	4	N.A.
11.	Ouvem-se poucos ruídos do exterior.	0	1	2	3	4	N.A.
12.	Há poucos sinais para orientação.	0	1	2	3	4	N.A.
13.	Esta área de internamento é pouco iluminada pela luz do sol.	0	1	2	3	4	N.A.
14.	A mobília (camas, armários, cómodas, cadeiras, mesas, etc.) está em más condições.	0	1	2	3	4	N.A.
15.	As janelas têm vidros grandes.	0	1	2	3	4	N.A.
16.	As paredes, os pavimentos e os tectos têm um aspecto pouco agradável.	0	1	2	3	4	N.A.
17.	A intensidade da luz artificial é satisfatória.	0	1	2	3	4	N.A.
18.	Das janelas vêem-se espaços verdes.	0	1	2	3	4	N.A.
19.	Os quartos são suficientemente grandes.	0	1	2	3	4	N.A.
20.	Há poucas casas de banho.	0	1	2	3	4	N.A.
21.	Das janelas tem-se uma vista pouco interessante.	0	1	2	3	4	N.A.
22.	O número de camas por quarto é adequado.	0	1	2	3	4	N.A.
23.	As janelas estão pouco limpas.	0	1	2	3	4	N.A.
24.	Neste serviço há espaços com aspecto agradável onde os doentes se podem encontrar com as visitas.	0	1	2	3	4	N.A.

0	1	2	3	4	N.A.		
DISCORDO TOTALMENTE	DISCORDO EM PARTE	NEM CONCORDO NEM DISCORDO	CONCORDO EM PARTE	CONCORDO TOTALMENTE	Não se aplica		
25.	A mobília (camas, armários, cómodas, cadeiras, mesas, etc.) é de boa qualidade.	0	1	2	3	4	N.A.
26.	Há falta de espaço nos armários para os doentes.	0	1	2	3	4	N.A.
27.	Devia haver mais janelas.	0	1	2	3	4	N.A.
28.	As paredes, os pavimentos e os tectos têm cores bonitas.	0	1	2	3	4	N.A.
29.	A temperatura é pouco adequada (está demasiado quente ou demasiado frio).	0	1	2	3	4	N.A.
30.	As paredes, os pavimentos e os tectos estão bem cuidados.	0	1	2	3	4	N.A.
31.	As salas de espera para as visitas têm um aspecto agradável.	0	1	2	3	4	N.A.

32. Sente-se a falta de um espaço ao ar livre (terraço ou jardim) onde seja possível sentar e encontrar outras pessoas.	0	1	2	3	4	N.A.
33. As casas de banho são <u>pouco</u> confortáveis.	0	1	2	3	4	N.A.
34. Há <u>pouco</u> espaço nas cómodas para os doentes colocarem os seus bens pessoais.	0	1	2	3	4	N.A.
35. A mobília (camas, armários, cómodas, cadeiras, mesas, etc.) tem um aspecto <u>pouco</u> agradável.	0	1	2	3	4	N.A.
36. Há suficiente troca de ar com o exterior.	0	1	2	3	4	N.A.
37. As casas de banho são demasiado pequenas.	0	1	2	3	4	N.A.
38. Os lugares para sentar são <u>pouco</u> cómodos.	0	1	2	3	4	N.A.
39. Neste serviço faltam salas de espera ou de convívio bem equipadas (cadeiras, mesas, TV, etc.).	0	1	2	3	4	N.A.
40. As casas de banho têm um aspecto agradável.	0	1	2	3	4	N.A.
41. O nível de humidade do ar é adequado (nem demasiado húmido, nem demasiado seco).	0	1	2	3	4	N.A.
42. As paredes, os pavimentos e os tectos estão em más condições.	0	1	2	3	4	N.A.
43. O ar é irrespirável.	0	1	2	3	4	N.A.
44. A mobília (camas, armários, cómodas, cadeiras, mesas, etc.) está em boas condições.	0	1	2	3	4	N.A.
45. Esta área de internamento está claramente delimitada.	0	1	2	3	4	N.A.

3.2.1. De um modo geral, como classifica a qualidade do espaço físico deste serviço hospitalar e, em particular, da área de internamento onde se encontra agora?

Péssima qualidade	0	1	2	3	4	5	6	7	8	9	10	Excelente qualidade
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PARTE 4

Foque agora a sua atenção nos ASPECTOS SOCIAIS E FUNCIONAIS DESTES SERVIÇO. Concorda que...?

0	1	2	3	4	N.A.
DISCORDO TOTALMENTE	DISCORDO EM PARTE	NEM CONCORDO NEM DISCORDO	CONCORDO EM PARTE	CONCORDO TOTALMENTE	Não se aplica

1. Neste serviço as pessoas recebem um bom acolhimento por parte dos profissionais de saúde.	0	1	2	3	4	N.A.
2. Em geral, o pessoal de enfermagem está <u>pouco</u> disponível do ponto de vista humano.	0	1	2	3	4	N.A.
3. As consultas médicas são conduzidas de forma satisfatória para o doente.	0	1	2	3	4	N.A.
4. Em geral, os médicos dão <u>poucas</u> informações sobre os exames, os tratamentos e as intervenções necessárias.	0	1	2	3	4	N.A.
5. Há um bom clima de colaboração entre os profissionais de saúde.	0	1	2	3	4	N.A.
6. Em geral, o pessoal médico está <u>pouco</u> disponível do ponto de vista humano.	0	1	2	3	4	N.A.
7. Este serviço é <u>pouco</u> organizado.	0	1	2	3	4	N.A.
8. Neste serviço há regras demasiado rígidas que limitam as pessoas.	0	1	2	3	4	N.A.
9. É fácil entender a quem nos devemos dirigir para saber as informações que precisamos.	0	1	2	3	4	N.A.

10. É fácil os doentes identificarem o nome, apelido e função dos profissionais de saúde.	0	1	2	3	4	N.A.
11. É possível falar de coisas delicadas com os profissionais de saúde sem que os outros oiçam.	0	1	2	3	4	N.A.
12. As salas deste serviço estão frequentemente apinhadas de gente.	0	1	2	3	4	N.A.
13. Neste serviço tem-se a impressão de se estar a ser observado(a).	0	1	2	3	4	N.A.
14. Em geral, as pessoas são <u>pouco</u> intrometidas.	0	1	2	3	4	N.A.
15. Os doentes podem criar um espaço pessoal próprio.	0	1	2	3	4	N.A.
16. As pessoas criam muitos mexericos.	0	1	2	3	4	N.A.
17. Em geral, o pessoal auxiliar está <u>pouco</u> disponível do ponto de vista humano.	0	1	2	3	4	N.A.

4.1. De um modo geral, como classifica a qualidade do atendimento e funcionamento deste serviço?												
Péssima qualidade	0	1	2	3	4	5	6	7	8	9	10	Excelente qualidade

PARTE 5 INFORMAÇÕES SOBRE A SUA UTILIZAÇÃO DE HOSPITAIS
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1. Já alguma vez tinha vindo, por algum motivo, a este serviço de ortopedia?
1. Sim..... <input type="checkbox"/>
2. Não..... <input type="checkbox"/>
1.1. Se sim, quantas vezes?
1. 1 vez..... <input type="checkbox"/>
2. 2-3 vezes..... <input type="checkbox"/>
3. 4 vezes ou mais..... <input type="checkbox"/>

2. Voltaria a escolher este serviço?
1. Sim..... <input type="checkbox"/>
2. Não..... <input type="checkbox"/>

3. Aconselharia este serviço a amigos, familiares ou conhecidos?
1. Sim..... <input type="checkbox"/>
2. Não..... <input type="checkbox"/>

4. Relativamente à sua utilização de hospitais de um modo geral, refira:
4.1. Em média, quantas vezes por ano (pelos vários motivos possíveis) costuma ir a um hospital (este ou outro)?
_____ vezes por ano.
4.2. Já alguma vez esteve num hospital privado?
1. Sim..... <input type="checkbox"/>
2. Não..... <input type="checkbox"/>

5. Há quantos dias está internado(a) neste serviço de Ortopedia?

_____ dias.

5.1. Considera esse tempo:

1 Pouco tempo 2 Algum tempo 3 Muito tempo 4 Muitíssimo tempo

6. Durante este internamento tem tido visitas?

1 Nenhuma visita 2 Algumas visitas 3 Bastantes visitas 4 Muitas visitas

**PARTE 6
INFORMAÇÕES PESSOAIS**

1. Idade:

_____ anos

2. Sexo:

1. Feminino
2. Masculino

3. Estado civil:

1. Solteiro(a)
2. Casado(a) / Coabitação / União de facto
3. Outro. Qual?

4. Tem filhos?

1. Sim 4.1. Se sim, quantos? _____ filhos.
2. Não

5. Contando consigo, qual o número de pessoas que compõem o seu agregado familiar (as pessoas que vivem consigo na sua residência habitual)?

_____ pessoas.

6. Qual é o seu grau de escolaridade?

1. 1.º Ciclo do ensino básico (4ª classe)
2. 2º Ciclo do ensino básico (6º ano)
3. 3º Ciclo do ensino básico (9º ano ou 5º ano antigo liceu)
4. 12º Ano ou 7º ano do antigo liceu
5. Licenciatura
6. Mestrado
7. Doutoramento

7. Como definiria o nível sócio-económico do seu núcleo familiar?

BAIXO	MÉDIO-BAIXO	MÉDIO-ALTO	ALTO
1	2	3	4

8. Qual é o nível de rendimento bruto do seu agregado familiar?

- 1. Menos de 400 euros por mês.....
- 2. De 401 a 800 euros por mês.....
- 3. De 801 a 1600 euros por mês.....
- 4. De 1601 a 2400 euros por mês.....
- 5. Mais de 2400 euros por mês.....
- 1. Não sabe

9. Qual é a sua actividade profissional principal?

Designação da profissão:

Descrição da profissão (em que consiste o trabalho):

10. Como é que deu entrada neste serviço?

- 1. Foi uma cirurgia programada
- 2. Através do serviço de urgência
- 3. Encaminhado(a) pelo médico de família
- 4. Outro. Qual?

Por favor verifique se respondeu a todas as perguntas.

Muito obrigado pelo tempo que dispendeu para colaborar neste estudo.

Deixe neste espaço os seus comentários ou sugestões:

Appendix C

Questionnaire for Staff from the Inpatient Area (Study 1 & Study 2)

QUESTIONÁRIO

HOSPITAL CURRY CABRAL – SERVIÇO DE ORTOPEDIA

PROFISSIONAIS DE SAÚDE - INTERNAMENTO

Estamos a efectuar um estudo de opinião em vários serviços hospitalares, entre os quais o **Serviço de Ortopedia do Hospital Curry Cabral**.

O objectivo é estudar a forma como os utentes pensam acerca das condições do espaço físico onde o serviço que encontra.

Este estudo visa melhorar as condições das instalações dos serviços hospitalares.
A sua opinião é muito importante para nós.

Não existem respostas certas ou erradas.

As suas **respostas são totalmente confidenciais**: não serão reveladas a ninguém e destinam-se exclusivamente a fins de investigação científica.

Muito obrigado pela sua colaboração,
A Equipa de Investigação.

No final, deixe os seus comentários ou sugestões no verso da última página.

Para obter qualquer informação contacte a investigadora responsável:

INSTRUÇÕES GERAIS

Neste questionário vão ser apresentadas várias perguntas sobre a sua experiência neste serviço de Ortopedia. Em algumas delas ser-lhe-á pedido que responda numa escala de resposta como, por exemplo, a seguinte que, neste caso, mediria a satisfação:

Nada satisfeito(a)	0	1	2	3	4	5	6	7	8	9	10	Muito satisfeito(a)
	← menos				+/–	mais →						

Assim, se sentisse “**pouca satisfação**” deveria assinalar um número entre **0** e **4** (quanto mais para a esquerda, menos satisfação). Se, pelo contrário, sentisse “**alguma satisfação**”, deveria assinalar um número entre **6** e **10** (quanto mais para a direita, mais satisfação).

O **ponto 5 representa indiferença**: significaria que não se sentia satisfeito(a) nem insatisfeito(a).

[Por exemplo, se se sentisse bastante satisfeito(a), mas não totalmente, deveria assinalar o número **8**.]

Por favor, siga esta lógica nas próximas perguntas com uma escala de resposta semelhante a esta.

Está a responder a este questionário porque é:

- Auxiliar 1
- Administrativo(a) 2
- Enfermeiro(a)..... 3
- Médico(a)..... 4
- Outro (especificar): _____ ... 5

PARTE 1 OPINIÃO SOBRE O SERVIÇO DE ORTOPEDIA

**1. Imagine um Serviço de Ortopedia perfeito em todos os aspectos.
A que distância pensa que este Serviço de Ortopedia está?**

Muito distante	0	1	2	3	4	5	6	7	8	9	10	Muito próximo
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PARTE 2 BEM-ESTAR

1. Como é que se sente neste momento?

a. Triste	←	0	1	2	3	4	5	6	7	8	9	10	→	Contente
b. Mal	←	0	1	2	3	4	5	6	7	8	9	10	→	Bem
c. Negativo(a)	←	0	1	2	3	4	5	6	7	8	9	10	→	Positivo(a)

2. Em geral, diria que a sua saúde é:

Frac	0	1	2	3	4	5	6	7	8	9	10	Ótima
------	---	---	---	---	---	---	---	---	---	---	----	-------

3. Em geral, em que medida considera a sua actividade profissional geradora de stress?

NADA geradora de stress	0	1	2	3	4	5	6	7	8	9	10	EXTREMAMENTE geradora de stress
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4. Considerando todos os aspectos, quão satisfeito(a) se sente com a sua profissão?

Nada satisfeito(a)	0	1	2	3	4	5	6	7	8	9	10	Muito satisfeito(a)
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PARTE 3

OPINIÃO SOBRE O AMBIENTE, ARQUITECTURA E DESIGN HOSPITALAR

Indique em que medida concorda ou discorda com cada uma das afirmações seguintes.

Para cada frase, assinale com um círculo um número que melhor corresponde à sua opinião.

Utilize a seguinte escala para responder:

0	1	2	3	4	N.A.
DISCORDO TOTALMENTE	DISCORDO EM PARTE	NEM CONCORDO NEM DISCORDO	CONCORDO EM PARTE	CONCORDO TOTALMENTE	Não se aplica

3.1. ESPAÇO EXTERIOR

Pensenas zonas ao ar livre fora dos edifícios e que, ainda assim, fazem parte da área hospitalar.

Concorda que...?

1. A entrada do hospital é acolhedora.	0	1	2	3	4	N.A.
2. Vistos de fora, os edifícios do hospital são bonitos.	0	1	2	3	4	N.A.
3. Na área exterior do hospital a sinalética (conjunto de sinais para orientação) é <u>pouco</u> clara.	0	1	2	3	4	N.A.
4. Na área exterior do hospital as estradas e os passeios estão em bom estado.	0	1	2	3	4	N.A.
5. Na área exterior do hospital <u>faltam</u> espaços verdes com bancos para sentar.	0	1	2	3	4	N.A.
6. A área exterior do hospital está <u>pouco</u> limpa.	0	1	2	3	4	N.A.
7. Na área exterior do hospital é difícil uma pessoa orientar-se.	0	1	2	3	4	N.A.
8. Na área exterior do hospital há árvores bonitas.	0	1	2	3	4	N.A.
9. Vistas de fora, as cores dos edifícios do hospital são <u>pouco</u> agradáveis.	0	1	2	3	4	N.A.
10. Na área exterior do hospital há espaço suficiente para estacionar.	0	1	2	3	4	N.A.
11. Na área exterior é fácil encontrar os serviços de que se está à procura.	0	1	2	3	4	N.A.
12. Na área exterior do hospital há espaços verdes onde é possível relaxar ou encontrar outras pessoas.	0	1	2	3	4	N.A.
13. A área exterior do hospital está bem cuidada.	0	1	2	3	4	N.A.
14. Vistos de fora, os edifícios do hospital têm formas feias.	0	1	2	3	4	N.A.
15. Na área exterior do hospital <u>faltam</u> espaços verdes bem cuidados.	0	1	2	3	4	N.A.
16. Na área exterior do hospital há muitos sinais para orientação.	0	1	2	3	4	N.A.
17. Muitos edifícios do hospital estão em mau estado.	0	1	2	3	4	N.A.
18. Há locais próximos onde se podem encontrar transportes públicos.	0	1	2	3	4	N.A.

3.1.2. De um modo geral, como classifica a qualidade do espaço físico exterior do hospital?

Péssima qualidade	0	1	2	3	4	5	6	7	8	9	10	Excelente qualidade
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3.2. SERVIÇO DE ORTOPEDIA E ÁREA DE INTERNAMENTO

Pense agora neste SERVIÇO DE ORTOPEDIA, em particular sobre a ÁREA DE INTERNAMENTO. Indique o seu grau de acordo ou desacordo com as afirmações que se seguem. **Concorda que...?**

0	1	2	3	4	N.A.		
DISCORDO TOTALMENTE	DISCORDO EM PARTE	NEM CONCORDO NEM DISCORDO	CONCORDO EM PARTE	CONCORDO TOTALMENTE	Não se aplica		
1.	A entrada deste serviço é claramente reconhecível.	0	1	2	3	4	N.A.
2.	Em geral, este serviço é tranquilo.	0	1	2	3	4	N.A.
3.	Dentro deste serviço é difícil uma pessoa orientar-se.	0	1	2	3	4	N.A.
4.	Ouve-se frequentemente barulho proveniente do exterior.	0	1	2	3	4	N.A.
5.	A entrada deste serviço é acolhedora.	0	1	2	3	4	N.A.
6.	Os locais onde se pedem informações estão mal localizados.	0	1	2	3	4	N.A.
7.	Ouvem-se frequentemente gritos ou gemidos.	0	1	2	3	4	N.A.
8.	A sinalética (conjunto de sinais para orientação) permite encontrar facilmente aquilo que se procura.	0	1	2	3	4	N.A.
9.	Este serviço é limpo.	0	1	2	3	4	N.A.
10.	Os locais onde se pedem informações estão claramente reconhecíveis.	0	1	2	3	4	N.A.
11.	Ouvem-se <u>poucos</u> ruídos do exterior.	0	1	2	3	4	N.A.
12.	Há <u>poucos</u> sinais para orientação.	0	1	2	3	4	N.A.
13.	Esta área de internamento é <u>pouco</u> iluminada pela luz do sol.	0	1	2	3	4	N.A.
14.	A mobília (camas, armários, cómodas, cadeiras, mesas, etc.) está em más condições.	0	1	2	3	4	N.A.
15.	As janelas têm vidros grandes.	0	1	2	3	4	N.A.
16.	As paredes, os pavimentos e os tectos têm um aspecto <u>pouco</u> agradável.	0	1	2	3	4	N.A.
17.	A intensidade da luz artificial é satisfatória.	0	1	2	3	4	N.A.
18.	Das janelas vêem-se espaços verdes.	0	1	2	3	4	N.A.
19.	Os quartos são suficientemente grandes.	0	1	2	3	4	N.A.
20.	Há poucas casas de banho.	0	1	2	3	4	N.A.
21.	Das janelas tem-se uma vista <u>pouco</u> interessante.	0	1	2	3	4	N.A.
22.	O número de camas por quarto é adequado.	0	1	2	3	4	N.A.
23.	As janelas estão <u>pouco</u> limpas.	0	1	2	3	4	N.A.
24.	Neste serviço há espaços com aspecto agradável onde os doentes se podem encontrar com as visitas.	0	1	2	3	4	N.A.
25.	A mobília (camas, armários, cómodas, cadeiras, mesas, etc.) é de boa qualidade.	0	1	2	3	4	N.A.
26.	Há <u>falta</u> de espaço nos armários para os doentes.	0	1	2	3	4	N.A.
27.	Devia haver mais janelas.	0	1	2	3	4	N.A.
28.	As paredes, os pavimentos e os tectos têm cores bonitas.	0	1	2	3	4	N.A.
29.	A temperatura é <u>pouco</u> adequada (está demasiado quente ou demasiado frio).	0	1	2	3	4	N.A.
30.	As paredes, os pavimentos e os tectos estão bem cuidados.	0	1	2	3	4	N.A.

0	1	2	3	4	N.A.					
DISCORDO TOTALMENTE	DISCORDO EM PARTE	NEM CONCORDO NEM DISCORDO	CONCORDO EM PARTE	CONCORDO TOTALMENTE	Não se aplica					
31.	As salas de espera para as visitas têm um aspecto agradável.				0	1	2	3	4	N.A.
32.	Sente-se a <u>falta</u> de um espaço ao ar livre (terraço ou jardim) onde seja possível sentar e encontrar outras pessoas.				0	1	2	3	4	N.A.
33.	As casas de banho são <u>pouco</u> confortáveis.				0	1	2	3	4	N.A.
34.	Há <u>pouco</u> espaço nas cómodas para os doentes colocarem os seus bens pessoais.				0	1	2	3	4	N.A.
35.	A mobília (camas, armários, cómodas, cadeiras, mesas, etc.) tem um aspecto <u>pouco</u> agradável.				0	1	2	3	4	N.A.
36.	Há suficiente troca de ar com o exterior.				0	1	2	3	4	N.A.
37.	As casas de banho são demasiado pequenas.				0	1	2	3	4	N.A.
38.	Os lugares para sentar são <u>pouco</u> cómodos.				0	1	2	3	4	N.A.
39.	Neste serviço <u>faltam</u> salas de espera ou de convívio bem equipadas (cadeiras, mesas, TV, etc.).				0	1	2	3	4	N.A.
40.	As casas de banho têm um aspecto agradável.				0	1	2	3	4	N.A.
41.	O nível de humidade do ar é adequado (nem demasiado húmido, nem demasiado seco).				0	1	2	3	4	N.A.
42.	As paredes, os pavimentos e os tectos estão em más condições.				0	1	2	3	4	N.A.
43.	O ar é irrespirável.				0	1	2	3	4	N.A.
44.	A mobília (camas, armários, cómodas, cadeiras, mesas, etc.) está em boas condições.				0	1	2	3	4	N.A.
45.	Esta área de internamento está claramente delimitada.				0	1	2	3	4	N.A.

3.2.1. De um modo geral, como classifica a qualidade do espaço físico deste serviço hospitalar e, em particular, da área de internamento?

Péssima qualidade	0	1	2	3	4	5	6	7	8	9	10	Excelente qualidade
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PARTE 4

Foque agora a sua atenção nos ASPECTOS SOCIAIS E FUNCIONAIS DESTE SERVIÇO.

Concorda que...?

0	1	2	3	4	N.A.
DISCORDO TOTALMENTE	DISCORDO EM PARTE	NEM CONCORDO NEM DISCORDO	CONCORDO EM PARTE	CONCORDO TOTALMENTE	Não se aplica

1.	Neste serviço as pessoas recebem um bom acolhimento por parte dos profissionais de saúde.				0	1	2	3	4	N.A.
2.	Em geral, o pessoal de enfermagem está <u>pouco</u> disponível do ponto de vista humano.				0	1	2	3	4	N.A.
3.	As consultas médicas são conduzidas de forma satisfatória para o doente.				0	1	2	3	4	N.A.
4.	Em geral, os médicos dão <u>poucas</u> informações sobre os				0	1	2	3	4	N.A.

exames, os tratamentos e as intervenções necessárias.						
5. Há um bom clima de colaboração entre os profissionais de saúde.	0	1	2	3	4	N.A.
6. Em geral, o pessoal médico está <u>pouco</u> disponível do ponto de vista humano.	0	1	2	3	4	N.A.
7. Este serviço é <u>pouco</u> organizado.	0	1	2	3	4	N.A.
8. Neste serviço há regras demasiado rígidas que limitam as pessoas.	0	1	2	3	4	N.A.
9. É fácil entender a quem nos devemos dirigir para saber as informações que precisamos.	0	1	2	3	4	N.A.
10. É fácil os doentes identificarem o nome, apelido e função dos profissionais de saúde.	0	1	2	3	4	N.A.
11. É possível falar de coisas delicadas com os profissionais de saúde sem que os outros oiçam.	0	1	2	3	4	N.A.
12. As salas deste serviço estão frequentemente apinhadas de gente.	0	1	2	3	4	N.A.
13. Neste serviço tem-se a impressão de se estar a ser observado(a).	0	1	2	3	4	N.A.
14. Em geral, as pessoas são <u>pouco</u> intronetidas.	0	1	2	3	4	N.A.
15. Os doentes podem criar um espaço pessoal próprio.	0	1	2	3	4	N.A.
16. As pessoas criam muitos mexericos.	0	1	2	3	4	N.A.
17. Em geral, o pessoal auxiliar está <u>pouco</u> disponível do ponto de vista humano.	0	1	2	3	4	N.A.

4.1. De um modo geral, como classifica a qualidade do atendimento e funcionamento deste serviço?												
Péssima qualidade	0	1	2	3	4	5	6	7	8	9	10	Excelente qualidade

PARTE 5

INFORMAÇÕES SOBRE A SUA EXPERIÊNCIA DE TRABALHO EM HOSPITAIS

1. Há quanto tempo trabalha neste serviço? _____ anos

2. Já alguma vez trabalhou noutro hospital ou serviço hospitalar?

3. Sim

4. Não

2.1. Se sim,

2.1.1. Em quantos? _____

2.1.2. Comparado com as condições físicas do ambiente dos serviços hospitalares onde trabalhou anteriormente, este serviço tem condições físico-espaciais:

Muito piores 0 1 2 3 4 **5** 6 7 8 9 10 Muito melhores

3. Actualmente trabalha ou trabalhou anteriormente em algum hospital privado?

1. Sim

2. Não

PARTE 6

INFORMAÇÕES PESSOAIS

1. Idade:

_____ anos

2. Sexo

1. Feminino
2. Masculino

3. Estado civil:

1. Solteiro(a)
2. Casado(a) / Coabitação / União de facto
3. Outro. Qual?

4. Tem filhos?

1. Sim 4.1. Se sim, quantos? ____ filhos.
2. Não

5. Contando consigo, qual o número de pessoas que compõem o seu agregado familiar (as pessoas que vivem consigo na sua residência habitual)?

_____ pessoas.

6. Qual é o seu grau de escolaridade?

1. 1.º Ciclo do ensino básico (4ª classe)
2. 2º Ciclo do ensino básico (6º ano)
3. 3º Ciclo do ensino básico (9º ano ou 5º ano antigo liceu).....
4. 12º Ano ou 7º ano do antigo liceu
5. Licenciatura
6. Mestrado.....
7. Doutoramento

7. Como definiria o nível sócio-económico do seu núcleo familiar?

BAIXO	MÉDIO-BAIXO	MÉDIO-ALTO	ALTO
1	2	3	4

8. Qual é o nível de rendimento bruto do seu agregado familiar?

1. Menos de 400 euros por mês.....
2. De 401 a 800 euros por mês
3. De 801 a 1600 euros por mês.....
4. De 1601 a 2400 euros por mês.....
5. Mais de 2400 euros por mês.....
-1. Não sabe

Por favor verifique se respondeu a todas as perguntas.

**Muito obrigado pelo tempo que despendeu para colaborar neste estudo.
Deixe os seus comentários ou sugestões no verso desta página.**

Appendix D

Observation Grid for experts' assessment (Study 1 & Study 2)

GRELHA DE OBSERVAÇÃO E AVALIAÇÃO DO AMBIENTE HOSPITALAR

Instruções

A seguinte escala de avaliação foca-se numa série de características ambientais e elementos físicos do espaço hospitalar e está dividida em 3 secções, sendo que cada uma abrange uma parte específica do ambiente hospitalar:

- 1) a área exterior do hospital, ou seja, a área ao ar livre desde a entrada do hospital até aos edifícios com diversas funções;
- 2) o serviço de ortopedia, em geral (de internamento ou consulta)
- 3) a área específica do serviço (área de internamento ou área de espera)

Referindo-se ao seu conhecimento e especialização no domínio da construção e concepção arquitectónica, por favor marque com uma cruz a sua avaliação da qualidade do hospital em causa, para cada elemento desta grelha, de acordo com a seguinte escala:

Insuficiente	Pobre	Satisfatório	Bom	Excelente
0	1	2	3	4

Em alguns dos itens é pedido que especifique os critérios usados para a avaliação.

ESPAÇO EXTERIOR

3	Integração no tecido urbano	0	1	2	3	4
	Volumetria? Implantação? Escala? Proporção?					
	ESTÉTICA DO EDIFÍCIO					
13	Qualidade das construções (materiais de construção, formas, cores, estilo, etc.)	0	1	2	3	4
	Qual o estilo de construção hospitalar? Quais os materiais de construção? Os materiais de construção são de qualidade? Que cores têm os edifícios?					
	ORIENTAÇÃO					
8	Organização dos percursos	0	1	2	3	4
11	Organização espacial para a orientação (detectabilidade de rotas)	0	1	2	3	4
12	Presença de pontos de referência reconhecíveis	0	1	2	3	4
22	Organização e configuração do espaço	0	1	2	3	4
	Os percursos são óbvios, contínuos e claros? A paisagem e os caminhos guiam as pessoas para a entrada?					
10	Sinalização para a orientação	0	1	2	3	4
	O sistema de sinais para orientação é adequado? <ul style="list-style-type: none"> ◦ Todos os serviços estão sinalizados? ◦ Os sinais e seu conteúdo são grandes o suficiente? ◦ Os sinais têm materiais qualidade e estão bem mantidos? ◦ Sistema de símbolos é consistente em termos de estilo, cores, formas e fundo? ◦ Os sinais usam símbolos, pictogramas e palavras? ◦ Os sinais estão visíveis? 					
	MANUTENÇÃO E CUIDADO					
1	Reconhecimento da área de entrada do hospital.	0	1	2	3	4
	Quantas entradas principais existem? As entradas estão posicionadas de forma lógica e óbvia, claramente visíveis? A forma e a organização dos edifícios favorecem a aproximação e a entrada de pessoas? Os materiais são distintos e de qualidade?					

2	Acessibilidade da zona de entrada (ausência de barreiras arquitectónicas) do hospital	0	1	2	3	4
4	Facilidade dos percursos a pé	0	1	2	3	4
5	Habilitação do espaço para cadeiras de rodas e carrinhos de bebé	0	1	2	3	4
	<p>O tipo de pavimento é adequado à circulação de todas as pessoas, incluindo pessoas com mobilidade reduzida?</p> <p>Não há barreiras arquitectónicas?</p> <p>Há separação entre a circulação de carros e pessoas a pé?</p> <p>Os caminhos são largos?</p>					
9	Manutenção dos percursos	0	1	2	3	4
	<p>Os pavimentos estão em bom estado?</p> <p>Os caminhos estão limpos?</p> <p>Há caixotes do lixo?</p> <p>Os caixotes do lixo estão limpos?</p>					
14	Manutenção dos edifícios	0	1	2	3	4
	<p>Os edifícios estão limpos e cuidados?</p> <p>Os materiais mantêm a boa aparência dos edifícios?</p>					
6	Presença e funcionalidade dos corrimões	0	1	2	3	4
	ACESSOS					
	ESPAÇOS VERDES					
7	Presença e facilidade no estacionamento	0	1	2	3	4
	<p>Quantos lugares de estacionamento há disponíveis?</p> <p>A que distância?</p> <p>A que distância está a paragem de transportes públicos mais próxima (autocarros, metro, comboio, táxis)? Qual é?</p> <p>Há transportes públicos com regularidade?</p>					
15	Presença de áreas equipadas para paragem (descanso?) e para socialização	0	1	2	3	4
16	Qualidade das áreas equipadas para paragem	0	1	2	3	4
17	Manutenção das áreas equipadas para paragem	0	1	2	3	4
18	Presença de elementos ornamentais (fontes, estátuas, plantas, etc.)	0	1	2	3	4
19	Presença de áreas verdes	0	1	2	3	4
20	Qualidade das áreas verdes	0	1	2	3	4

21	Possibilidade de desfrutar de áreas verdes	0	1	2	3	4
	Qual a área de espaço verde disponível? As áreas verdes estão bem cuidadas? Qual o número de árvores? Há cafetarias ou quiosques na área exterior? Há bancos de jardim? Estão presentes elementos ornamentais?					
23	Saúde ambiental (ausência de substâncias e de emissões poluentes)	0	1	2	3	4
24	Segurança do ambiente	0	1	2	3	4

SERVIÇO EM GERAL

(DE INTERNAMENTO/ DE CONSULTA)

12	Largura dos corredores	0	1	2	3	4
	Qual o tamanho das portas de acesso aos diferentes espaços? Há espaço para manobrar camas e cadeiras de rodas?					
13	Facilidade de percurso nos corredores (sem obstáculos, como macas, máquinas, etc.)	0	1	2	3	4
14	Presença e funcionalidade dos corrimões	0	1	2	3	4
2	Acessibilidade da zona de entrada (ausência de barreiras arquitectónicas)	0	1	2	3	4
1	Reconhecimento da zona de entrada.	0	1	2	3	4
	A entrada está posicionada de forma lógica e óbvia, tem-se dela uma visão clara à entrada, está claramente reconhecível?					
4	Reconhecimento do balcão da recepção (forma particular, tecto, iluminação)	0	1	2	3	4
	Os materiais, elementos decorativos, cor e luz tornam a recepção distinta? A recepção está bem identificada e sinalizada?					
5	Posicionamento do balcão da recepção	0	1	2	3	4
	A recepção está posicionada de forma lógica e óbvia, tem-se dela uma visão clara e imediata?					
6	Sinalização para a orientação	0	1	2	3	4
	O sistema de sinais para orientação é adequado? ° Todos os locais estão sinalizados?					

	<ul style="list-style-type: none"> ° Os sinais estão bem localizados, visíveis mesmo com as portas abertas? ° Os sinais e seu conteúdo são grandes o suficiente? ° Os sinais têm materiais qualidade? ° O sistema de símbolos é consistente em termos de estilo, cores, formas e fundo? ° Os sinais usam símbolos, pictogramas e palavras? 						
8	Clareza das indicações (símbolos, marcas, etc.)	0	1	2	3	4	
	<p>As indicações são claras?</p> <p>Os sinais usam termos compreensíveis, adequados ao nível de leitura do 6º ano?</p>						
7	Organização espacial para a orientação (detectabilidade de rotas)	0	1	2	3	4	
9	Linearidade e clareza na disposição de espaço	0	1	2	3	4	
10	Presença de pontos de referência reconhecíveis	0	1	2	3	4	
11	Diferenciação dos elementos físicos (mobiliário, cores, luzes), nas várias áreas	0	1	2	3	4	
	<p>O espaço está bem organizado? É fácil de detectar a sua organização?</p> <p>Os percursos são óbvios, contínuos e claros?</p>						
3	Carácter acolhedor do mobiliário da recepção	0	1	2	3	4	
	<p>A recepção está limpa?</p> <p>A recepção está arrumada?</p> <p>A recepção tem elementos decorativos ou de arte (ex: flores, quadros)?</p> <p>O balcão tem altura suficiente para atender pessoas em cadeiras de rodas (76-83 cm de altura)?</p> <p>A recepção destaca-se por ter materiais, cores, luz diferente?</p> <p>*. Carácter acolhedor da entrada do serviço</p> <p>A entrada é espaçosa?</p> <p>O interior é luminoso e arejado (uso de cores, materiais, luz artificial e natural, tectos mais altos, combinados com áreas envidraçadas)?</p> <p>...</p>						
18	Manutenção das janelas	0	1	2	3	4	
	As janelas estão limpas?						
	<p>*. Manutenção dos materiais</p> <p>O chão está limpo?</p> <p>A mobília está limpa?</p> <p>A casa de banho está limpa?</p> <p>No geral, o espaço parece limpo? Os materiais são fáceis de limpar?</p>						
15	Iluminação artificial	0	1	2	3	4	
	<ul style="list-style-type: none"> ° Tom da luz? ...etc. ° A luz artificial pode ser regulada pelos doentes e profissionais? 						

	<ul style="list-style-type: none"> ◦ Há luz para leitura disponível acima e perto da cama? ◦ A luz da enfermaria não incomoda os pacientes que tentam descansar? 					
16	Iluminação natural	0	1	2	3	4
	<ul style="list-style-type: none"> ◦ Quantas janelas há no quarto? [in escala da área específica] ◦ Qual o tamanho das janelas? [in escala da área específica] ◦ A luz natural é indirecta e suave? ◦ Todos os pacientes são expostos a luz natural? ◦ A luz solar pode ser regulada pelos doentes e profissionais? 					
17	Qualidade das janelas (caixilharias, vidraças, etc.)	0	1	2	3	4
19	Vista sobre espaço aberto	0	1	2	3	4
	<p>Das janelas, vê-se o céu e o chão?</p> <p>Que vista se tem através das janelas?</p>					
20	Vista sobre o espaço verde	0	1	2	3	4
	<p>Das janelas vê-se espaço verde? De que tipo?</p> <p>+</p> <p>A vista tem algum grau de mudança e imprevisibilidade, movimento humano ou de aspectos da natureza?</p> <p>Todos os doentes têm acesso à janela?</p>					
21	Qualidade dos pavimentos (materiais, cores, manutenção, etc.)	0	1	2	3	4
	<p>Materiais:</p> <p>Cores:</p> <p>Manutenção:</p> <ul style="list-style-type: none"> ◦ Bem cuidado? ◦ Boas condições? ◦ Aspecto agradável? 					
22	Qualidade do tecto (materiais, cores, manutenção, etc.)	0	1	2	3	4
	<p>Materiais:</p> <p>Cores:</p> <p>Manutenção:</p> <ul style="list-style-type: none"> ◦ Bem cuidado? ◦ Boas condições? ◦ Aspecto agradável? 					
23	Qualidade das paredes (materiais, cores, manutenção, etc.)	0	1	2	3	4
	<p>Materiais:</p> <p>Cores:</p> <p>Manutenção:</p> <ul style="list-style-type: none"> ◦ Bem cuidado? 					

	<ul style="list-style-type: none"> ◦ Boas condições? ◦ Aspecto agradável? 					
24	Manutenção dos pavimentos, tectos e paredes	0	1	2	3	4
25	Integração da arquitectura, materiais, cores, mobiliário e iluminação	0	1	2	3	4
26	Presença de elementos decorativos (fotografias, cartazes, esculturas, plantas, flores, ornamentos decorativos, etc.)	0	1	2	3	4
	De que tipo? Onde?					
28	Saúde ambiental (ausência de substâncias poluentes e de emissões)	0	1	2	3	4
29	Segurança do ambiente	0	1	2	3	4
	Ruído Ouve-se ruído vindo do exterior? Por que motivos? Há ruído dentro do serviço?					

ÁREA DE INTERNAMENTO

2	Clareza e linearidade na disposição do espaço	0	1	2	3	4
4	Delimitação, diferenciação e caracterização das áreas de internamento e das áreas de trabalho	0	1	2	3	4
6	Não invasão do espaço pelos equipamentos médicos	0	1	2	3	4
8	Não fragmentação do ambiente em termos de materiais, cores e acabamentos	0	1	2	3	4
9	Demarcação e diferenciação das áreas de espera e de encontro para pacientes e visitas	0	1	2	3	4
	Há uma sala de espera para as visitas? Há uma sala de espera própria para os doentes receberem as visitas?					
10	Presença de áreas de encontro equipadas (com cadeiras, revistas, televisão, etc.)	0	1	2	3	4
	Há uma sala de convívio disponível?					
11	Qualidade áreas de encontro (materiais, cores, iluminação, móveis, ornamentos decorativos, etc.)	0	1	2	3	4
	Esses espaços estão bem equipados?					

	<ul style="list-style-type: none"> ◦ Televisão? ◦ Telefone público? ◦ Internet? ◦ Snacks e bebidas? ◦ Revistas? ◦ Relógio? 					
12	Proximidade de um espaço ao ar livre (terraço ou jardim) equipado para promover a sociabilização	0	1	2	3	4
	Há um espaço ao ar livre próximo e acessível? Qual?					
13	Tamanho do quarto (em comparação com o número de camas)	0	1	2	3	4
	Qual a área dos quartos? Número de camas por quarto (com determinada área)					
14	Espaço entre as camas	0	1	2	3	4
15	Proximidade das outras áreas funcionais da unidade	0	1	2	3	4
16	Acesso fácil dos quartos (enfermarias) às salas de tratamento (ou salas de operações)	0	1	2	3	4
17	Controlo visual dos quartos (enfermarias) a partir das salas de tratamento (ou salas de operações)	0	1	2	3	4
18	Acesso fácil de instalações sanitárias a partir das camas dos pacientes.	0	1	2	3	4
19	Qualidade das instalações sanitárias (materiais, cores, funcionalidade, facilidade e comodidade de utilização, etc.)	0	1	2	3	4
	Quantas casas de banho? Qual a área das casas de banho? É fácil manobrar cadeiras de rodas? É fácil aceder ao chuveiro, lavatório, sanita? Que elementos a casa de banho contém (funcionalidades)? Que cores têm? De que materiais é composta?					
22	Tamanho das janelas	0	1	2	3	4
23	Número de janelas	0	1	2	3	4
32	Conforto do mobiliário (cadeiras, mesas, armários, etc.)	0	1	2	3	4
33	Qualidade do mobiliário (materiais, formas, cores, estilo)	0	1	2	3	4
	Cadeiras ◦ Materiais:					

	<ul style="list-style-type: none"> ◦ Formas: ◦ Cores: ◦ Estilo: <p>Têm detalhes de qualidade, são confortáveis?</p> <p>São estáveis e seguras?</p> <p>Acomodam crianças, grávidas, pessoas fortes, idosas ou pessoas fisicamente debilitadas?</p> <p>Têm apoio das costas e braços?</p> <p>Estão em boas condições?</p> <p>Têm um aspecto agradável?</p>					
	<p>Armários</p> <ul style="list-style-type: none"> ◦ Materiais: ◦ Formas: ◦ Cores: ◦ Estilo: <p>Estão localizados em zonas onde a circulação não está impedida?</p> <p>Podem ser facilmente abertos e fechados por pessoas com destreza limitada?</p> <p>Estão em boas condições?</p> <p>Têm um aspecto agradável?</p> <p>Os armários são espaçosos?</p>					
	<p>Mesinhas de cabeceira</p> <ul style="list-style-type: none"> ◦ Materiais: ◦ Formas: ◦ Cores: ◦ Estilo: <p>Podem ser ajustadas a várias alturas por pacientes com artrite ou destreza limitada?</p> <p>Podem ser movidas facilmente para se aceder aquilo que tem na superfície?</p> <p>Têm gavetas que abrem e fecham facilmente?</p> <p>São estáveis?</p> <p>Podem servir de superfície para escrever?</p> <p>As mesinhas de cabeceira são espaçosas?</p>					
	<p>Camas</p> <ul style="list-style-type: none"> ◦ Materiais: ◦ Formas: ◦ Cores: ◦ Estilo: <p>A sua altura pode ser facilmente ajustada?</p> <p>Estão em boas condições?</p> <p>Têm um aspecto agradável?</p>					
34	Manutenção do mobiliário	0	1	2	3	4
35	Presença de elementos decorativos (fotografias, cartazes, esculturas, plantas, flores,	0	1	2	3	4

	ornamentos decorativos, etc.) - nos quartos? - nos restantes espaços do serviço?					
36	Integração da arquitectura, materiais, cores, mobiliário e iluminação	0	1	2	3	4
37	Presença de elementos com carácter hoteleiro	0	1	2	3	4
38	Sistema de ventilação	0	1	2	3	4
	As janelas podem ser abertas ou fechadas? Todas? "Cheira a hospital"?					
39	Sistema de regulação térmica	0	1	2	3	4
	A que temperatura está o espaço? A temperatura pode ser regulada?					

ÁREA DE ESPERA (DO SERVIÇO DE CONSULTA)

1	Delimitação, diferenciação e caracterização da área de espera	0	1	2	3	4
	O percurso da sala de espera para os gabinetes é óbvio e não ambíguo, rápido e discreto? A sala de espera está fisicamente separada da área dos gabinetes? Há diferentes áreas de espera? Por exemplo, área para crianças?					
2	Tamanho da área de espera	0	1	2	3	4
	Qual a área da sala de espera? Qual o arranjo dos lugares?					
5	Número de lugares para sentar	0	1	2	3	4
3	Carácter acolhedor do mobiliário	0	1	2	3	4
4	Elementos/ recursos da sala de espera (cadeiras, revistas, televisão, etc.)	0	1	2	3	4
	◦ Televisão? ◦ Telefone público? ◦ Internet? ◦ Snacks e bebidas? ◦ Revistas? ◦ Relógio?					

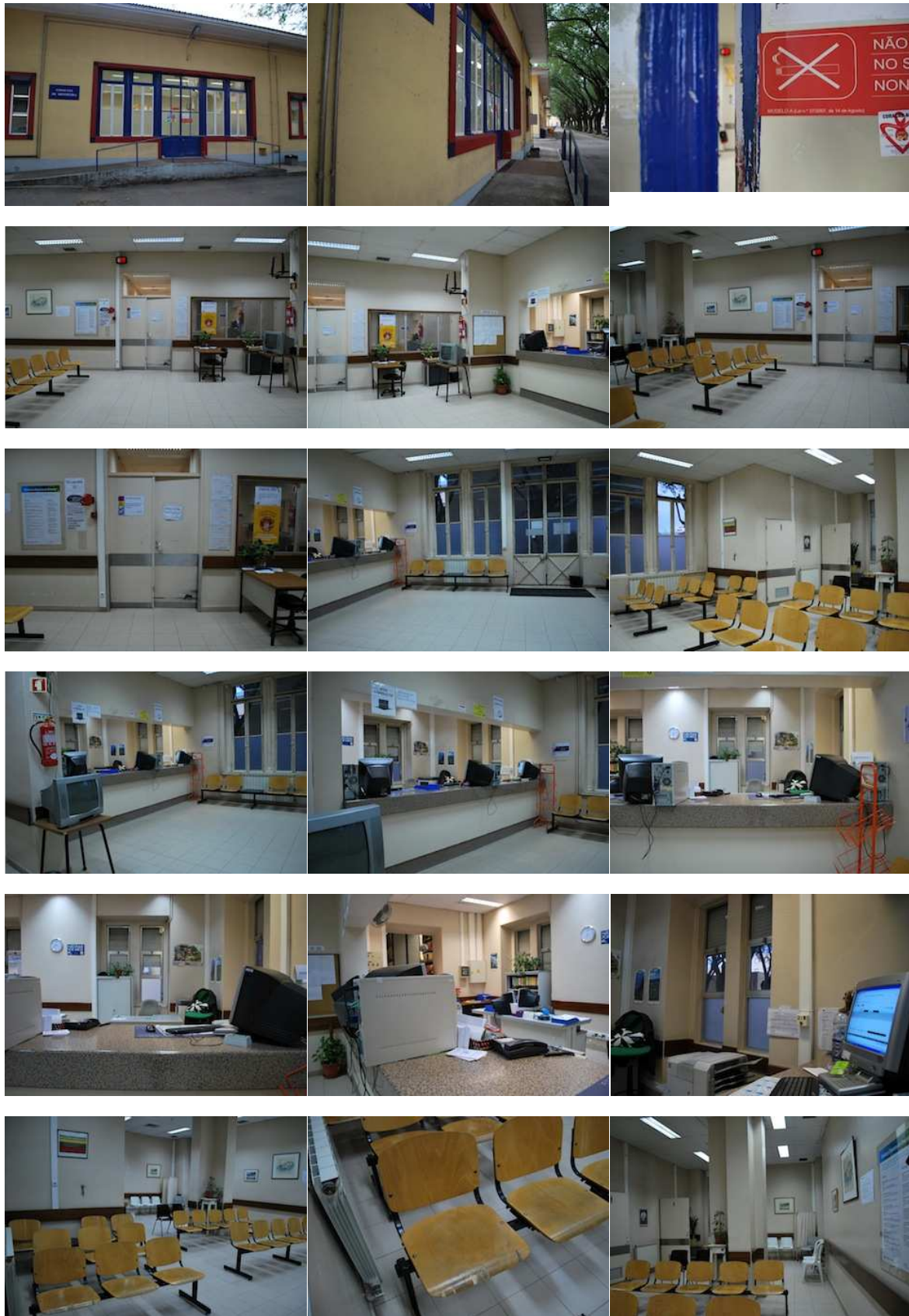
8	Tamanho das janelas	0	1	2	3	4
9	Número das janelas	0	1	2	3	4
18	Conforto do mobiliário (cadeiras, mesas, etc.)	0	1	2	3	4
	Cadeiras <ul style="list-style-type: none"> ◦ Materiais: ◦ Formas: ◦ Cores: ◦ Estilo: Têm detalhes de qualidade, são confortáveis? São estáveis e seguras? Acomodam crianças, grávidas, pessoas fortes, idosas ou pessoas fisicamente debilitadas? Têm apoio das costas e braços? Estão em boas condições? Têm um aspecto agradável?					
19	Qualidade do mobiliário (materiais, formas, cores, estilo)	0	1	2	3	4
20	Manutenção de mobiliário	0	1	2	3	4
21	Integração da arquitectura, materiais, cores, mobiliário e iluminação	0	1	2	3	4
22	Presença de elementos decorativos (fotografias, cartazes, esculturas, plantas, flores, ornamentos decorativos, etc.)	0	1	2	3	4
23	Sistema de ventilação	0	1	2	3	4
24	Sistema de regulação térmica	0	1	2	3	4

Appendix E

Materials: Photographs

(Study 3 & Study 4)

Inadequate Hospital Area





Neutral Hospital Area





Good Hospital Area





Appendix F

Materials: Stories

Study 3 & Study 4

NEUTRAL STORY

In Portuguese

A Maria dirigiu-se ao serviço de consulta de ortopedia do hospital da sua zona de residência por causa de uma tendinite na mão direita.

Chegou ao serviço alguns minutos antes da hora marcada. Imediatamente reconheceu onde deveria tirar a senha para a inscrição e pagamento da consulta.

A Maria tirou uma senha para si. Havia pessoas na sala de espera. A Maria esperou que chegasse a sua vez. Passado algum tempo a sua vez chegou. A Maria dirigiu-se ao balcão da recepção, onde foi atendida.

No fim da inscrição a Maria sentou-se à espera.

Após algum tempo foi chamada através do intercomunicador. Quando se dirigia para a zona dos gabinetes de consulta passou por uma auxiliar do serviço.

A médica estava à espera da Maria.

No final da consulta, entregou-lhe as receitas e credenciais e pediu-lhe que se dirigisse ao gabinete de enfermagem para colocar uma tala.

A Maria dirigiu-se ao gabinete de enfermagem, onde o enfermeiro lhe colocou uma tala.

Antes de se ir embora, a Maria dirigiu-se ao balcão para se inscrever em consultas de fisioterapia.

Finalmente, a Maria dirigiu-se para a saída.

In English

Maria went to the orthopedic clinic of the hospital in her residential area for a consultation because of tendinitis in her right hand.

She arrived at the clinic a few minutes before her scheduled appointment. She immediately recognized where she should take a numbered ticket for the registration and payment of the consultation.

Maria took a numbered ticket. There were people in the waiting room. Maria waited for her turn. After some time her turn came. Maria went to the reception desk, where she was registered.

At the end of the registration Maria sat down to wait.

After some time she was called through the intercom. When she was going to the area where the consultations took place she passed by a member of the custodial staff.

The doctor was waiting for Maria.

At the end of the consultation, the doctor gave Maria the prescriptions and orders and told her to go to the nursing office to have the nurse put on a splint.

Maria went to the nursing office where the nurse put on a splint for her hand.

Before leaving, Maria went to the reception desk to make an appointment for physiotherapy sessions.

Finally, Maria headed for the exit.

NEGATIVE STORY

In Portuguese

A Maria dirigiu-se ao serviço de consulta de ortopedia do hospital da sua zona de residência por causa de uma tendinite na mão direita.

Chegou ao serviço alguns minutos antes da hora marcada. Imediatamente reconheceu onde deveria tirar a senha para a inscrição e pagamento da consulta. O sistema estava avariado, pelo que os doentes eram chamados oralmente pelo funcionário da recepção, que dizia em voz alta o número seguinte. A Maria tirou uma senha para si.

Estavam muitas pessoas na sala de espera. A Maria não encontrou um lugar livre, pelo que ficou de pé enquanto esperava que chegasse a sua vez. Passado algum tempo a sua vez chegou.

Quando a Maria chegou ao balcão notou que não havia nenhuma placa indicando o nome do funcionário da recepção. O funcionário pediu-lhe o seu cartão de saúde sem a cumprimentar. Entretanto, a Maria informou que estava ali para uma consulta com a Dra. Paula e, enquanto falava, reparou que o funcionário estava a ouvi-la com pouca atenção.

Em seguida, esta disse à Maria que ia buscar o seu processo. Passado algum tempo regressa dizendo que não encontra o processo e que quando o encontrar irá entregá-lo à médica, antes da consulta. A Maria perguntou-lhe também como se marcava uma consulta de fisioterapia. O funcionário, não estabelecendo contacto ocular, disse que não sabia e que esse assunto era tratado por outro colega, noutra balcão, com outra senha. Durante a conversa o funcionário não a tratou pelo nome. No fim da inscrição a Maria perguntou qual o tempo de espera estimado e o funcionário disse apenas que ela tinha de esperar.

A Maria sentou-se à espera. Enquanto isso ouviu pessoas comentarem algo sobre um doente que tinha acabado de sair. Após algum tempo foi chamada através do intercomunicador. A Maria teve dificuldades em perceber o seu nome mas dirigiu-se à zona dos gabinetes de consulta. Um auxiliar do serviço recebeu a Maria e, sem a cumprimentar, apontou o gabinete ao fundo do corredor.

A médica estava à espera da Maria. Sentado, pediu-lhe que entrasse e que se sentasse. Enquanto a Maria explicou o que a trazia à consulta, a médica foi escrevendo no computador, pouco atento. Em seguida, a médica respondeu com pouco cuidado às questões e preocupações da Maria e apenas explicou de forma rápida aquilo que ela devia fazer. A médica não referiu nada acerca da evolução do problema, mas recomendou sessões de fisioterapia. No final, entregou-lhe as receitas e credenciais e pediu-lhe que se dirigisse à enfermaria para colocar uma tala. A médica permaneceu sentado, despediu-se e chamou o próximo doente pelo intercomunicador.

A Maria dirigiu-se ao gabinete de enfermagem. O enfermeiro colocou a tala quase sem falar com ela. Antes de se ir embora, a Maria dirigiu-se ao balcão onde lhe disseram que se faziam as inscrições para as consultas de fisioterapia. A administrativa informou que só havia vagas para o próximo mês pelo que teria de voltar lá a partir do dia 1, para se inscrever.

Finalmente, a Maria dirigiu-se para a saída.

In English

Maria went to the orthopedic clinic of the hospital in her residential area for a consultation because of tendinitis in her right hand.

She arrived at the clinic a few minutes before her scheduled appointment . She immediately recognized where she should take a numbered ticket for the registration and payment of the consultation. The number display system was broken, so patients were called by the staff at the reception desk, who called the numbers out loud. Maria took a numbered ticket from the staff. There were a lot of people in the waiting room. Maria couldn't find a free space, so she stood up while waiting for her turn. After some time her turn came.

When Maria arrived at the reception desk she noticed that there was no sign indicating the name of the administrative assistant in the reception area. The administrative assistant asked Maria for her health card without greeting her. Meanwhile, Maria said that she was there for a consultation with Dr. Paula. As she spoke, she noticed that the administrative assistant listened to her paying little attention.

Then, the administrative assistant said he was going to get Maria's file. After a while he came back saying that he could not find her file and that when he found it he would deliver it to the doctor before the consultation. Maria asked how she could make an appointment for physiotherapy. Not establishing eye contact, the administrative assistant said he didn't know and that the matter was handled by another colleague, at another desk, with another numbered ticket. During the conversation the administrative assistant did not refer to Maria by her name. At the end of the registration Maria asked the estimated waiting time and the administrative assistant said that she just had to wait.

Maria sat down to wait. Meanwhile she heard people commenting about a patient that had just left. After some time she was called through the intercom. Maria had difficulty hearing her name but she went to the area of where the consultations took place. Without greeting her, a staff member pointed Maria to the office down the hall.

The doctor was waiting for Maria. She got up, opened the door, asked her to come in, and to sit down.

As Maria explained what brought her to the clinic for a consultation, the doctor was typing on the computer, paying little attention. Then the doctor answered Maria's questions and concerns with little

care and just quickly explained what she should do. The doctor did not mention anything about the prognosis of the problem. In the end, the doctor gave Maria the prescriptions and orders and told her to go to the nursing office to have a nurse put on a splint. The doctor stayed seated, said goodbye, and called the next patient by intercom.

Maria went to the nursing office. The nurse put on the splint without talking to her. Before leaving, Maria went to the reception desk where she was told she could make an appointment for physiotherapy sessions. The administrative assistant informed Maria that there were no more appointments available for the current month, so she would need to return there the following day to make an appointment for the following month.

Finally, Maria headed for the exit.

POSITIVE STORY

In Portuguese

A Maria dirigiu-se ao serviço de consulta de ortopedia do hospital da sua zona de residência por causa de uma tendinite na mão direita.

Chegou ao serviço alguns minutos antes da hora marcada.

Estavam poucas pessoas na sala de espera. Imediatamente reconheceu o balcão onde deveria inscrever-se e pagar a consulta.

Quando a Maria chegou ao balcão o assistente da recepção cumprimentou-a cordialmente, tratando-a pelo nome, e pediu-lhe por favor o seu cartão de saúde.

A Maria entregou-lhe o seu cartão, notando que havia uma placa indicando o nome do assistente, e informou-o que estava ali para uma consulta com a ortopedista Dra. Paula Loureiro.

Além disso, pediu-lhe também informação sobre os tratamentos de fisioterapia.

O assistente escutou-a atentamente e deu-lhe a informação pretendida. No final pediu-lhe aguardasse um instante pois a médica ia já atendê-la, perguntando-lhe ainda se queria tomar alguma coisa enquanto aguardava um momento. A Maria agradeceu e dirigiu-se à zona de espera.

Sentou-se por uns instantes e logo a seguir foi chamada por uma auxiliar do serviço, que a cumprimentou e acompanhou até ao gabinete da médica.

A médica estava à espera da Maria. Levantou-se, abriu a porta, pediu-lhe que fizesse o favor de se sentar e perguntou como se sentia. Enquanto a Maria explicou o que a trazia à consulta, a médica olhava para ela, atenta. Em seguida, a médica respondeu com cuidado às questões e preocupações da Maria e explicou devagar e de forma clara os cuidados que ela deveria ter.

A médica consultou no computador o processo da Maria e foi registando os detalhes acerca do caso. A Dra. Paula falou-lhe acerca da evolução do problema e recomendou sessões de fisioterapia. No final, entregou-lhe as receitas e credenciais e, por telefone, chamou ao seu gabinete um enfermeiro. Quando este chegou ao gabinete cumprimentou ambas e a médica explicou-lhe que gostaria que ele fizesse uma massagem com uma pomada anti-inflamatória na mão da Maria.

A doutora levantou-se, despediu-se da Maria e desejou-lhe as melhoras.

O enfermeiro acompanhou a Maria ao gabinete de enfermagem para lhe fazer o tratamento. Enquanto isso foi amavelmente conversando com ela.

No final, o enfermeiro acompanhou-a até à porta do gabinete.

Antes de se ir embora, a Maria dirigiu-se ao balcão onde lhe tinham indicado que se faziam as inscrições para os tratamentos de fisioterapia. A primeira sessão ficou marcada logo para o dia seguinte de manhã.

Finalmente, a Maria dirigiu-se para a saída.

In English

Maria went to the orthopedic clinic of the hospital in her residential area for a consultation because of tendinitis in her right hand.

She arrived at the service a few minutes before her scheduled appointment.

There were few people in the waiting room. She immediately recognized the reception desk where she should register and pay for the consultation. When Maria arrived at the reception desk, the assistant in the reception area cordially greeted her, calling her by her name, and asked politely for her health card.

Maria gave him her card, noticing that there was a sign indicating the name of the reception assistant, and informed the assistant she was there for a consultation with the orthopedist Dr. Paula.

Moreover, she asked for information about the physiotherapy treatments.

The assistant listened to Maria carefully and gave her the information she needed. In the end, he asked if Maria wanted a beverage while she waited for a moment because the physician was going to “attend” to her in a little while. Maria thanked the assistant and sat down to wait.

She sat for just a few moments and right away she was called by a staff member, who greeted her and accompanied her to the doctor’s office.

The doctor was waiting for Maria. She got up, opened the door, asked Maria to come in, to sit down, and asked her how she was feeling. As Maria explained what brought her for the consultation, the doctor was looking at her, attentively. Then the doctor carefully answered the questions and concerns Maria had, and explained slowly and carefully what Maria should do.

The doctor consulted the Maria’s file in the computer and registered the details of Maria’s case. Dr. Paula talked about the prognosis of the problem and recommended physiotherapy sessions. In the end, she gave Maria the prescriptions and orders and, by phone, called a nurse to her office. When he arrived he greeted

them both, and the doctor explained that she would like him to do a massage on Maria's hand with an anti-inflammatory cream.

The doctor stood up, said goodbye to Maria, and wished her a speedy recovery.

The nurse accompanied Maria to the nursing office to do her treatment. Meanwhile he kindly talked with her.

In the end, he accompanied her to the door.

Before leaving, Maria went to the reception desk where she was told she could make an appointment for physiotherapy sessions. The first session was scheduled for the next day.

Finally, Maria headed for the exit.

Appendix G

Pre-test of the Photographs

(Study 3 & Study 4)

Imagine que a Maria vai a um serviço de consulta de um hospital.

Veja atentamente as fotografias desse serviço. [FOTOS]

Gostaríamos agora de saber qual pensa que terá sido a impressão da Maria a respeito deste serviço hospitalar. Por favor, assinale a sua resposta.

1. De um modo geral, como acha que a Maria classificaria a qualidade do espaço físico deste serviço hospitalar e, em particular, da sala de espera?

Péssima qualidade 0 1 2 3 4 5 6 7 8 9 10 Excelente qualidade

2. Usando uma escala de concordância, diga-nos o que acha que a Maria terá pensado acerca dos seguintes aspectos:

0	1	2	3	4
DISCORDA TOTALMENTE	DISCORDA EM PARTE	NEM CONCORDA NEM DISCORDA	CONCORDA EM PARTE	CONCORDA TOTALMENTE

A entrada deste serviço é claramente reconhecível.	0	1	2	3	4
Ouve-se frequentemente barulho proveniente do exterior.	0	1	2	3	4
A sinalética permite encontrar facilmente aquilo que se procura.	0	1	2	3	4
Os locais onde se pedem informações estão claramente reconhecíveis.	0	1	2	3	4
Ouvem-se <u>poucos</u> ruídos do exterior.	0	1	2	3	4
Há <u>poucos</u> sinais para orientação.	0	1	2	3	4
A sala de espera é <u>pouco</u> iluminada pela luz do sol.	0	1	2	3	4
A mobília está em más condições.	0	1	2	3	4
Das janelas tem-se uma vista <u>pouco</u> interessante.	0	1	2	3	4
A mobília é de boa qualidade.	0	1	2	3	4
Devia haver mais janelas.	0	1	2	3	4
As paredes, os pavimentos e os tectos têm cores bonitas.	0	1	2	3	4
Os lugares sentados são <u>pouco</u> cómodos.	0	1	2	3	4
As paredes, os pavimentos e os tectos estão em más condições.	0	1	2	3	4
A mobília está em boas condições.	0	1	2	3	4

3. Considerando o ambiente físico deste serviço, qual pensa que será o nível de satisfação geral da Maria?

Nenhuma satisfação 0 1 2 3 4 5 6 7 8 9 10 Muitíssima satisfação

Idade: __

Sexo: F/M

Confirme que respondeu a todas as questões.

Envie por favor as suas respostas para claudiarcandrade@gmail.com.

Obrigada mais uma vez pela sua colaboração.

Appendix H

Pre-test of the Stories

(Study 3 & Study 4)

Leia atentamente a experiência da Maria durante uma visita ao serviço de consulta de um hospital. Imagine a Maria na seguinte situação:

[História Negativa/ Neutra/ Positiva]

Gostaríamos de saber a sua opinião sobre qual terá sido a impressão da Maria a respeito desta visita hospitalar.

Usando uma escala de concordância, diga-nos o que acha que a Maria terá pensado acerca dos seguintes aspectos:

0	1	2	3	4
DISCORDA TOTALMENTE	DISCORDA EM PARTE	NEM CONCORDA NEM DISCORDA	CONCORDA EM PARTE	CONCORDA TOTALMENTE

Neste serviço as pessoas recebem um bom acolhimento por parte dos profissionais de saúde.	0	1	2	3	4
Em geral, o pessoal de enfermagem está <u>pouco</u> disponível do ponto de vista humano.	0	1	2	3	4
Em geral, o pessoal médico está <u>pouco</u> disponível do ponto de vista humano.	0	1	2	3	4
Este serviço é <u>pouco</u> organizado.	0	1	2	3	4
Neste serviço há regras demasiado rígidas que limitam as pessoas.	0	1	2	3	4
As salas deste serviço estão frequentemente apinhadas de gente.	0	1	2	3	4
Neste serviço tem-se a impressão de se estar a ser observado(a).	0	1	2	3	4
As pessoas criam muitos mexericos.	0	1	2	3	4
Em geral, o pessoal auxiliar está <u>pouco</u> disponível do ponto de vista humano.	0	1	2	3	4

10. Considerando a experiência global da Maria neste serviço, em geral, qual pensa que será o seu nível de satisfação?

Nenhuma satisfação	0	1	2	3	4	5	6	7	8	9	10	Muitíssima satisfação
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Idade: __

Sexo: F/M

Confirme que respondeu a todas as questões.

Obrigada mais uma vez pela sua colaboração

Appendix I

Instructions & Measures

(Study 3)

Only Photographs

1	<p>Bem-vindo!</p> <p>Antes de começar o estudo por favor certifique-se que tem o telemóvel em silêncio. Por favor leia todas as instruções com atenção e mantenha-se atento e concentrado durante o estudo.</p> <p>PRESSIONE A TECLA DE ESPAÇOS PARA COMEÇAR A LER AS INSTRUÇÕES</p>
2	<p>Este estudo tem como objectivo estudar o modo como formamos impressões sobre pessoas e espaços a partir de diferentes tipos de informação.</p> <p>Imagine que um indivíduo hipotético - a Maria - se dirige a um serviço de consulta de ortopedia por causa de uma tendinite na mão direita.</p> <p>Serão apresentadas automaticamente no monitor várias fotografias desse serviço hospitalar. O que lhe pedimos é que, ao mesmo tempo que vê as fotografias, tente imaginar a situação pela qual a Maria passou naquele local.</p> <p>PRESSIONE A TECLA DE ESPAÇOS PARA CONTINUAR A LER AS INSTRUÇÕES</p>
3	<p>Por favor preste atenção às fotografias.</p> <p>No fim vamos fazer-lhe perguntas sobre esta situação hipotética.</p> <p>Caso tenha alguma dúvida, pode chamar o experimentador.</p> <p>Se não tiver dúvidas, PRESSIONE A TECLA DE ESPAÇOS PARA COMEÇAR</p>
(...)	[FOTOGRAFIAS]
4	<p>De seguida vamos perguntar-lhe a sua opinião sobre a situação pela qual a Maria passou neste serviço hospitalar.</p> <p>Assim, serão apresentadas uma série de perguntas no monitor, uma de cada vez. Em baixo de cada questão existe uma escala numérica que deve utilizar para dar a sua resposta. Para isso utilize as teclas numéricas da parte superior do teclado.</p> <p>Caso não tenha dúvidas,</p> <p>PRESSIONE A TECLA DE ESPAÇOS PARA CONTINUAR</p>
5	<p>Para responder às questões seguintes imagine o que a Maria terá pensado e sentido a respeito desta visita hospitalar.</p> <p>PRESSIONE A TECLA DE ESPAÇOS PARA COMEÇAR A RESPONDER</p>
6	Considerando a experiência global da Maria neste serviço, em geral, qual acredita que será o seu nível de satisfação?
7	Até que ponto imagina que este Serviço de Ortopedia corresponde às expectativas da Maria?
8	Até que ponto imagina que este Serviço de Ortopedia responde às necessidades da Maria?
9	Imagine um Serviço de Ortopedia perfeito em todos os aspectos. A que distância pensa a Maria que este Serviço de Ortopedia está?
10	Como acredita que a Maria se estará a sentir naquele momento?
11	Como acredita que a Maria se estará a sentir naquele momento?
12	Como acredita que a Maria se estará a sentir naquele momento?
13	<p>Para responder às questões que se seguem imagine o que a Maria terá pensado acerca dos aspectos relacionados com o atendimento e funcionamento do serviço.</p> <p>PRESSIONE A TECLA DE ESPAÇOS PARA COMEÇAR A RESPONDER</p>
-	Usando a escala de concordância em baixo, diga-nos o que acha (pressionando a tecla numérica correspondente) que a Maria terá pensado acerca do seguinte aspecto relacionado com o atendimento e funcionamento do serviço:
14	Neste serviço as pessoas recebem um bom acolhimento por parte dos profissionais de saúde.
15	Em geral, o pessoal de enfermagem está POUCO disponível do ponto de vista humano
16	Em geral, o pessoal médico está POUCO disponível do ponto de vista humano.
17	Este serviço é POUCO organizado.
18	Neste serviço há regras demasiado rígidas que limitam as pessoas.
19	As salas deste serviço estão frequentemente apinhadas de gente.
20	Neste serviço tem-se a impressão de se estar a ser observado.
21	As pessoas criam muitos mexericos.
22	Em geral, o pessoal auxiliar está POUCO disponível do ponto de vista humano.
23	<p>Para responder às questões que se seguem imagine o que a Maria terá pensado acerca dos aspectos relacionados com o ambiente físico do serviço.</p> <p>PRESSIONE A TECLA DE ESPAÇOS PARA COMEÇAR A RESPONDER</p>
-	Usando a escala de concordância em baixo, diga-nos o que acha (pressionando a tecla numérica correspondente) que a Maria terá pensado acerca do seguinte aspecto relacionado com o ambiente

	físico do serviço:
24	A entrada deste serviço é claramente reconhecível.
25	Ouve-se frequentemente barulho proveniente do exterior.
26	A sinalética permite encontrar facilmente aquilo que se procura.
27	Os locais onde se pedem informações estão claramente reconhecíveis.
28	Ouvem-se POUCOS ruídos do exterior.
29	Há POUCOS sinais para orientação.
30	A sala de espera é POUCO iluminada pela luz do sol.
31	A mobília está em más condições.
32	Das janelas tem-se uma vista POUCO interessante.
33	A mobília é de boa qualidade.
34	Devia haver mais janelas.
35	As paredes, os pavimentos e os tectos têm cores bonitas.
36	Os lugares sentados são POUCO cómodos.
37	As paredes, os pavimentos e os tectos estão em más condições.
38	A mobília está em boas condições.
39	Para finalizar queremos apenas perguntar-lhe acerca do seu conhecimento pessoal sobre o serviço hospitalar apresentado nas imagens. PRESSIONE A TECLA DE ESPAÇOS PARA RESPONDER
40	Até que ponto este hospital lhe é familiar?
41	Já alguma vez esteve neste hospital?
42	Terminou o estudo. Obrigado pela sua participação. Pode chamar o experimentador.

Only Story

1	Bem-vindo! Antes de começar o estudo por favor certifique-se que tem o telemóvel em silêncio. Por favor leia todas as instruções com atenção e mantenha-se atento e concentrado durante o estudo. PRESSIONE A TECLA DE ESPAÇOS PARA COMEÇAR A LER AS INSTRUÇÕES
2	Este estudo tem como objectivo estudar o modo como formamos impressões sobre pessoas e espaços a partir de diferentes tipos de informação. Imagine que um indivíduo hipotético - a Maria - se dirige a um serviço de consulta de ortopedia por causa de uma tendinite na mão direita. Irá ouvir uma história que conta a experiência da Maria nesse serviço hospitalar. O que lhe pedimos é que, ao mesmo tempo que ouve a história, tente imaginar a situação pela qual a Maria passou naquele local. PRESSIONE A TECLA DE ESPAÇOS PARA CONTINUAR A LER AS INSTRUÇÕES
3	Por favor preste atenção à história. No fim vamos fazer-lhe perguntas sobre esta situação hipotética. Caso tenha alguma dúvida, pode chamar o experimentador. Se não tiver dúvidas, coloque os auscultadores que estão junto do computador e PRESSIONE A TECLA DE ESPAÇOS PARA COMEÇAR
(...)	[HISTÓRIA] Preste atenção à história. Quando a história terminar pressione a tecla de espaços
4	De seguida vamos perguntar-lhe a sua opinião sobre a situação pela qual a Maria passou neste serviço hospitalar. Assim, serão apresentadas uma série de perguntas no monitor, uma de cada vez. Em baixo de cada questão existe uma escala numérica que deve utilizar para dar a sua resposta. Para isso utilize as teclas numéricas da parte superior do teclado. Caso não tenha dúvidas PRESSIONE A TECLA DE ESPAÇOS PARA CONTINUAR
5	Para responder às questões seguintes imagine o que a Maria terá pensado e sentido a respeito desta visita hospitalar. PRESSIONE A TECLA DE ESPAÇOS PARA COMEÇAR A RESPONDER

6	Considerando a experiência global da Maria neste serviço, em geral, qual acredita que será o seu nível de satisfação?
7	Até que ponto imagina que este Serviço de Ortopedia corresponde às expectativas da Maria?
8	Até que ponto imagina que este Serviço de Ortopedia responde às necessidades da Maria?
9	Imagine um Serviço de Ortopedia perfeito em todos os aspectos. A que distância pensa a Maria que este Serviço de Ortopedia está?
10	Como acredita que a Maria se estará a sentir naquele momento?
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13	Para responder às questões que se seguem imagine o que a Maria terá pensado acerca dos aspectos relacionados com o atendimento e funcionamento do serviço. PRESSIONE A TECLA DE ESPAÇOS PARA COMEÇAR A RESPONDER
-	Usando a escala de concordância em baixo, diga-nos o que acha (pressionando a tecla numérica correspondente) que a Maria terá pensado acerca do seguinte aspecto relacionado com o atendimento e funcionamento do serviço:
14	Neste serviço as pessoas recebem um bom acolhimento por parte dos profissionais de saúde.
15	Em geral, o pessoal de enfermagem está POUCO disponível do ponto de vista humano
16	Em geral, o pessoal médico está POUCO disponível do ponto de vista humano.
17	Este serviço é POUCO organizado.
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19	As salas deste serviço estão frequentemente apinhadas de gente.
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-	Usando a escala de concordância em baixo, diga-nos o que acha (pressionando a tecla numérica correspondente) que a Maria terá pensado acerca do seguinte aspecto relacionado com o ambiente físico do serviço:
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Appendix J

Instructions & Measures

(Study 4)

1	Bem-vindo! Antes de começar o estudo por favor certifique-se que tem o telemóvel em silêncio. Por favor leia todas as instruções com atenção e mantenha-se atento e concentrado durante o estudo. PRESSIONE A TECLA DE ESPAÇOS PARA COMEÇAR A LER AS INSTRUÇÕES
2	Este estudo tem como objectivo estudar o modo como formamos impressões sobre pessoas e espaços a partir de diferentes tipos de informação. Assim, neste estudo irá ouvir a gravação de uma história que conta a experiência da Maria num serviço hospitalar. Ao mesmo tempo que ouve a história, serão apresentadas automaticamente no monitor várias fotografias do serviço hospitalar onde a situação aconteceu. O que lhe pedimos é que, ao mesmo tempo que ouve a história e vê as fotografias, tente imaginar a situação pela qual a Maria passou naquele local. PRESSIONE A TECLA DE ESPAÇOS PARA CONTINUAR A LER AS INSTRUÇÕES
3	Por favor preste atenção à história e às imagens. No fim vamos fazer-lhe perguntas sobre ambas. Caso tenha alguma dúvida, pode chamar o experimentador. Se não tiver dúvidas, coloque agora os auscultadores que se encontram junto do computador e PRESSIONE A TECLA DE ESPAÇOS PARA COMEÇAR
(...)	[FOTOGRAFIAS & HISTÓRIA]
4	De seguida vamos perguntar-lhe a sua opinião sobre a situação pela qual a Maria passou neste serviço hospitalar. Assim, serão apresentadas uma série de perguntas no monitor, uma de cada vez. Em baixo de cada questão existe uma escala numérica que deve utilizar para dar a sua resposta. Para isso utilize as teclas numéricas da parte superior do teclado. Caso não tenha dúvidas PRESSIONE A TECLA DE ESPAÇOS PARA CONTINUAR
5	Para responder às questões seguintes imagine o que a Maria terá pensado e sentido a respeito desta visita hospitalar. PRESSIONE A TECLA DE ESPAÇOS PARA COMEÇAR A RESPONDER
6	Considerando a experiência global da Maria neste serviço, em geral, qual acredita que será o seu nível de satisfação?
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	Usando a escala de concordância em baixo, diga-nos o que acha (pressionando a tecla numérica correspondente) que a Maria terá pensado acerca do seguinte aspecto relacionado com o atendimento e funcionamento do serviço:
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	Usando a escala de concordância em baixo, diga-nos o que acha (pressionando a tecla numérica correspondente) que a Maria terá pensado acerca do seguinte aspecto relacionado com o ambiente físico do serviço:

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40	Até que ponto este hospital lhe é familiar?
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42	Terminou o estudo. Obrigado pela sua participação. Pode chamar o experimentador.