

The impact of healthcare waiting environment design on end-user perception and well-being

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Abstract— Traditionally, the design of healthcare environments has not always included much end-user involvement. In order to create better built-environments in future, it is important to understand the perception of the people for who the design is intended.

This study seeks to gain a better understanding of how people from the general public perceive the design of healthcare waiting environments. Within a healthcare setting, the design of waiting environments plays an important role in serving as one of the first interaction points between users and the environment. Furthermore, it is challenged with the accommodation of multiple user groups and their diverse needs.

Twenty-four in-depth interviews were conducted with users using a semi-structured format with stimuli in the form of color photographs of different waiting room designs. Interviews were audio-recorded, transcribed and their content analyzed. The data reveals how people talk about environmental concepts and the impact of the designs on their feelings to describe the waiting room designs. The perceived impact of the design of healthcare waiting environments is expressed through three categories - emotive, cognitive and associative responses.

The findings provide an understanding of the language that people use to describe healthcare waiting room designs and their impact on them. This knowledge will benefit architects, designers and the healthcare community as it helps them appreciate and incorporate end-user perspective into their future work.

Keywords- End-user participation, waiting room, hospital design, perception, well-being

I. INTRODUCTION

The body of evidence and research interest in the relationship between built-environment and end-user outcomes has grown rapidly in recent years [1, 2]. In a healthcare setting, the design of waiting environments play an important role in shaping end-user impressions and experiences of the overall setting and service. This is especially true in the service industry where individuals often interact mostly or firstly with the environment [3-6].

The design of healthcare waiting environments often reflects the individual style of healthcare decision-makers, designers and architects. Individual style derives mainly from choices made and the order of methods used during the design

process [7]. A study conducted by researchers from the Design Council UK also reported that each organization and project may follow a different design process [8]. The design process is therefore not always clearly defined. However, regardless of the choice of design process, for the creation of better healthcare environments, it is important to understand the perception of the people for whom the design is intended.

The main end-users of healthcare waiting environments are patients, including their friends and family as well as healthcare employees. Studies have found that changing the design of the environment with the patient in mind can positively influence patient outcome [9]. Environment design can also have an impact on staff satisfaction and their performance [10]. In 2005, the Commission for Architecture and the Built Environment (CABE) reported that 24% of all staff satisfaction rates are related to environmental factors such as comfort, air quality, temperature, noise, lighting and office layout [11].

Designing for end-users could therefore have potential value in the design process. This study seeks to explore the general public's language and rationale behind the description and judgment of healthcare waiting environment design.

II. METHOD

A. Sample

Twenty-four participants (N=24, 12 males, 12 females) were selected based on convenience sampling. Participants from the general public were recruited, primarily within The University of Warwick and their referrals. The inclusion criteria were minimum age of 18 years old and not suffering from any uncorrected visual impairment. Participants' age ranged from 18 to 64 following a normal distribution with the largest group (79%) being between 25 and 44.

TABLE I. PARTICIPANTS' AGE AND GENDER

	Count		Total
	Male	Female	
Age group	18 to 24	0	1
	25 to 44	10	19
	45 to 64	2	4
Total	12	12	24

Even though not all age groups of healthcare users are included such as children and teenagers below 18 and the elderly above 64 years old, the sample is serving the exploratory purpose of the study. The general public represents past, existing and/or future end-users of healthcare environments.

The majority of participants were users of the National Health Service (NHS) in the UK. 54.2% of all participants mostly visit primary care whereas 16.7% have most frequently been to secondary care and 8.3% stated to have used both types of services provided by the NHS. 12.5% of all participants stated that they have used a combination of private and NHS or public healthcare service abroad whereas only 8.3% haven't only been to private healthcare. This information is to help interpret the data as well as detecting possible outliers.

B. Data Collection

The data collection was carried out over a four month – period from February to May 2011. The duration of the experiment ranged between 40 and 90 minutes depending on the individuals.

After a briefing, participants were given sixty-five color images displaying a range of possible designs in healthcare waiting areas. Visual material was used to stimulate participants' emotional response, as it is an established method to represent a real life environment [12]. Several selection criteria such as the absence of people and animals, similar picture quality and size were applied in order to minimize bias and normalize the images. They were asked to sort the images into similar groups based on their own concept of similarity following adapted sorting instructions from Scott and Canter [13]. This exercise helped participants to familiarize themselves with the images and the topic as well as to express themselves during the interview. Participants were also encouraged to picture themselves going to the healthcare environments shown on the picture for a routine check-up. This brief was to ensure that everybody had the same context in mind when carrying out the task.

Participants were encouraged to share their perceptions verbally during the sort or once the task was completed. A semi-structured interview technique using broad topic areas as guiding questions to facilitate open-ended conversations was used. All interviews were audio-recorded for transcription. The topic areas included the following

- Experience of healthcare environments
- Interaction with the environments
- Preference of designs
- (Dis-) similarity of designs
- Idea of an ideal healthcare waiting environment

A short questionnaire to capture the main profile data from participants was also handed out at the end of the interview sessions.

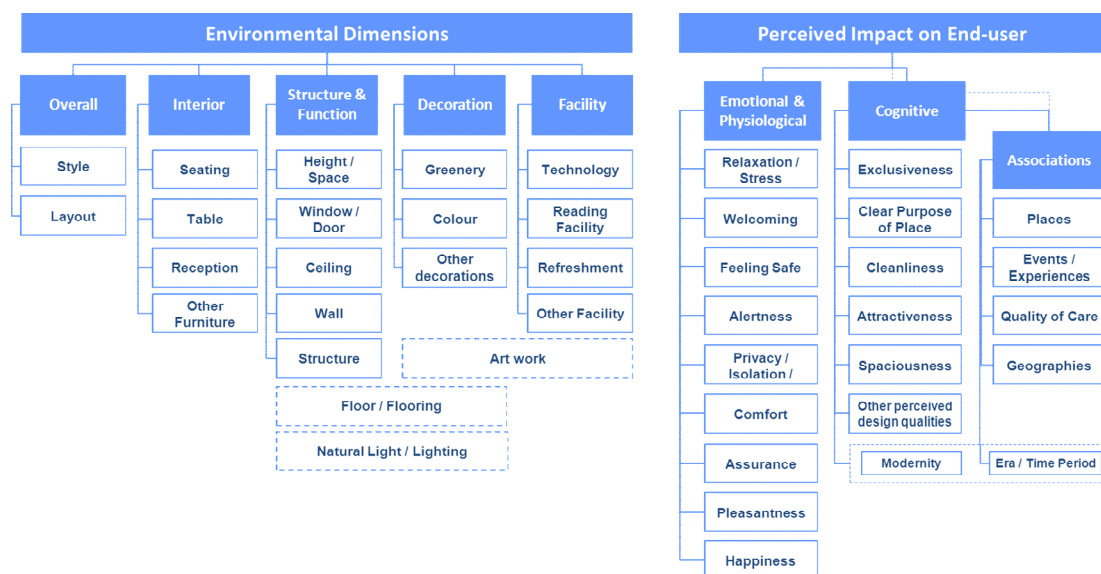
C. Data Analysis

All available recordings from participants who agreed for the interviews to be audio-taped were transcribed. Interview transcripts were content analyzed using open and axial coding techniques [14]. The coding task was performed several times until the main themes representing the body of the interview contents were identified. This step of the analysis is called thematic analysis. All qualitative data analysis was carried out using the software QSR NVivo8™ and its updated version NVivo10™. Descriptive statistics were performed on participants' socio-demographic data using IBM SPSS 19.

III. FINDINGS

The data revealed that people mainly talk about environmental concepts and the impact of the designs on their feelings to describe the waiting room designs. An overview of these findings is shown in Chart I below.

CHART I – OVERVIEW OF FINDINGS



1) Environmental Dimensions

People talked about physical and non-physical attributes of design. Physical attributes include all visible elements of the space such as the structure, interior, decorative elements. Non-physical attributes refer to services that are linked to the physical design such as entertainment and hygiene facilities.

Examples of semantics related to environmental dimensions used by participants including their word counts are listed in Chart II below.

Only words that directly describe the environment and their synonyms are included in the count since many words can only be interpreted in context. The most frequently mentioned words in this category are related to seats (341 counts), followed by light / lighting (144 counts) and the descriptors of space and height (127 counts).

2) Perceived Impact of the Design on End-Users

The perceived impact of the design of healthcare waiting environments is expressed through three main categories - emotive, cognitive and associative responses. The emotional dimension focuses on how the design makes them feel whereas the cognitive responses bring out their evaluation of the perceived design quality. Associative responses refer to places or events people have experienced in the past which are used to compare and form a perception of the other designs. Strictly speaking, association is a sub-category of cognitive response due to its nature of recalling past memories in order to arrive at a judgment. However, due to its dominant presence in the data and for clarity purpose, it is clustered as a separate category.

2.1. Emotional and Physiological Impact

2.1.1 Relaxation, Calmness and Privacy

People often wondered whether they “would feel ok sitting and waiting there” when looking at the images or before making any judgment over the design. The majority of

participants have expressed that a quiet, intimate place can make them feel relaxed e.g. “I quite like this one, less stressful, kind of tucked away on my own. I quite like the way these are pointing away. Almost like a little world I can retreat into”.

“I don’t particularly like to sit next to someone else, quite like a bit of privacy”.

Contradictory to this, three participants expressed the desire to connect and engage with others during the waiting experience.

“People who sit down are forced to look straight ahead and sit side by side rather than facing each other in any kind of nice atmosphere, where they feel they could engage with each other”.

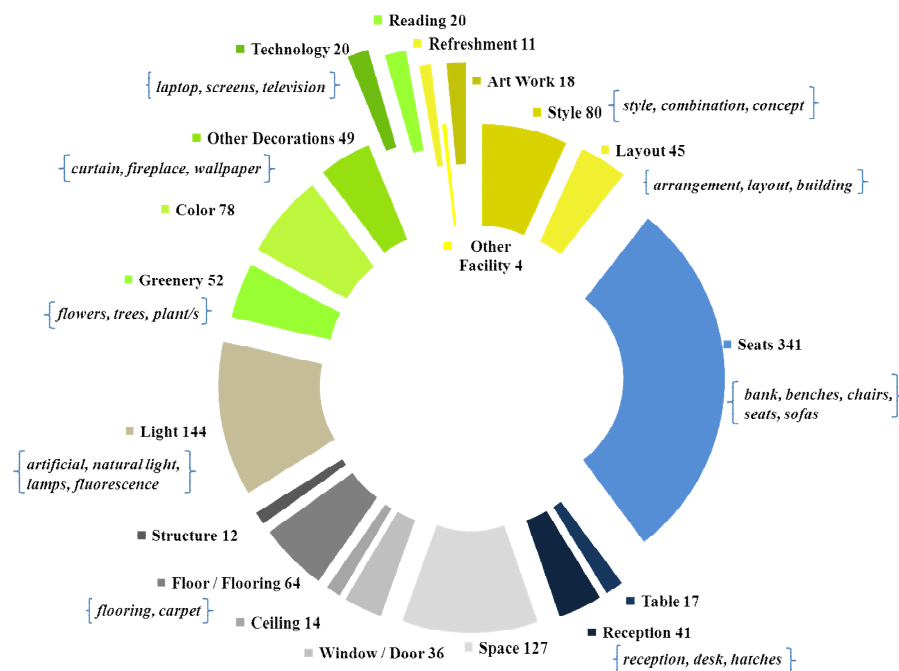
“I think in a HC setting, especially when you are already stressed out, when you go there to see a doctor. It can be stressful for people. And it’s important that you have different levels where if you feel like you can share if that helps, you should be able to do that.”

One participant also emphasized that the degree of relaxation can be influenced by the arrangement and layout of furniture. “You know how I said I really imagine myself being there, so how much I like them depends on how relaxed I’d feel. I’d feel more relaxed in a less structured environment.”

Being able to relax is often mentioned in the context of “knowing what’s going on”. Finding your way around and being informed about the procedure is an important aspect of the waiting experience.

“At the same time, I am never sure what’s happening, who is going to call me, when, and from where, so I like to see as much of the place as possible. Because hospitals can be a very confusing place where you don’t know where to go and you feel a bit intimidated and staff seems to assume that you know what’s happening next but you don’t.”

CHART II – ENVIRONMENTAL DIMENSIONS



2.1.2 Comfort – Physical and Psychological Comfort

When speaking about comfort, people can refer to the physical comfort due to the material of furnishings such as:

“And that one I don’t know; may be it looks more attractive but it looks very stark, there are no soft textures at all, so the seats don’t look comfortable”.

In other cases, the distinction of physical and psychological comfort is made *“This whole bunch (of designs) there is basically: you just go there and wait. There are some chairs that are comfortable but most of them you don’t feel comfortable”.*

2.1.3 Facilities, Distraction and the Waiting Experience

While the aspect of having privacy and quietness appears to be important, some people also mentioned the aspect of being bored while waiting. They would like to be able to do something useful instead of *“wasting time by just waiting”*. A few reported that they take personal reading material along *“Well, I have been waiting a lot of times. I normally bring a book a long, so that’s what I do”* while others like to have some distraction when being there *“being able to look outside is a beautiful thing”*. The presence of a TV and music / radio as a distraction or entertainment received mixed responses, the majority leaning towards rejecting it as one participant describes *“...there was that loud music in the background and it couldn’t have been more inappropriate”*.

However, others stated that going to a healthcare waiting environment is expected to be an unpleasant experience and that waiting is all you do.

“It fits much in your schemata of what a waiting room is - it’s very plain; you just wait there for your appointment. No one particular likes going to an appointment. It doesn’t add any extra pleasant experience to the whole, the experience going as it were”.

2.2. Cognitive Impact

2.2.1 Modernity Exclusiveness and Attractiveness

Participants appeared to feel the strong urge to make voluntary judgments about the environment and to share their views. The design was often evaluated by their general state and degree of exclusiveness which was expressed through terms such as *luxurious, fancy, posh, run-down, cheap and tacky*.

A few participants evaluated exclusiveness of the design in combination with the judgment of how modern and fashionable it appeared. Words frequently used for this were *stylish, funky, modern, old-fashioned and dated*.

2.2.2 Assurance and Understanding the Environment

Often people make up their idea about the overall design by questioning whether the purpose of the place was obvious and if they were there, whether they would be confident about knowing what to do.

“I am not really sure what’s going on there. On the walls, I assume that’s projection of something which is a nice idea in a

different room. ...the floor with cracks - It kind of looks like a warehouse that’s been painted. And what are they doing behind the curtain? Is that where you are going to see the doctor? Because if that’s the case, I wouldn’t like that, that’s far too open”.

2.2.3 Cleanliness

The evaluation was also made based on the degree of perceived cleanliness. Participants pointed out the importance of the material in relationship to contamination.

“Although it looks like a couch, it looks like one that could be cleaned if something went wrong.”

2.2.4 Other evaluated Design Qualities - Light and Space related to perceived Well-being

Participants also commented on other design qualities of the environment such as light and space with regard to their preference or their perceived well-being. A cramped place with not sufficient natural light or is too bright due to artificial lighting are usually not well-perceived.

“...they are very light and airy and I kind of would feel quite comfortable and probably quite relaxed having to go and wait in those areas there.” Or “They are quite dark, dark and gloomy which I always get the feel in a waiting room.”

2.2.5 Mixed Impact on End-users or a Combination of Design Elements

Often there is no clear cut-off point between emotion and cognitive perception of the design. A few participants noted that the combination of artifacts or their accumulative impacts are what really matters.

“It’s the use of space and light and knowing where to go when you first walk into the room and having distraction because of the anxiety.”

“The relaxed ones are the ones that have got windows or television screens and chairs that are not too close together”.

2.3. Association

2.3.1 Places - Healthcare Environments or other Public Spaces

In order to communicate their idea and perception of design concepts; participants very often make use of comparative examples describing places and events. This result in numerous types of other public places such as hotels, restaurants, airports or standard healthcare, General Practitioner (or family doctor), dentist etc. It can therefore be summarized that participants make the distinction between healthcare waiting environments that are associated with a clinical or non-clinical setting.

“...the general impression, that’s why I came up with those categories. That looks like a hotel; that looks like an office building; that looks like a typical healthcare building and that’s trying to look like a home. So I tend to see the overall design rather than look at the details”.

2.3.2 Events and Experiences

Events and experiences like “*being on holiday*” or “*reminds me of a funeral*” were often used to emphasize a strong positive or negative emotion about the environment. One participant pointed out that the positive experience associated with the design is more important than the actual physical environment.

“The way I look at it is when you go to a place where you don’t necessarily think that it’s beautiful but places like a student union, where you feel comfortable, feel at home (then it’s more relaxing).”

2.3.3 Perceived Quality of Service

Participants also speculated about the possible quality of service they will receive depending on the design style and quality. Even the ones that claimed not being “*the type who would make judgment about the medical service*” have revealed the opposite in further conversation.

“The nicer the environment, the nicer people might be. This one (pointing at a picture) with cold environment gives the impression that staff might be unfriendly, impatient”.

IV. DISCUSSION

A. Discussion on the Results

• Environmental Dimensions

Seats, light or lighting, space / height, floor or flooring and style were the environmental dimensions most frequently mentioned.

When speaking about seats, people often commented on their arrangement, perceived level of comfort and aesthetics. Seating might have been strongly in participants’ focus due to sitting and waiting being the biggest part of the waiting experience. This category is useful for learning about which design elements and their combination people notice, in order to pay more attention to certain design aspects. The attention to light, space and style may be due to its role of influencing the overall picture of the setting. Previous research has suggested that the ambience is influenced by these factors [5].

In general, it was found that people seldom speak about the design without linking it to its design consequence, whether it is with regard to their emotion or behavior. This is in line with Gestalt theory which suggests that people form their perception of the environment based on their symmetry, similarity, movement etc. [15].

• Perceived Impact of the Design on End-Users

Participants felt at ease using emotive words or made a judgment of the environment to describe the design and their ideas. They often offered voluntary possible explanations for the way the design made them feel or provided design ideas for improvement. Quality of service was for example, sometimes judged based upon the design. People find it difficult to relax and feel comfortable if the design quality of the space is not well-perceived. Previous research suggests that an aesthetic

artifact can be used as a cue for quality assessment [4] but also to enhance our emotion towards an environment [12, 16].

Even though decorative elements were mentioned as having an effect on people’s perception, the impact was not as strong and definite as suggested in previous findings [17, 18]. This may, however, be due to the visual representation technique where elements such as plants and entertainments may not be as dominant as in-situ.

Interior was strongly suggested to have multiple impacts on end-users such as the seating arrangement and privacy and comfort, height and position of the reception desk and welcoming atmosphere. This is in line with research showing that design elements such as color, layout and lighting are used to influence end-user impression of the environment [1, 2, 18, 19].

In general, people have expressed the desire of being able to relax which has also been suggested by Scott & Canter [13]. Participants have also expressed positive emotions towards places that are easy to understand and where they do not feel trapped or uninformed. Previous studies have shown that the inability of influencing or engaging with the environment is a major aspect of stress in a healthcare environment [17]. Dovey [20] suggests that being able to control and interact with the environment is a major aspect of feeling at home. The way people have used associative terms of places and events to describe their emotions are in line with previous research [21].

B. Discussion on the Approach - Visual Aid and People’s Participation

People are surprisingly motivated in sharing their views on the designs. The technique of using photographs to engage people in a card sorting task showed success in involving people and getting them well-prepared for the discussion. Photographs helped the researcher and participant discuss ideas with a specific visual concept in front of them. The disadvantage is that using too many pictures could be time-consuming and interviewees’ responses may be biased by the selection of designs provided. Another challenge of using images is that they may not reflect all aspects of the real life environment [13].

C. Future Research

The knowledge stemmed from this study and the review of relevant literature identifies three areas of research potential. First, the responses of end-users towards different types of design representation such as sketches, photographs, videos, 3d prototypes should be explored. Further research on how typical and non-typical healthcare designs impact on end-users is also needed. Apart from a few theoretical discussions, no further investigations have been made. Third, the improvement of healthcare design based on end-user experience.

V. CONCLUSION

The findings provide an understanding of the language and dimensions people use to describe the design of healthcare waiting rooms and how it impacts on their perception and their perceived well-being. This knowledge contributes to the

improvement of healthcare design recommendations by bringing in the end-user perspective. Architects, designers and the healthcare community will benefit from a better understanding of the end-user perspective when creating more user-friendly environments in future.

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