

**OBSERVING HEALTHCARE INTERIOR ENVIRONMENTS AND
THE EFFECT ON PATIENT BEHAVIOR**

A Senior Scholars Thesis

by

COURTNEY RAE RICE

Submitted to the Office of Undergraduate Research
Texas A&M University
in partial fulfillment of the requirements for the designation as

UNDERGRADUATE RESEARCH SCHOLAR

April 2010

Major: Environmental Design

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Approved by:

Research Advisor:
Associate Dean for Undergraduate Research:

Mark Clayton
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ABSTRACT

Observing Healthcare Interior Environments and the Effect on Patient Behavior.
(April 2010)

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Healthcare facilities are recognizable as organized, clean, and functional environments that enable health practices to be carried out easily. However, most healthcare facilities do not take into account how design may affect patient welfare. The aim of this research project was to observe the interior environments of healthcare facilities and study how the environment affects patient well-being. If interior environments have an effect on patients, then designing health-conscious interiors for healthcare facilities will be crucial and may result in patient well-being. Using Texas A&M University's Beutel Health Center as a sample and representation of a college healthcare facility, this research intended to discover the independent and dependent variables in the interior environments that have the greatest impact, whether positive or negative, on patients. The methods used to perform this research include: inspections of the facility, observations, and surveys. By combining all of these methods, the results possibly concluded a reliable database for making improvements to college healthcare facilities around the world. The main objectives included answering the following:

- I. How do patients feel about the interior environments of Beutel Health Center and what aspects influence this feeling?
- II. What are the independent and dependent variables present in the interior environment that effect patient well-being?

The results concluded that by adding simple elements to the interior environments of healthcare facilities, patient welfare is enhanced along with positive attitudes, opinions, and behaviors.

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CHAPTER I

INTRODUCTION

Background

Healthcare facilities are easily recognizable as organized, clean, and functional environments that enable health practices to be carried out easily. However, most healthcare facilities do not take into account how design may affect patient welfare. The literature that does exist on the knowledge of this topic is very broad and provides many different focuses and findings. Also, the research comes from a variety of fields and professions, whether it is psychology, engineering, or medicine, providing knowledge from leaders across all subject areas. Although research in healthcare environments is increasing and accumulating quickly, gaps still exist. This may be caused by the difficulty and challenges facing researching in healthcare facilities; however this makes it even more important to keep researching and promote awareness of this topic.

First of all, there must be a precise definition of health, healing, or a therapeutic environment in order to design this type of space. According to Thomas Egnew, “Themes of wholeness, narrative, and spirituality are congruent with the derivation of the term 'healing.' Heal means 'to make sound or whole' and stems from the root, haelan, the condition or state of being hal,

This thesis follows the style of *Environment and Behavior*.

whole. Hal is also the root of 'holy,' defined as 'spiritually pure' ” (Egnew, 2005).

An environment that can improve health outcomes, reduce stress, enhance social support, and provide positive distractions (McCormick & Shepley, 2003) defines a therapeutic environment. Another question that may be asked is: who are the occupants of these therapeutic environments? “Besides *researchers*, consumer groups include *intermediate consumers (design practitioners, clients, and policy-makers)* and *end consumers (staff, residents, families, and other end-users)*” (McCormick & Shepley, 2003).

The literature on healthcare design and healthcare environments tend to fall into these categories: sources of environmental satisfaction, evidence-based design, and challenges facing healthcare facility research.

Sources of environmental satisfaction

There are many aspects of healthcare environments that affect occupants’ behavior and perception of care. These aspects may be positive or negative. According to research, sources of environmental satisfaction have been classified as the ambient environment, architecture features, interior design features, and social features (Dijkstra, Pieterse, & Pruyn, 2006; Evans & McCoy, 1998; Harris, Curtis, McBride, & Ross, 2002; Schweitzer, Gilpin, & Frampton, 2004; Topf, 2000; Tsai et al., 2007; Ulrich, Zimring, Quan, & Joseph, 2004). Patients may have different perspectives on these topics depending on many variables including: patients’ beliefs,

opinions, expectations, and needs (Harris et al., 2002). These sources of environmental satisfaction are the characteristics that occupants of healthcare environments find important and produce either successful or unsuccessful environments.

Ambient environment

According to Harris (Harris et al., 2002), an ambient environment is described by its lighting, sound, and smell, in which these characteristics may cause patient satisfaction or dissatisfaction. Along with the type of satisfaction the ambient environment brings, it also provides a basis for reducing or inducing stress (Dijkstra et al., 2006; Harris et al., 2002; Heschong, 2002; Topf, 2000; Ulrich, 1991). It is important for designers to keep these features in mind when designing healthcare facilities in order to produce a design centered on the patients. “Design features that minimize these sources of stress or allow patients more control over the ambient environment (e.g., individual thermostats, dimmer switches) might enhance satisfaction for the hospital environment” (Harris, 2002 #2).

Architecture features

Architecture features are the second dimension of the sources of environmental satisfaction. The architecture of healthcare environments must be patient centered, allow some control and participation of the occupants, and contain coherence and privacy features (Dijkstra et al., 2006; Evans & McCoy, 1998; Schweitzer et al., 2004). Harris (Harris et al., 2002) defines architectural features as relatively permanent aspects of the hospital environment, which includes windows, wayfinding, and the spatial layout. These aspects have been suggested to be

important, as “changes in the physical and social characteristics of a setting will influence the way in which the setting is experienced” (Baum & Davis, 1976).

Interior design features

The third dimension of sources of environmental satisfaction is interior design features. Interior design features are defined by less permanent aspects of the hospital environment, which include furniture arrangements, color, and art (Dijkstra et al., 2006; Eisen, Ulrich, Shepley, Varni, & Sherman, 2008; Harris et al., 2002; Tsai et al., 2007). These are features that can be changed quickly in order to achieve improved outcomes without starting all over (Leather, Beale, & Santos, 2003). The goal of the interior design features is to provide a therapeutic environment by reducing stress, enhancing social support and interaction, as well as protecting privacy (McCormick & Shepley, 2003). Designers of healthcare environments must design with the patient as top priority and listen to the demands of the consumers of this environment. “Their selection must not only be function-driven but also help humanize the environment and meet the physical and emotional needs of the patients and care providers” (Ozcan, 2004).

Social features

The last dimension of sources of environmental satisfaction is a social feature, which consists of positive distractions. These are features that can be changed as well as used interchangeably and cater to individual patients’ needs. “Positive distractions refer to a small set of environmental features or conditions that have been found by research to effectively reduce stress” (Ulrich et al., 2004). These distractions may include windows, nature, daylighting,

music, artwork, television, or magazines (Arneill & Delvin, 2002; Delvin & Arneill, 2003; Schweitzer et al., 2004; Ulrich et al., 2004). Previous research on healthcare environments has suggested that patients are very satisfied with positive distractions such as artwork, reading material, and plants, all which result in increasing patient comfort and endorphin levels, and lowering heart rate and anxiety (Arneill & Delvin, 2002; Schweitzer et al., 2004). “Studies since then have documented the health benefits of “a good laugh,” as including greater optimism, socialization and cooperation among patients; decreased dependence on tranquilizers and pain-relieving medication; and less burnout among health professionals” (Schweitzer et al., 2004). Positive distractions also provide stimulation and stray patients away from boredom (Evans & McCoy, 1998; Ulrich, 1991). “Lack of stimulation leads to boredom or, if extreme, sensory deprivation. Insufficient stimulation may also deprive the human organism of practice in success” (Evans & McCoy, 1998). Therefore, positive distractions are an important aspect impacting patients in the healthcare environment and must be considered in the design process.

Evidence-based design

Another category of involving healthcare environments is evidence-based design. According to Hamilton (Hamilton & Watkins, 2009), “A healing environment is the result of design that has demonstrated measurable improvements in the physical and/or psychological states of patients and/or staff, physicians, and visitors.” In order for evidence-based design to be successful in healthcare environments, everyone (i.e. clients, designers, patients, etc.) must be involved, informed, and share the knowledge in order to make a good decision (Hamilton & Watkins, 2009). It seems necessary to move towards evidence-based design in healthcare environments

since medicine is also moving towards “evidence-based medicine” (Ulrich et al., 2004).

However, there are mixed feelings about this transition. Some suggest that we can now move to evidence-based design in healthcare environments, so that we can create hospitals that actually help patients recover, be safer, and help staff do jobs better, while others suggest that more information must be known to take this step (Ulrich et al., 2004).

Challenges facing healthcare facility research

Many challenges arise in conducting high-quality research on healthcare environments while two different fields, architecture and behavioral science, converge (Arneill & Delvin, 2002; Delvin & Arneill, 2003). “Apart from issues of lifestyle, aesthetics, or their specific relation to the reconstituted hospital and medical center, the field of health architecture had not fostered a tradition of research. These include the fact that architecture lacks a tradition of research, that medicine has overlooked the role of the physical environment in patient well-being, and that the research process in health care settings is exceedingly difficult” (Arneill & Delvin, 2002; Delvin & Arneill, 2003). Another problem that arises is the challenge of practitioners and consumers understanding or accessing research that appears in academic journals on this topic (Arneill & Delvin, 2002; Delvin & Arneill, 2003). Lastly, healthcare environments pose difficulties in conducting research in the health care setting. Delvin (Arneill & Delvin, 2002; Delvin & Arneill, 2003) quotes interior designer Jain Malkin commenting on the difficulty of doing good research because of the problems with experimental control and also stated, “For many design questions, there is no sound research yet available to inform the designer’s personal intuition, sensitivity, and experience.” “Opportunities exist to make meaningful contributions in this area

that will make significant impacts on the health outcomes of human beings” (Schweitzer et al., 2004). Continuing research on healthcare environments is essential and important to all human beings. One goal for future research is to share information known as well as the benefits of a therapeutic environment with consumers (McCormick & Shepley, 2003). It is also just as important to listen to demand, hear the consumers’ voices and apply design collaboration (McCormick & Shepley, 2003). Another concern for future research is the need for more sophisticated approaches to research in healthcare environments (Arneill & Delvin, 2002; Delvin & Arneill, 2003). “Future studies of patient-centered care will require more than just the application of quantitative ratings to observational data” (Arneill & Delvin, 2002; Delvin & Arneill, 2003). Lastly, something to consider is applying Dr. Ulrich’s Theory of Supportive Design to future plans of healthcare environments. Theory of Supportive Design proposes guidelines for creating a supportive environment by: fostering control (including privacy), promoting social support, and providing access to nature and other positive distractions (Ulrich, 2001).

Research in this field is increasing in importance and there is a need for continuing healthcare environmental design research. Although it is difficult to conduct research in healthcare environments, bridging the gaps between consumers and design research will be helpful (McCormick & Shepley, 2003). Also, information between these two groups has been incomplete and a slow process (McCormick & Shepley, 2003). There is a need for actual, real-life implications as well as to keep provoking further thinking and

research on characteristics of the healthcare environment that influences human health (Evans & McCoy, 1998; Ulrich, Simons, & Miles, 2003).

Objectives of this study

Given this emerging interest in influencing health through architecture, a natural question arises regarding the adoption of appropriate design practice in health clinics, such as a student health center. The objective of this study is to discover and enhance comprehension on the relationship between interior environments of healthcare facilities and the effect on patient behavior. I hypothesize that this study will result in finding simple elements that can be added to the interior environments of healthcare facilities to enhance patient satisfaction and well-being. The goal is for this study to provide more knowledge on designing health-conscious interiors for healthcare facilities, especially on college campuses.

CHAPTER II

METHODS

Background

Since this study involves patients' feelings and behaviors, observations and surveys are the research methods chosen to use. Research involving healthcare facilities is very difficult. There are many rules that must be followed such as, keeping the privacy of patients and avoiding the interference of medical care. Therefore, observations and surveys are methods that can be used to adhere to these rules. The following sections describe the research methods and processes in further depth.

Sample

The target population in this research is college students, as the research is conducted in Texas A&M University's Beutel Health Center. Beutel served as a representative of college healthcare facilities and a means for collecting data. In an ideal situation, everyone that utilized Beutel participated in this study by taking a survey assessing the waiting room environment. As the number of occupants in the waiting room may vary from day to day and hour to hour, the research was conducted Monday through Friday continuously during operating hours in order to acquire the largest sample size possible. This produced a considerable sample size in order to result in reliable conclusions.

Data collection procedures

The process of collecting data consisted of applying various methods together: observations, interviews, and surveys. This process of triangulation provided valid, reliable results while using techniques of both qualitative and correlation research methods.

Observations

In order to assess how occupants use the waiting room environment, observations were conducted in occupied and empty spaces. The observations were recorded by using the technique of behavioral sketch mapping (Ozcan, 2004). The sketch maps are floor plans of the observation space that are used to document patients' presence, movements, activities, and behaviors. First, observations were conducted in an empty waiting room to review the space and evaluate what activities may take place in this environment. Next, an occupied space was observed, taking note of the activities that take place and how the occupants behave or interact in this environment. After observing both, comparisons and relations were formed based on the data collected from the two observations. Important aspects to take note of include: time (i.e. morning, afternoon), day of the week (Monday versus Friday), size of the space, description of space, and activity taking place. These observations provided a reflection on how the space was performing and/or how it should be performing. This procedure offered many advantages such as presenting quantitative data, enabling unbiased views, and providing data without the involvement or inconvenience of users.

Interviews

It was important to discuss with Beutel staff their perspective on the interior environment of the waiting room. The staff's perception versus patients' perception may be very important. In order to determine these differences or similarities, interviews with various staff members of different organizational hierarchies and different areas of activity were useful. Questions asked during the interviews inquired about the staffs' views on the health center. The interviews imparted detailed exploration of issues, generated details and insight, as well as targeted specific knowledge.

Surveys

To determine the feelings and opinions of patients in this environment, surveys were distributed to waiting room occupants. Patients occupying the waiting area were given a survey along with other routine paperwork, in hopes that a numerous amount of surveys can be collected without interfering with anonymity.

The survey collected descriptive data as regards to patients' feelings, attitudes, experience, and perception on the interior environment. Demographic data was also collected to discover if there was a correlation between patients' feelings and their demographic background. This includes gender, ethnicity, college classification, and area of study within the university. The survey also provided validation for the observational data previously collected. Each question from the survey was analyzed separately as well as in relation to other questions to discover relationships between different variables. This allowed for the explanation of independent and

dependent variables that affect patients in this environment. The use of surveys enabled: generating of detailed quantitative data, obtaining broad based opinions, anonymity, and providing the opportunity to identify trends. The data was collected on paper forms and then tabulated into spreadsheets.

The format of the survey was a combination of yes/no, agree/disagree, like/dislike, and satisfied/dissatisfied type questions as well as a few open-ended questions. Using a mixture of these types of questions allowed for truthful answers and avoided leading participants in a certain direction.

Data analysis

The process of data analysis was accomplished by using two different methods: qualitative and correlation analysis.

Qualitative analysis

The process of data analysis is accomplished by using qualitative analysis. Qualitative analysis focuses on the holistic overview while studying a specific setting and interpreting the data. This was also a goal of this research project: to provide a holistic overview of the effect of healthcare interior environments on patients. Thus a qualitative analysis was appropriate.

This particular project involved the grounded theory, one approach to qualitative analysis.

Using the grounded theory suggests: letting the activities that take place in the health clinic

waiting room environment determine the data and offering insights in order to develop better understandings and meanings, which will lead to conclusions. One step in this process was sorting. Sorting required that the large amount of data collected to be coded and clustered into manageable groups according to certain themes or categories. This process included the reexamination of sorts multiple times in order to produce the most refined clusters. Also, some clusters may have had categories as well as sub-categories. For example, “Interior Features” may categorize one cluster with a subcategory of “Furniture Layout.” This process assisted in identifying patterns and relationships between different variables.

Generating and confirming meanings of data collected

Many tactics could have been used to begin to identify and analyze meanings of the data collected using qualitative analysis. These tactics included descriptive and analytical meanings. Descriptive meanings are found when using the previously discussed method, clustering, as patterns and themes are noted. Analytical meanings involved separating variables and being able to make comparisons and contrasts and record the relationships between the two.

In addition to identifying and analyzing the meanings, the next step was confirming the findings. It is important that the analyses are valid; therefore, confirming the findings was essential. Steps to confirming included reexamining the data and its quality throughout the research life, looking for pattern, and testing the results. Reexamining the data was done by the process of triangulation (using multiple methods and finding consistencies results in validity). Also, looking at patterns as well as looking for aspects that do not follow the reoccurring

patterns was very important in confirming meanings of the data collected.

Correlation analysis

Correlation analysis focused on the naturally occurring patterns and clarifying patterns of the relationship between two or more variables within the observation method. In this case, understanding the patterns of the relationship between the behavior and interaction of occupants in the waiting room environment is the focal point. Understanding the patterns and relationship between the two variables provided the meanings by simply measuring the variables and analyzing the relationship between the two.

Measurements can be done categorically, on an ordinal scale, or on an interval scale. This is the instant that surveys become important. A combination of measurements can be used depending on the variable that is in question. Demographic characteristics may be measured categorically while measuring occupants' behaviors is done on an interval scale.

Limitations

As expected, there are always limitations when conducting research, especially when involved with healthcare facilities and human subjects. Research methods were limited in this project because of issues with protecting the privacy of patients. However, generality, validity, and reliability was still achieved while respecting the privacy of the participants by taking advantage of other resources and methods that do not cross this barrier.

Generality

The results found using Texas A&M University's Beutel Health Center are assumed to be the same for any other college healthcare facility. The results from this project hope to conclude a reliable database for making improvements to college healthcare facilities around the world. It was valid to assume that the independent and dependent variables in the interior environment effecting patients found in this study, using the previously discussed methods, will be the same for another college healthcare center with a similar demographic profile. Therefore, results concluded here can be used at other college campuses with possible adjustments and with caution at other types of clinics.

Validity and reliability

It can be concluded that this research project will be valid by the process of triangulation. Using multiple methods together, either quantitative, qualitative, or both, will provide evidence that is reasonable and logical. Also, since multiple methods are used in collecting data, the result provided will be reliable. Development of well-documented surveys, analysis methods, and other protocols support the reliability of the results. Therefore, the results found in this project will be supported by evidence from various methods making them convincing results that are valid and reliable.

CHAPTER III

RESULTS

Observation results

Description of the environment

As discussed previously in Chapter I, sources of environmental satisfaction are aspects of the environment that affect patient behavior, attitude, and opinions. To recall, sources of environmental satisfaction include the ambient environment, architecture features, interior design features, and social features. The observation examined these aspects and found the following results.

Ambient environment

The waiting room area of Beutel is a relatively quiet space. Sounds that can be heard are those of nurses and staff talking to one another, nurses talking to patients, or nurses calling out patient names. With respect to lighting, sunlight shines in from the windows at the top of the high ceiling. Fluorescent lighting lines the ceilings above the hallways; however, there is no lighting directly above patient seating in the waiting area.

Architecture features

Converging hallways form the spatial layout of the waiting area making it rectangular in shape. The waiting area includes a nurse's station, seating for patients and a television. The windows in the waiting room are not accessible to see out by patients, as they are

located at the top of the high ceiling. The lighting in the waiting room is faint with few lights directly over the patient seating area.

Interior design features

The furniture arrangement in the waiting area includes individual chairs, a few years old, lined next to one another with a few inches separating each one. The chairs are arranged in a rectangular shape with all of the chairs facing each other, bringing the focus to the center. There is one small circular table in the center of the chairs that displays magazines and reading material. Other reading material can be found at the pamphlet rack along the wall. Nature paintings of mountains, streams, and trees as well as an abstract painting serve as the art pieces on the wall. The color of the room is mostly off-white along with some tan brick and off-white tile flooring.

Social features

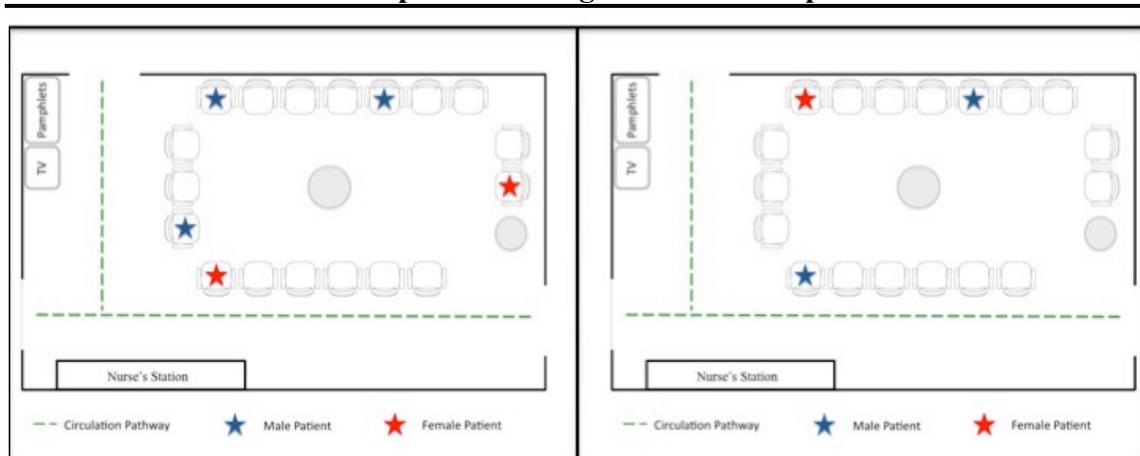
Magazines, pamphlets, flyers and a television serve as the positive distractions of the room.

Activity and behavior maps

During the observations, it was important to record presence, movements, activities, and behaviors of the occupants of the waiting room area. Recording this data allowed for behavioral cues to be recognized that otherwise would go unnoted, as there is more to behaviors than words can express.

First of all, behavioral sketch maps were used to illustrate and describe the presence and seating behaviors of patients. Figure 1 shows two examples of a sketch map of patient seating arrangements in the waiting room. Patients were consistent in sitting numerous seats away from other patients. Many chose to sit at least two seats away, while a larger amount of patients distance themselves even further by choosing to sit across the room.

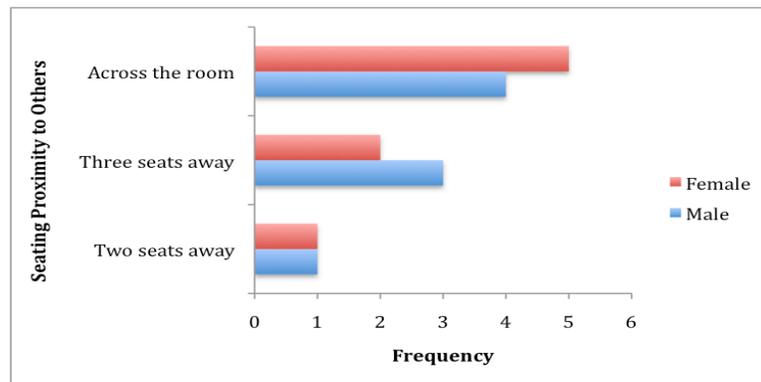
Figure 1
Examples of Seating Behavioral Maps



As illustrated in Figure 1 above, the variable of male and female does not seem to have an affect on where patients choose to sit. Equally, male and female patients distance themselves for the most part from other patients. Seating on the end of a row was

observed to be the first seat taken. From there, patients would choose a seat in a row unoccupied. In the occurrence of end seats taken on every row, patients would opt for a seat at least three chairs away from another patient.

Figure 2
Seating Proximity and Frequency



The graph in Figure 2 shows the seating proximity and the frequency in which it occurred during the observation period. It is apparent that sitting further away from other patients is the norm across both genders. The seating patterns observed such as this lead to the realization that patients seek some sort of privacy while occupying the waiting area. Patients attempt to gain privacy by using these spatial distances. In health care environments, it is important for patients to feel safe and comfortable. Privacy is one of the key aspects that allow patients to feel in control of their situation; since they

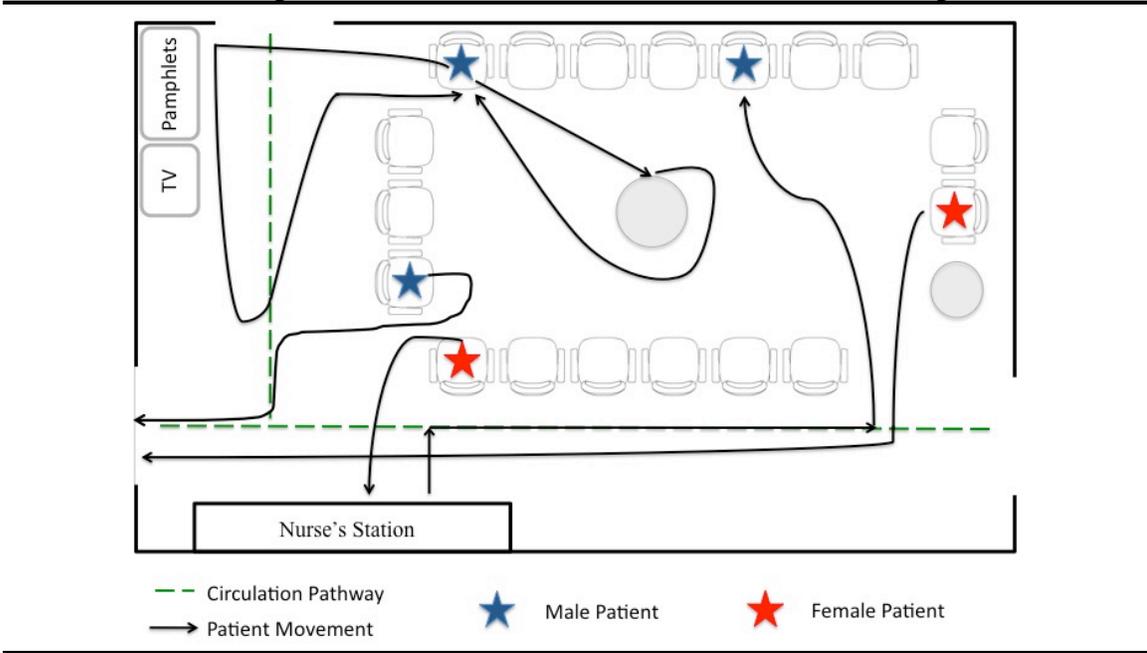
may not be in control of their medical condition, this is an important aspect in which the interior environment can provide to patients (Delvin & Arneill, 2003; Schweitzer et al., 2004). As shown in the behavioral sketch maps, patients arrange themselves in the waiting room in an effort to gain privacy and spatial proximity to others.

Next, the behavioral sketch maps were used to note movement and circulation patterns of the patients in the waiting area. Interestingly enough, the majority of patients made direct pathways to the main points of interest which include the nurse's station, the seating area, and the hallways leading to individual patient rooms. Once in the waiting area, patients had little interaction in the room, meaning that they stayed seated until called to report to individual rooms to see a doctor. On the contrary, one patient was observed wandering around the waiting room area. The patient aimlessly walked around the room making brief pauses at various features such as the rack of pamphlets along the wall. This demonstrated a behavior of a patient that may be restless, uncomfortable, or nervous. This behavior is illustrated in Figure 3.

Finally, patient activities were observed. There was a great range of activities that continuously took place in the waiting room, from patients sitting in their chair doing absolutely nothing to patients occupied with their cell phones. The most popular activity observed were patients using (not talking on) their cell phones. Patients watching others and looking around the room without purpose followed as the second most frequent

activity. The chart in Figure 4 presents all of the activities observed and the frequency of occurrence.

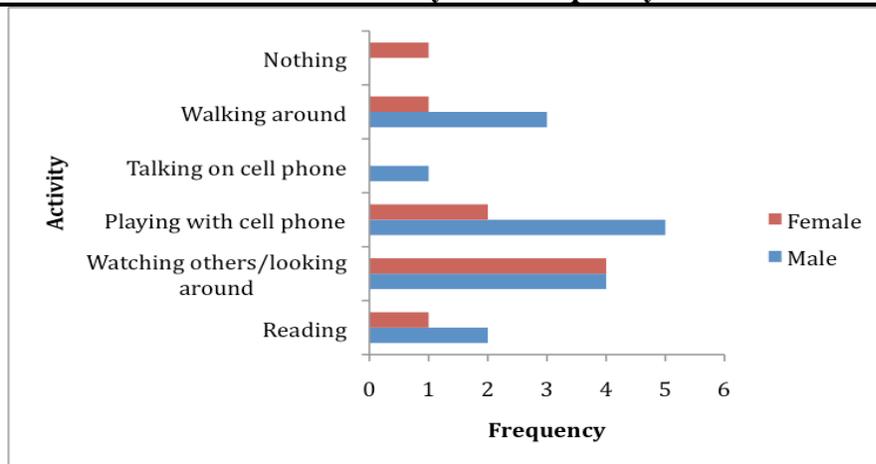
Figure 3
Example of Circulation and Movement Behavioral Map



The activities observed lack social interaction, although the spatial layout of the room encourages and promotes social interaction. However, in health care environments, it is typical for patients to keep to themselves and avoid social interaction (Ulrich et al., 2004), as it has been demonstrated in this case. The activities that patients engage in while in the waiting room justify that patients prefer not make eye contact with others

and in a sense withdraw themselves from any type of social interaction while in the waiting area.

Figure 4
Patient Activity and Frequency



All of the aspects noted in the observation are important and valuable results that will later be compared to the results from patient surveys. The actions and behaviors of patients seen in the observations may speak volumes above those found in the surveys; thus, observation results are a viable alternative for getting many questions answered.

Survey results

Out of the 95 patients that completed the survey, 53% were males with the majority of patients (58%) having visited Beutel numerous times. After analyzing the surveys taken by patients, the results can be characterized as follows.

Ambient environment

Overall, patients were content with the ambient environment of the waiting room area. 25% of patients “Somewhat Like” the sound/noise in the room while the majority, 38% remained “Neutral.” When asked, “Would you prefer noise in the waiting room?” patients responded strongly with 61% saying “No.” “Among the dimension of temperature of the room, 50% of patients “Somewhat Like” the temperature and only 4% disliked it completely. The aspect of the ambient environment with the most contemplation from patients was lighting. Many patients left comments concerning lighting such as, “more lighting is needed for patients that want to read.” While 32% of patients remained “Neutral,” 32% of patients also chose to “Somewhat Like” the lighting in the waiting room. When asked, “Would you prefer more natural lighting in the waiting room?” patients responded with 54% “Yes” and 39% having “No Opinion.”

Architecture features

The main architecture feature examined in the survey was windows. 46% of patients remained “Neutral” while 29% took the stance of “Somewhat Like.” Only 7% of patients were completely satisfied with the windows in the waiting room. However, the

majority of patients responded strongly to preferring windows with views of nature. On the topic of spatial layout of the waiting area, patients were not too concerned with the space when related to crowding. 36% “Somewhat Disagree” that the space was crowded while only 4% agreed.

Interior design features

The majority of patients remained “Neutral” when asked about aspects such as furniture, decorations, color. On the other hand, when asked about artwork in the waiting room, 61% of patients preferred having artwork as opposed to having none. A series of questions were asked in the survey concerning how patients feel about the seating in the waiting room. The majority agreed that the seating was comfortable and accommodating without being crowded. Patients remained neutral when asked if they preferred movable seating, a different type of seating, or a different type of seating arrangement.

Social features

When patients were asked about liking or disliking an aspect such as television, magazines, and privacy they took a neutral stance. However, when patients were asked if they preferred these features, a stronger stance was taken. 71% of patients preferred having a television in the waiting room. Although, many patients commented that the television was never on, something that they suggested to make the environment more enjoyable. Reading material such as magazines were highly valued with 85% of patients

preferring to have this aspect present in the waiting room. The patients liked this aspect but suggested that a wider variety of reading material be available in the waiting room. The social aspect patients were unsure about was the aspect of privacy. 43% felt like they had enough privacy. When asked if more privacy was preferred, 50% chose “No Opinion” while the other half divided to chose either “Yes” or “No.” However, one patient highly suggested improvements to privacy as they commented, “I have actually overheard doctor and patient conversations.” This patient comment demonstrated the need for more privacy.

Patient activities

The survey also asked patients about the activities they participate in while waiting. The top two activities were using/playing with a cell phone (65%) and reading (59%). 37% of patients prefer to watch television or listen to music while waiting. The activity that was least preferred was talking to other patients in the waiting room. One patient suggested having a computer available for patients to use while waiting as an activity they would enjoy.

Patient feelings

Patients were asked numerous questions about their feelings and how they feel in the waiting room environment. Overall, the environment did not effect patients’ feelings negatively. 46% of patients were satisfied with the environment overall. 43% “Somewhat Agree” that the waiting room was relaxing as well as calm. 36% of patients

“Somewhat Agree” to feeling content in the waiting room. Among the negative feelings, feeling tense and stressed were not concerns of the patients as the majority chose to “Somewhat Disagree” about the environment possessing these qualities. Patients were also fairly pleased with the “friendly,” “healthy,” and “professional” aspects of the environment as the majority chose to “Somewhat Agree.” The only aspects patients felt negatively about were the feelings of “institutional” and “home-like.” Patients tended to agree with the fact that the environment felt “institutional” instead of “home-like.”

Patients were given a chance to express what they would change about the environment and the following results were found: 50% would change the lighting, 46% would change the decorations, 38% would change the seating arrangement as well as the color of the waiting room. These were the top aspects that patients would change. This was followed by sound and privacy.

CHAPTER IV

DISCUSSION AND CONCLUSION

Discussion

The goal of this study was to answer the following objectives:

- I. How do patients feel about the interior environments of Beutel Health Center and what aspects influence this feeling?
- II. What are the independent and dependent variables present in the interior environment that effect patient well-being?

First of all, how do the patients feel about the interior environment? Overall, the results prove that patients are quite satisfied and fairly content with the waiting area of Beutel Health Center. Patients felt relaxed, calm, and content and for the most part were neither tense nor stressed. The next question is: what aspects influenced these feelings?

Patients felt that the environment was healthy, friendly, and had ample room for personal space; therefore, these aspects left the patients feeling positively about the waiting room environment.

Finally, what are the independent and dependent variables that affect patients the most?

The pattern of responses suggest that that following are the biggest issues in the interior environment:

Windows/lighting

As patients remained neutral on aspect of lighting and windows, one can assume that this is an area that can use improvement. Likewise, patients had strong opinions when more windows with views of nature were in question. Adding windows, especially with views of nature, may enhance contentment and well-being in patients. Windows provide natural lighting, therefore allowing for less harsh overhead lighting in the waiting room.

Positive distractions

Patients were adamant about having positive distractions present in the waiting room. This includes a television and a plentiful amount of magazines. These aspects help draw patients' attention away from their medical condition or environment and provide a way for patients to occupy time while waiting. Also, artwork was an aspect preferred by patients, another aspect that provides a positive distraction. Artwork and decorations that are of nature content enhance patient well-being.

“Neutral” and “Somewhat” responses

A majority of patients responded with “Neutral” or “Somewhat Agree/Disagree” or “Somewhat Like/Dislike.” These responses may suggest two things: Either these aspects are not important to patients or these aspects need improvement. When patients chose to be “Neutral” on a subject, they decided not to take a stance. This aspect was either not important to them, they had no opinion, or maybe they weren't sure what it meant. When patients chose to answer under the “Somewhat” category, they did not feel

strongly about a certain aspect. This pattern of responses indicates that there are many aspects which patients are neither extremely satisfied nor extremely dissatisfied. This suggests that there must be room for improvement. The goal is for an environment to completely satisfy a patient and enhance their well-being.

Comparison of observation results & survey results

When the results from the observation were compared to the survey results, consistencies were found. Patients' behaviors, movements, and activities observed correlated with the answers patients provided on the survey. This validated the reliability of the results found in this study.

Design suggestions and considerations

- Design for moveable chairs, allowing for patient control of privacy and spatial proximity.
- Design seating arrangements that improve patients' feelings of privacy and comfort.
- Provide a television, a computer, magazines/books, or music for patients to use while in the waiting room to occupy time.
- Design environments that provide windows with interesting views such as nature, a sculpture, or a water feature.
- If windows with nature views are not an option, bring natural elements into the room with flowers or potted plants.

Implications for future research

For research on this topic in the future, it would be valuable to possibly interview patients in person to get a greater, more precise response on patient feelings. Also, future research may look closely at the aspects in which patients showed a strong response (aspects that patients found particularly important). Another suggestion would be to distribute surveys year around to find patients' feelings, behaviors, and opinions throughout the year. This would investigate if patients feel differently about the environment during different times of the year.

Conclusion

So what exactly does this all of this data mean? This study was consistent with the previous literature on healthcare environments. Providing natural lighting, positive distractions, and seating arrangements that enhance feelings of privacy, security, and comfort are key aspects that architects and interior designers must be aware of when designing healthcare facilities. The interior environments of healthcare facilities must provide aspects that allow for patient control in order to enhance patients' well-being and satisfaction. Positive distractions are simple elements that can be added to the interior environment that will reduce patient stress and increase patient contentment while in the waiting room. Providing a television, a variety of reading material, and an available computer for patients to use are all positive distractions, which patients respond positively. Bringing nature into the environment with flowers, potted plants, or nature artwork also provides positive reactions from patients. It is important to realize

that by these adding simple elements to the interior environment of healthcare facilities, patient welfare is enhanced along with positive attitudes, opinions, and behaviors.

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APPENDIX A

RESEARCH SURVEY

Assessing College Campus' Health Clinic Waiting Room Environments

Please answer the following questionnaire to assist research being conducted on waiting room interior environments of college health clinics. Participating in this research results in assisting designers in creating environments that produce positive human well-being as well as providing a reliable database for making improvements to the interior environments of healthcare facilities. Thank you for your time and cooperation.

Date: _____ **Time:** _____ **Age:** _____

Gender:

- Male
- Female

Ethnicity:

- Caucasian
- African-American
- Hispanic
- Asian
- Other:

Classification:

- Freshman
- Sophomore
- Junior
- Senior
- Graduate
- Other:

College:

- Architecture
- Agriculture
- Bush School
- Business
- Education
- Engineering
- General Studies
- Geoscience
- Liberal Arts

- Science
- Veterinary Medicine
- Other:

How many times have you visited Beutel Health Center?

- First time
- Once
- Twice
- Numerous times

Overall, how do you feel about the waiting room environment?

| | | | | | | |
|--------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------|
| | 1 | 2 | 3 | 4 | 5 | |
| Dissatisfied | <input type="radio"/> | Satisfied |

How much do you agree or disagree with the following statements?

| | Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Agree |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I feel relaxed in the waiting room. | <input type="radio"/> |
| I feel calm in the waiting room. | <input type="radio"/> |
| I feel tense in the waiting room. | <input type="radio"/> |
| I feel content in the waiting room. | <input type="radio"/> |
| I feel stressed in the waiting room. | <input type="radio"/> |
| The waiting room feels institutional. | <input type="radio"/> |
| The waiting room feels home-like. | <input type="radio"/> |
| The waiting room feels professional. | <input type="radio"/> |
| The waiting room feels crowded. | <input type="radio"/> |
| The waiting room feels like a friendly environment. | <input type="radio"/> |
| The waiting room feels like a healthy environment. | <input type="radio"/> |

How do you feel about the following aspects of the waiting room?

| | Dislike | Somewhat dislike | Neutral | Somewhat like | Like |
|--------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Lighting | <input type="radio"/> |
| Furniture | <input type="radio"/> |
| Decorations | <input type="radio"/> |
| Sound/Noise | <input type="radio"/> |
| Temperature | <input type="radio"/> |
| Personal space/proximity | <input type="radio"/> |
| Color | <input type="radio"/> |
| Windows | <input type="radio"/> |
| Artwork | <input type="radio"/> |
| Television | <input type="radio"/> |
| Magazines | <input type="radio"/> |

How much do you agree or disagree with the following statements?

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The seating in the waiting room is comfortable. | <input type="radio"/> |
| The seating in the waiting room is accommodating. | <input type="radio"/> |
| The seating in the waiting room is crowded. | <input type="radio"/> |
| I would prefer seating that is movable. | <input type="radio"/> |
| I would prefer a different type of seating. | <input type="radio"/> |
| I would prefer a different type of seating arrangement. | <input type="radio"/> |

Which of the following activities do you do to occupy time while in the waiting room?

Check all that apply.

- Watch TV
- Listen to music
- Read book or magazine
- Talk or text on the phone
- Use a computer
- Talk to others waiting
- Nothing
- Other:

Please answer the following questions.

| | No | No Opinion | Yes |
|--|-----------------------|-----------------------|-----------------------|
| Do you prefer more privacy in the waiting room? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Do you prefer more natural lighting in the waiting room? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Do you prefer windows with a view of nature in the waiting room? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Do you prefer a television in the waiting room? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Do you prefer reading material in the waiting room? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Do you prefer artwork in the waiting room? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Do you prefer noise in the waiting room? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Would you want to change any of the following aspects of the waiting room?

Check all that apply.

- Lighting
- Seating Arrangement
- Privacy
- Sound
- Temperature
- Decorations
- Color
- Other:

What, if anything, would you like to see in the waiting room to make it more enjoyable?

Please give any comments or suggestions concerning the waiting room environment.

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