Mental and Behavioral Health Environments: Measurement of Building Performance

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EXECUTIVE SUMMARY

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There has been an increase in the number of mental and behavioral health (MBH) facilities built in the United States in the last few years; however, research has not kept pace to inform the design process. Currently, little is known about facility design in MBH settings, and standards of best practice have yet to be established. The emergent use of evidence-based design strategies in healthcare settings has opened the door for dialogue and research.

This white paper describes an empirical study of MBH facilities. The purpose of the study is fourfold: 1) to develop a tool to evaluate mental and behavioral health facilities 2) to identify design features believed to positively impact staff, patients, and families in psychiatric environments 3) to evaluate the quality and presence of these features in existing facilities and 4) to make recommendations for future research.

LITERATURE REVIEW

The literature review addresses design features believed to confer positive changes in individuals in an MBH environment. We identify and explore the aspects of design that have been subject to debate in the literature and in the industry. Lastly, we elucidate the areas of design in MBH facilities that would benefit from further research. Interviews, focus groups, and surveys were used to explore these issues and are described in detail.

The review incorporates and expands upon an in-depth review conducted by Shepley and Pasha (2013). Rather than address the entire body of published documentation on MBH environments, this research project focuses on issues that have received at least a minor level of substantiation. The following topics were identified by Shepley and Pasha as the ones with the most (although limited) support in the research literature.

1. Deinstitutionalized and Homelike Environment
2. Orderly and Organized Environment
3. Well-Maintained Environment
4. Visual or Physical Access to Nature
5. Damage-Resistant Furnishings
6. Maximum Daylight
7. Staff Safety/Security
8. Private/Low Density Rooms
9. Patient-Staff Interaction/Observation
10. Social Interaction/Community
11. Autonomy and Spontaneity
12. Suicide-Resistant Furniture Fixtures and Equipment (FFE)
13. Mix of Seating
14. Smoking Room
15. Nurse Station Observation
16. Indoor/Outdoor Therapy
17. Staff-Patient Interaction

METHODS AND RESEARCH TOPICS

This research project consisted of seven phases, including the pilot studies as summarized in the following figure. In summary, a draft version of the survey tool, entitled the Psychiatric Staff Environmental Design (PSED), was developed. It was based on the previous literature and used as the topic of discussion for the interviewees who were identified by a snowball search process. The interviews were followed by a focus group whose members also served as subjects for the pilot study. Based on these conversations, the survey was revised and then distributed to psychiatric nursing organizations and a treatment facility. Overall, there were four primary methods of research: snowball search, interviews, focus group, and surveys.

1) Conduct **snowball search** to identify designers, clinicians and academics specializing in mental and behavioral health who will serve as interviewees

2) Create the **subject topics for the interviews** based on literature review.

3) Conduct **interviews** with designers, clinicians and academics to challenge of validate survey topics and generate the pilot **PSED survey.**

4) Distribute **pilot PSED survey** and make modifications based on results.

5) Conduct **focus group** and make modifications based on results.

6) Revise **PSED survey** and distribute to psychiatric staff.

7) Analyze data, generate guidelines, modify PSED and disseminate results.

SNOWBALL SEARCH

The researchers started with a known group of experts and contacted these individuals to ask whom they consider to be experts; the additional experts in turn provided still more names. The 17 final interviewees were from a range of professions within the field of MBH care and design. Represented professions include psychiatric nursing, academia, architecture, and administration of hospitals and facilities.

INTERVIEWS

Each interview was allotted a maximum of 35 minutes from start to finish and was conducted by the principal investigator (PI). With the exception of two of the interviews, a research assistant also participated. Once the interview transcripts were generated, data was collected and analyzed using the qualitative analysis method described by Lincoln and Guba (1985) in Naturalistic Inquiry.

FOCUS GROUP

The focus group critique took place in an architectural office in Boston, MA. Participants included the principals/architects in two design firms, a senior staff architect, and a senior staff interior designer. Also present were the PI and a student research assistant. Four participants met in person and two were connected to the meeting via WebEx. Comments were reviewed immediately after the focus group and modifications were made regarding the content of the survey.

PSED SURVEY

Subjects for the PSED survey were recruited from five psychiatric nursing organizations and a large behavioral health facility in New York City. The organizations were the International Society of Psychiatric-Mental Health Nurses, Horatio (Europe), American Psychiatric Nurses Association, Canadian Federation of Mental Health Nurses, and Australian College of Mental Health Nurses. The analysis of interview note cards informed modifications to the Psychiatric Staff Physical Environment (PSED) survey. In addition, respondent demographic questions were added to the survey to assess job title, experience, location, and other variables.

The core questions in the 50-question survey followed a pattern. For each design topic, three questions were asked. The first question asked respondents to rank the importance of design qualities that pertain to a specific design topic, such as landscaping. The second question asked respondents to rank the importance of the topic. The third question asked respondents to assess their current facility's ability to address the topic. Once all of the topics raised during interviews had been addressed on the survey, the survey questions were given to the focus group for a follow-up critique.

RESEARCH TOPICS

Multiple relationships were investigated in this study, examples of which follow:

- Relationship between demographics and perception of importance or effectiveness (Typical hypotheses: Nurses perceive the environment to be less effective and more important than doctors do; more experienced nurses perceive the environment to be less effective and more important.)
- Relationship between importance and effectiveness (Hypothesis: The greater the importance, the lower the effectiveness.)
- Relationship between type of facility, effectiveness, and importance (Hypothesis: Different types of facilities will have different effectiveness and importance.)
- Relationship between importance of different environmental characteristics within categories and overall (Hypothesis: Some characteristics will be found to be more important than others.)
- Relationship between effectiveness of different environmental characteristics within categories and overall (Hypothesis: Some characteristics will be found to be more effective than others, e.g. safety rather than nature.)

RESULTS

INTERVIEWS

Overall, the majority of the topics derived from the literature review were deemed appropriate for the survey by interviewees. Some topics were challenged (e.g., order/organization and autonomy/spontaneity) because the definitions of terms were unclear. The topic of suicide was generally thought to have been previously addressed, but due to the critical need to protect life, it was retained. The topic of smoking was neither objected to nor supported, as most interviewees perceived smoking to be a non-issue due to the advent of restrictions in many buildings and the availability of nicotine patches.

There was an unexpectedly strong response to two of the topics: the importance of access to nature and the importance of an aesthetic environment. These environmental interventions are often seen as amenities, or extras, rather than core components. However, all of the interviewees indicated that these were important considerations, so they were added to the survey.

Two topics generated intense discussion during the interviews: private versus shared bedrooms and open versus closed nurse stations. The majority of interviewees felt that private rooms were highly desirable as they reflect a less institutional environment, but two were adamantly opposed, stating that the increased supervision by other patients in a shared bedroom could be a deterrent to self-harm. The point was also made that private rooms increased construction costs and (potentially) staffing costs due to the greater difficulty supervising larger areas. The point was also made that patients have vastly different diagnoses and therefore different needs in terms of private versus shared rooms.

Regarding open versus closed nurse stations, the debate centered on the protection and safety of staff, as well as the protection, safety, and normalization of patients. Interviewees commented that staffers need to provide the most supervision possible and to interact with patients directly. On the other hand, staff members in units with potentially violent patients consider the nurse's station as a place of retreat in an emergency. Two interviewees mentioned a hybrid station. Another possibility is a closed nurse station that can be transformed easily into a less formidable barrier between staff members and patients.

FOCUS GROUP

Eight additional topics were generated via the interviews and focus group. These topics were added to the survey and were the following:

- Attractive/Aesthetic Space
- Attractive/Comfortable Furniture
- Good Electric Lighting
- Noise Control
- Impact of Experience
- Positive Distraction
- Impact of Length of Stay
- Impact of Unit Size

SURVEYS

Subject characteristics

Approximately 70% of subjects had more than 15 years of work experience in psychiatric facilities. Sixty percent were psychiatric nurses. Their occupations included: registered nurses (RN), psychiatric licensed practical nurses (LPN), clinical psychologists, mental health counselors, occupational therapists and social workers, treatment managers and educators, and non-licensed personnel such as mental health technicians and patient safety attendants. Half of the respondents were affiliated with residential facilities. The highest response rates came from the United States and Australia. Subjects worked in facilities that specialize in patients with a broad range of diagnoses.

Facility and patient population characteristics

Fifty-three percent of respondents worked in facilities that were adjacent to or part of a general hospital. Forty-three percent of these hospitals' emergency rooms had 10 holding areas or fewer, while 14% were larger than 20 bed units. In surveyed outpatient facilities, 26% had more than 20 counseling rooms and only 5% had five rooms or fewer.

The average residential facility had a total of 10 to 50 beds. Within these facilities, 70% had units ranging from 15 to 25 beds. The recommended size of a unit,

according to 75% of respondents, was 11 to 20 beds. In the majority of units, fewer than 50% of patient rooms and fewer than 50% of bathrooms were private.

We sought to compare length of stay in our population with national demographics. Almost 50% of respondents in this study reported that the average length of stay of a patient was slightly less than seven days. This is similar to the average length of stay (7.2 days) for hospital inpatient care for all diagnosed mental disorders in the US, as reported by the Centers for Disease Control and Prevention (2015). In Australia, according to that country's Institute of Health and Welfare (2015), the average length-of-stay in public acute care hospitals was 16 days in 2013-2014, or more than twice as long.

Importance versus Effectiveness and Environmental variables

One of the important conclusions of this study is that there is a statistically significant difference between the perceived importance of desirable features and the perceived effectiveness of them. In other words, there is a gap between what psychiatric nursing staffers feel is important in the facilities where they work and the presence or quality of those traits in their facilities.

The data was separated into general categories (i.e., deinstitutionalized/ homelike environments, orderly and organized environments, well-maintained environments, access to nature, and attractive and aesthetically pleasing features) and more specific environmental features (security, noise, day lighting, furniture, lighting, staff respite, etc.). A summary follows of some of the conclusions under these two headings.

General categories

Overall, the observation that an environment was well maintained was perceived as the single most important quality in an MBH setting. This was followed by other qualities: access to nature, attractiveness and aesthetics, deinstitutionalized environment, and orderly and organized environment. All of these qualities were perceived as relatively important; only the difference between the first one (maintenance) and the last one (orderliness) was statistically significant. And while all of these factors were considered to be important, none of them was perceived to be effective in the facilities where people were reporting from.

The primary findings (both statistically significant results and substantive trends) for the general categories were:

- A sense of respect for patients, choice and control, and a welcoming entry area were the most highly ranked contributors to a deinstitutionalized and homelike environment.
- Absence of clutter and a navigable and readable environment were the most highly ranked contributors to achieving an organized and orderly environment.
- Clean floors, walls, and furniture, and well-operating mechanical systems were

the most highly ranked contributors to a well-maintained environment.

- Views of gardens and views of natural landscapes were the most highly ranked contributors to achieving visual access to nature.
- Outdoor safety and private conversation spaces were the most highly ranked contributors to creating an accessible outdoor environment.

Specific environmental features

The primary findings (both statistically significant results and substantive trends) for specific environmental features were these:

- Adequate staff safety and security was the highest priority of environmental features among respondents to this questionnaire.
- Good noise control was the second most important environmental category.
- Day lighting, comfortable furniture, appropriate electrical light, damage-resistant furniture, and staff respite spaces were not as strongly supported as staff safety and noise control, but they were still deemed to be important.
- Staffers in facilities that have private patient rooms feel that this privacy is important. (The mean importance score of private patient bedrooms on a 7-point Likert scale was 5.84 and the mean importance score of private bathrooms was 5.82.) This topic was the most contentious of those addressed in both the interviews and the survey.
- One-on-one consulting rooms were considered to be the most important and effective means of enhancing staff-patient interaction, followed by monitoring via a window and open nurse stations. Camera and audio monitoring and closed nurse stations and auditory monitoring were considered to be ineffective.
- Positive distraction was found to be almost as important as suicide resistance. Contributors to positive distraction, in order of importance, were music, board games, and video games.
- Group activities, shared eating, and group therapy were thought to be the primary contributors to social interaction and a sense of community.
- Primary contributors to staff respite were outdoor spaces for staff and a private staff entrance. A staff nap room was not considered particularly important.
- Security was the primary contributor to patient autonomy and spontaneity. Other features, slightly less strongly supported, were: technology, access to the outdoors, access to exercise, and access to snacks.
- Regarding contributors to suicide-resistance, basic anti-ligature devices are the most important. Shared bedrooms and shared bathrooms were not thought to contribute to suicide resistance, which runs contrary to the opinion of some interviewees.

Staff characteristics and outcomes

- Data suggest that job title was not related to an individual's sense of the importance of predicted environmental variables, although that title was related to perceived effectiveness.

- Current setting (rural, suburban, or urban) was not related to the importance or effectiveness of quality landscaping.
- Staff from urban facilities viewed quality landscaping similarly to staff from facilities in rural environments, in terms of its importance and effectiveness.
- Time in the field was related to the perceived importance of attractive and well-maintained environments.

CONCLUSION

DESIGN GUIDELINES

In spite of the lack of pre-existing evidence-based recommendations, the preliminary data from this study suggest several design objectives for MBH environments (in order of reported importance):

- features that ensure patient safety
- features that ensure staff safety
- presence of positive distractions
- high levels of maintenance
- spaces dedicated to staff respite
- visual and physical access to the outdoors
- attractive and aesthetically pleasing decor
- deinstitutionalized appearance
- orderly and organized furniture, storage, and configuration

Private rooms and open nurse stations received a great deal of support in the interviews and surveys, but no recommendation is provided at this juncture for these design options. These components have dramatically significant impacts on staff and patient safety and must be researched more diligently. A conservative approach in both cases would be to provide hybrid features, which address the diverse needs of patients. In the case of private rooms, it is recommended to provide private and semi-private rooms or large private rooms that could be converted to shared rooms if needed.

In the case of nurse stations, a semi-open station with the flexibility to be fully open after minor remodeling is a thoughtful approach. This supports the notion that patients are not all identical in their needs and that a mix of diagnoses will vary over time. In conclusion, our research team strongly suggests that future research in behavioral health facilities focus on the impact of private patient rooms on suicide attempts and other outcomes, as well as outcomes associated with open and closed nurse stations.

THE PSYCHIATRIC STAFF ENVIRONMENTAL DESIGN **(PSED)** RESEARCH TOOL

The usefulness of the PSED tool was corroborated by the high level of importance associated with each of the research questions. The only question that received a low importance rating was about smoking. This issue is being addressed by other

means, such as nicotine patches. Other minor modifications to the instrument include requesting more specific information on the number of rooms, etc., and the re-clustering of specific topic areas.

QUALITY OF EXISTING FACILITIES

One of the clearest findings in this study is that there is a significant disparity between the environments that MBH staffers believe are important for the health of patients, families, and staff and the frequency of these features in their facilities. The impediments to achieving these design goals include fiscal limitations, stigmatization of mental health patients, and lack of research to support design objectives.

FUTURE RESEARCH

The research project's literature, interviews, focus group, and survey helped to identify prime areas for future research on MBH facilities. Our recommendation, in order of priority, would be studies on:

1. private versus shared bedrooms
2. open versus closed nurse stations
3. acoustics
4. access to nature
5. positive distraction
6. lighting
7. staff respite areas

The impact of private versus shared bedrooms and the design of nurse stations are most urgent topics due to their impact on safety. Shared bedrooms might cut down on the frequency of aggressive acts and suicide attempts; we need to find this out. And we need to know if the degree of openness of a nurse station might have a desirable effect on patient behavior and sense of security and on staff sense of security.

The objectives of this research project, which were to create a tool for evaluating MBH facilities, to identify design goals, to evaluate the quality of existing features, and to make recommendations for future research, were met. The findings are an initial step toward focusing attention on MBH settings. We hope that the content will inspire and inform future designers and researchers.
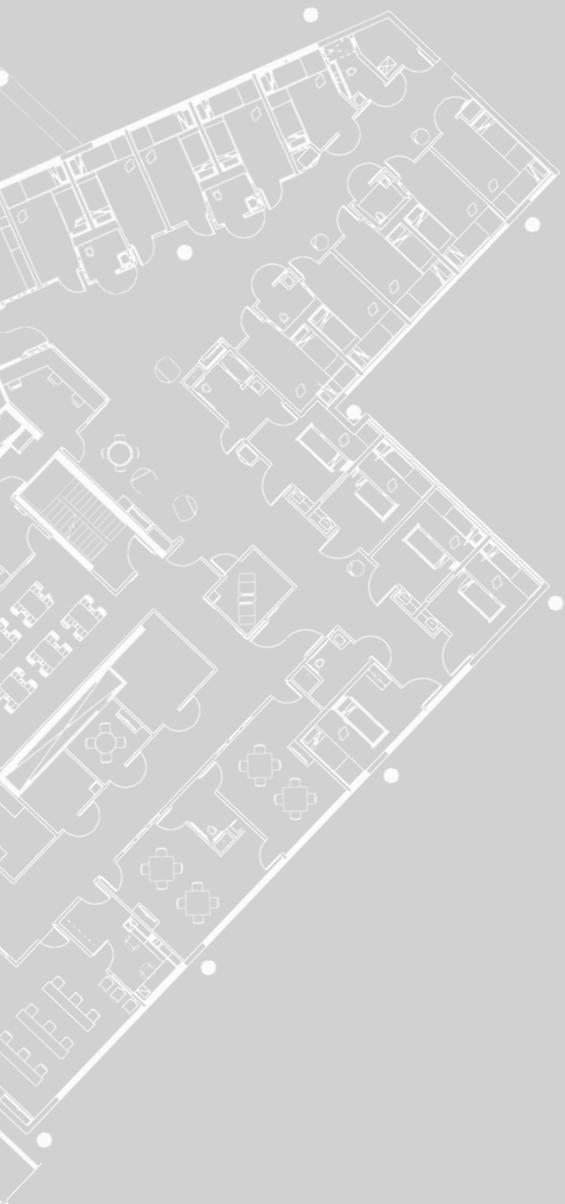
ABSTRACT

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OBJECTIVES

This research describes an empirical study on behavioral and mental health facilities. The purpose of the study was fourfold: to develop a tool for the evaluation of mental and behavioral health facilities; to identify design features that are believed to positively impact staff, patients, and families in psychiatric environments; to evaluate the quality and presence of these features in existing facilities; and to make recommendations for future research.

METHODS

The project consisted of four primary methods: snowball search, interviews, focus group, and surveys. These were implemented in seven phases. A draft version of the Psychiatric Staff Environmental Design (PSED) tool was developed based on the previous literature and used as the topic of discussion for the interviewees (N=19) who were identified via a snowball search process. The interviews were transcribed and analyzed using Naturalistic Inquiry methodology. The interviews were followed by a focus group. Based on those conversations, the survey was revised and distributed to psychiatric nursing organization members (N=134) to evaluate its appropriateness and the quality of the facilities in which the nurses currently treat patients. Patient care staff from four psychiatric nursing organizations participated, representing Europe and the UK, the United States, and Australia, in addition to staff from a large MBH organization in New York City.

FINDINGS

Interviews and focus group. Interview and focus group participants reviewed the proposed survey in detail and requested that we expand the survey to include outpatient facilities, add eight new questions (e.g., preference for free-standing versus hospital-based facilities) and clarify the demographic background of our survey subjects and the type of patients they serve (e.g., drug rehabilitation). The proposed survey tool was modified as a result of the interviews and focus groups.

Survey. Subjects evaluated the effectiveness and importance of features such as:
• Deinstitutionalized and Homelike Environment
• Orderly and Organized Environment
• Well-Maintained Environment
• Visual or Physical Access to Nature
• Damage-Resistant Furnishings
• Maximum Daylight
• Staff Safety/Security
• Private/Low Density Bedrooms
• Patient-Staff Interaction/Observation
• Social Interaction /Community

The results of the revised survey regarding the above topics were extensive, but

among the most interesting findings were these: support for private patient bedrooms, the critical role of positive distraction, and differing definitions of homelike/deinstitutionalized environments. Another significant result was the extreme disparity between the perceived importance of specific environmental qualities (e.g. access to nature), and the presence/quality of these attributes in existing facilities.

PRACTICAL IMPLICATIONS

The PSED tool, in its new and modified state, is suitable for use in evaluating facilities in the future. Guidelines for mental and behavioral health facilities were identified using the categories summarized above. These recommendations are prioritized relative to the level of need expressed by the subjects.
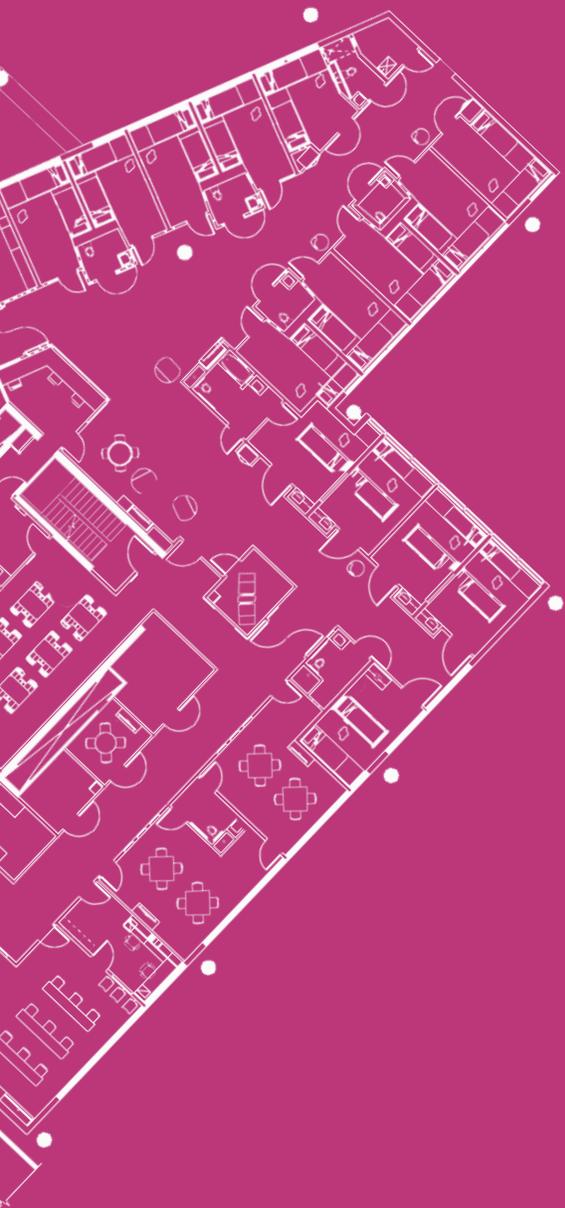
1. INTRODUCTION

1.   INTRODUCTION

The vast majority of our mental institutions are castle keeps that imprison the soul rather than homes where a badly torn mind can be so tenderly cared for that it learns to live comfortably with its body, and within itself (Bettelheim, 1974, p.91).

Lack of access to mental health services is an international issue. Approximately 55% of people with mental health disorders and 88% of those with addiction disorders are not receiving adequate care in the United States (SAMHSA, 2015). According to the 2007 National Survey of Mental Health and Wellbeing in Australia, the collected data on access to mental health services estimated that only 35% of people with a 12-month mental disorder used mental health services (ABS, 2008). Similarly, a data analysis on the 2002 Canadian Community Health Survey revealed that 39% of Canadians with a mental health disorder or substance dependence received services (Urbanoski, Rush, Wild, Bassani & Castel, 2007) and only about a quarter of people in Britain with a mental health disorder receive ongoing treatment (Halliwell, Main & Richardson, 2007).

In the United States, new inpatient facilities are being designed in response to the 2010 Patient Protection and Affordable Care Act, which mandates mental health coverage for insurance plans; however, research on behavioral health (BH) environments is inadequate to support the design process. The emergent use of evidence-based design strategies in healthcare settings has opened the door for dialogue and research in the design of MBH facilities. Currently, little is known about facility design in MBH settings, and standards of best practice have yet to be established.

This research describes an empirical study of MBH facilities. The purpose of the study was fourfold: to develop a tool for the evaluation of mental and behavioral health facilities; to identify design features that are believed to positively impact staff, patients, and families in psychiatric environments; to evaluate the quality and presence of these features in existing facilities; and to make recommendations for further research.
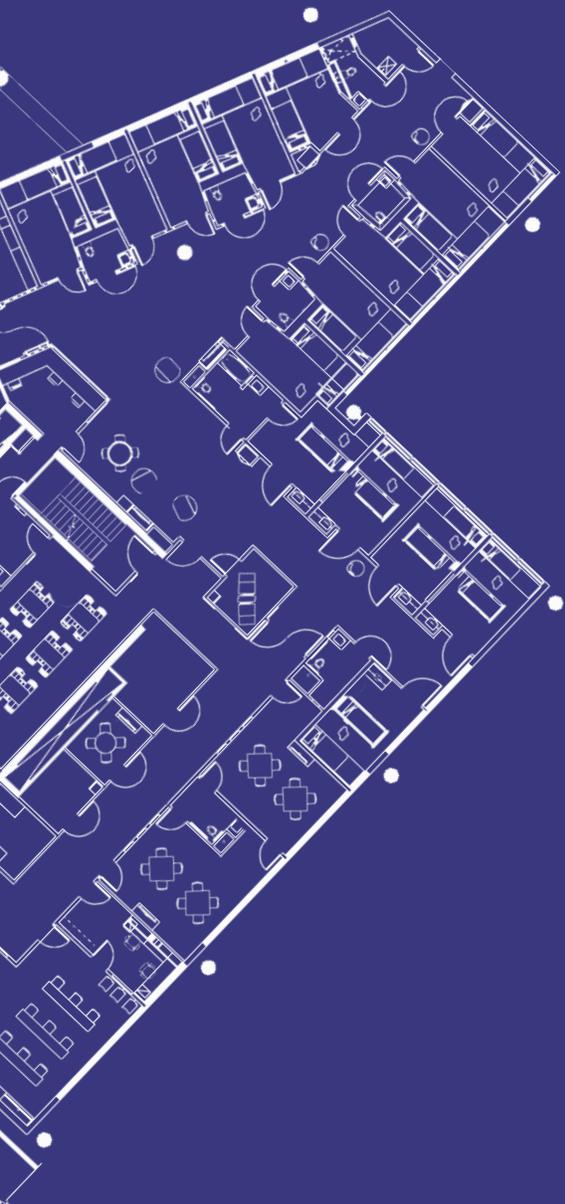
2.LITERATURE REVIEW

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This literature review addresses design features that are believed to confer positive changes to the mental and behavioral environment. We sought to identify and explore those aspects of design that have been subject to debate in the literature and the industry. Last, we sought to elucidate the areas of design in MBH that would benefit from further research. Interviews, focus group, and surveys were used to explore these issues and are described later in this document.

The following literature summary incorporates and expands on an in-depth review conducted by Shepley and Pasha (2013). Rather than address the entire body of published documentation on behavioral and mental health environments, this research project focuses on issues that have received at least a minor level of substantiation. The following topics were identified by Shepley and Pasha as those having the most (although limited) support in the research literature:

1. Deinstitutionalized and Homelike Environment
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2.1. Deinstitutionalized and Homelike Environment

"...the mentally ill need what we all need—an ordinary world. Their world should resemble the world they recognize as normal when they are in their most normal periods. How else will they recognize normal when they are in their most normal periods. How else will they be able to tune themselves back into life as they would like to live it? (Spivak, 1984, p.19).

In Tapak's 2012 ethnographic research she noted the desire of children being treated in a behavioral health facility to be in an environment that was residential in quality, although patients often see behavioral and mental health environments as institutional. For example, in the evaluation of environmental

design factors in a substance abuse facility, the hospital-like environment of the facility reminded clients of treatment and disease (Grosenick & Hatmaker, 2000). Likewise, in a post-occupancy evaluation by Potthoff (1995), it was found that adolescents in a rehabilitation facility were highly dissatisfied by the institutional character, lack of comfort, and lack of items that suggested a homelike environment.

Providing a definition of deinstitutional or homelike environments has been a challenge for designers and researchers. Many return to the notion of home as the place where we are provided choice and control rather than trying to define it as having a particular aesthetic. Csikszentmihalyi and Rochber-Halton (1981) define home as a place that conveys freedom and control of one's life.

Regarding the substance of a homelike environment, Spivak hypothesizes that some portion of 13 characteristics of a healthy environment must be provided in a residential mental health facility. These characteristics, which are summarized in Figure 2.1, are not always practically achievable in a psychiatric care facility (e.g., mating and competing), but they set the stage for what institutions might reach for at a conceptual level.

Tasks	Activities
Shelter	Elemental protection; protection for nesting; separation from aggression, threat, social contact and aggression; emotion
Sleep	Neurophysiological process, diminished stimulation, recover, rest, birthing, maternal & infant care, death
Mate	Courting, bonding, copulation, affection, communication
Groom	Washing, interactive grooming
Feed	Eating, drinking, communicating, socializing, feeding others
Excrete	Excreting, marking of territory
Store	Storing food, hoarding
Territory	Thinking, meditating, considering, waiting, sentry, protecting, observing
Play	Motor activities, role testing, rule violating, imagination, exercise, creating, exploration, dominance testing, synthesizing
Route	Checking perimeter, defining territory, motor experiences, social control

Meet	Communicating, leading, dominance testing, worship, meditation, cosmic awe, moral issues
Compete	Dominance testing, competition, defense, aggression, mating, conflict
Work	Gathering and hunting, earning, constructing, making

Figure 2.1: Essential characteristics of a home environment (Spivak, 1984)

The issue of homelike, deinstitutionalized, and flexible environments has been raised in several publications. Apart from Spivak's activity-based definition described above, homelike environments can be defined as those that utilize cheerful and non-institutional materials, provide privacy and relief from mechanical and other hospital-related sounds, and give patients control over lighting, radio, and TV (Carr, 2011). Researcher caution us that 'homelike' in the traditional sense might not be desirable due to the history of patients who have negative associations with the aesthetics of these environments.

One approach would be the addition of plants. Devlin (1992) found plants to be the most positive addition to a ward, where the presence of nature broke the monotony of the institutional environment (Devlin, 1992). Designers of other healthcare environments advocate for a deinstitutionalized setting: In a study at an AIDS treatment center, the presence of softer, more home-like furniture in lieu of damage-resistant materials was considered visually comforting (Shepley, Frohman & Wilson, 1999).

Ulrich et al. (2012) noted that when a deinstitutionalized environment was included in a bundle of amenities, the need for restraints decreased. Wilson, Soth, and Robak (1992) noted that smaller-sized groups, which reflect a structure more similar to homes, had reductions in vandalism and other undesirable behaviors. Last, Whitehead, Polsky, Crookshand, and Fik (1984) found a deinstitutionalized environment may have contributed to clinically desirable behaviors when compared to the predecessor environment. One of the primary steps in deinstitutionalizing a behavioral health environment is reducing the boundaries between staff and patients (Firth, 2004). Other design recommendations by Philbrook (1980) emphasized reducing the number of patients per cluster.
A homelike environment extends beyond the building itself to the institution's site. The difference between private and public facilities in this regard is clear. In a 1980 study by McLaughlin and Boerger, they found that all private facilities were located in landscaped campus plans, while only two of the 37 public hospitals were part of such an arrangement.

2.2. Orderly and Organized Environment

Order and organization are often recommended in an inpatient unit environment. Bartlett (1997) notes that the physical environment can be chaotic and disorganized, which results in individuals reacting in negative ways, or it can be

clear and support direction. Schjødt, Middelboe, Mortensen, and Gjerris (2003) used the Ward Atmosphere Scale (WAS) to measure staff and patient evaluation of the environment. While the WAS tool focuses on the social environment, one of the factors that is included is "order and organization," which is easily parlayed to reflect the physical environment. Order, organization, and support (WAS factors) predicted satisfaction in a study by Middelboe, Schjodt, Byrsting, and Gjerris (2001).

Eklund and Hansson (2001) used the Community Programs Environment Scale to measure trainee satisfaction and motivation in a patient ward. This scale also uses order and organization as a dependent variable. These factors were among the most crucial in supporting satisfaction.

2.3.   Well-Maintained Environment, Furniture, and Landscaping

A desire for higher quality maintenance of the overall environment, furniture, and landscaping has been expressed. Grosenick and Hatmaker (2000) surveyed staff in a drug rehabilitation facility and determined that well-maintained, comfortable lounge furniture was among the conveniences that were perceived by 82.7% of staff as impacting treatment goals. Timko (1996) includes 20 items related to physical amenities, attractiveness, and comfort on their Physical and Architectural Characteristics Inventory (PACI). In this research more social-recreational aids, physical amenities, and staff facilities were associated with a higher level of physical attractiveness. Christenfeld, Wagner, Pastva, and Acrish (1989) noted a decrease in patient violence in a renovated ward.

Potthoff (1995) found that furniture and finishes related to satisfaction in three rehabilitation facilities that underwent a post-occupancy evaluation. The most highly evaluated facility was characterized by quality furnishings and light-colored wood, "jeweled-toned" fabrics, carpeting, and artwork. Holahan and Saegert (1973) found that more positive attitudes were associated with a remodeled ward that had new furniture and bedspreads, blue accent walls, and painted doors.

Staff is impacted as well. Christenfeld, Wagner, Pastva, and Acrish (1989) conducted a pre- and post-occupancy of two wards that included improvements in finishes and furnishings and found more positive staff mood and lower staff unscheduled absence. Staff did not report improvement in patient functions, but found that patients experience improvements in self-image and increased satisfaction.

2.4.   Visual or Physical Access to Nature

Case studies reinforce the hypothesis that the outdoor environment is important to patients, staff, and visitors in the psychiatric milieu (Perkins, 2013). A relationship with the physical environment is a common objective for contemporary design teams. Paget and White (2004) discuss how they incorporate access to nature in the Community Housing and Therapeutic organizations in England.

According to Bailey (2002) access to outdoor recreational activities is needed for appropriate physical, psychological, and cognitive development. This is particularly true for adolescents who may not have had the chance to engage in developmentally appropriate play as children. Erikson (1963) hypothesized that difficult childhood issues might be resolved through play, and that outdoor play areas such as sandboxes and water features can be used as therapeutic tools. Shepley (1995), in interviews in a psychiatric facility, found that children, in imagining the ideal residential facility, expressed a desire for outdoor play areas and windows. Nature references appeared prominently in drawings the children generated regarding the proposed unit. (See Figure 2.2.)
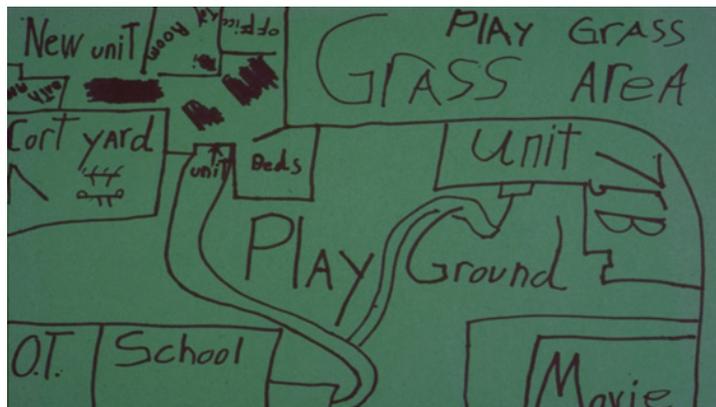
Figure 2.2: Child's drawing of ideal psychiatric inpatient unit (Shepley, 1995)

Ulrich, Bogren, and Lundin (2012) examined the impact of a combined group of environmental features on aggression, including access to nature, and found a reduction in the use of restraints. Window views were among the environmental features that were introduced in the new facility.

In their 2013 review of literature, Wagenfeld, Roy-Fisher, and Mitchell found no peer-reviewed article that connected positive health outcomes in veterans with PTSD to access to healing nature. However, they used available literature on healthcare environments to conceptualize a model to suggest benefits of access to nature for this unique population.

PTSD criterion	Treatment concept	Design features
Stressor	Adaptation level and sense of control	Public space that "affords" options for degrees of social interaction
Recollection	Nature and positive distraction	Water, flora, and fauna
Avoidant	"Soft" fascination	Distant views of "soft" landscape
Hyperarousal	Social interaction	Picnic areas, barbeque pits, basketball courts and smoking areas
Duration	Managed graded stressors	Physical courses with increasing levels of challenge
Functional significance	Meaningful activities	Naturalistic settings supporting service dog training, sustainable farming, physical/ psychological rehab

Figure 2.3: PTSD criteria, treatment concept, and supportive outdoor design features (Wagenfeld, Roy-Fisher & Mitchell, 2013)

2.5.   Damage-Resistant Furnishings

Davis, Glick, and Rosow (1979), based on the experience of renovating a psychiatric unit, recommend choosing furnishings that resist damage and are easily replaced and repaired. Sturdy furniture is among the attributes recommended in the Whole Building Design Guide produced by the National Institute of Building Sciences (Carr, 2011). Shepley, Frohman, and Wilson (1999) found comfortable furniture to be very important to the psychological support of patients in a facility for persons with AIDS.

2.6.   Maximum Daylight

The incorporation of daylight is among the important factors in a therapeutic milieu (Davis, 1979; Gutkowski & Guttman, 1992). Maximizing the use of daylight is one of the primary goals in a Planetree psychiatric unit (Turlington, 2004). Ulrich et al. (2012) included well-illuminated interior spaces as one of the components of "bundled" amenities that contributed to reduced aggression. According to research in a state geriatric psychiatric facility, the introduction of improved lighting in conjunction with other modifications resulted in improved behavioral changes, particularly by those persons who were involved in the design process (Bakos, Bozic, Chapin, et al.,1980).

2.7.   Staff Safety/Security

Staff safety and security is a function of both operational and physical environmental features. Forster, Cavness, and Phelps (1999) determined that operational modifications positively reduced the hospital's use of restraints as well as the number of staff injuries. Similarly, Martin (1995) found that while aggressive events did not decrease in number, they were less severe and reduced absences of staff. Salerno et al. (2012) note that concern for patient self-destructive or aggressive behavior are the primary social issues for staff in a psychiatric patient ward. Environmental aspects such as poor environment, locked doors, and restraint procedures involving a high risk of aggression set the primary challenges for the community. Physical restraint is perceived by some to be a "necessary evil" (Perkins, Prosser, Riley, & Whittington, 2012) although the use is highly debated.

2.8.   Private versus Shared Bedrooms/Reduced Patient Density

Bailey (2002) notes that patients need a special place for an emotional attachment to be fostered and ownership to be expressed. This space serves the purpose of a retreat to which an individual can withdraw that is characterized by their particular personality. Having a room that can be decorated with appropriate objects that help them to explore their identity offers patients the security and comfort that is developmentally appropriate and therapeutic (Bailey, 2002).
Multiple authors recommend providing private patient rooms (Forster, Cavness, & Phelps, 1999; Lynch, Plant, & Ryan, 2005; Martin, 1995; Salerno, et al., 2012), or lower density patient rooms, such as large two-person bedrooms (Wolfe, 1975; Wilson, et al., 1992; Turlington, 2004; Izumi, 1968; Chou, et al., 2002; Ulrich, et al., 2012), although research is not available that demonstrates a reduction in suicide or aggression in association with private, semi-private, or other-sized rooms. Bowers, Dack, Gul, Thomas, and James (2011) found that the primary factors influencing inpatient care are more focused on protocols such as intermittent observation and checks. However, the layout of an environment can facilitate these activities.

2.9.   Patient-Staff Interaction/Observation

Caregivers recommend providing areas that are suitable for private one-on-one interaction between staff and patients. Tyson et al. (2002) compared social interactions in two new wards measuring nurse staff behavior, self-ratings, and job satisfaction. The new wards were linked to positive behavioral changes and decreased burnout, without a change in job satisfaction. (See Figures 2.4 and 2.5.) However, the authors noted that the organization needed to evolve as well if satisfaction is to be impacted.
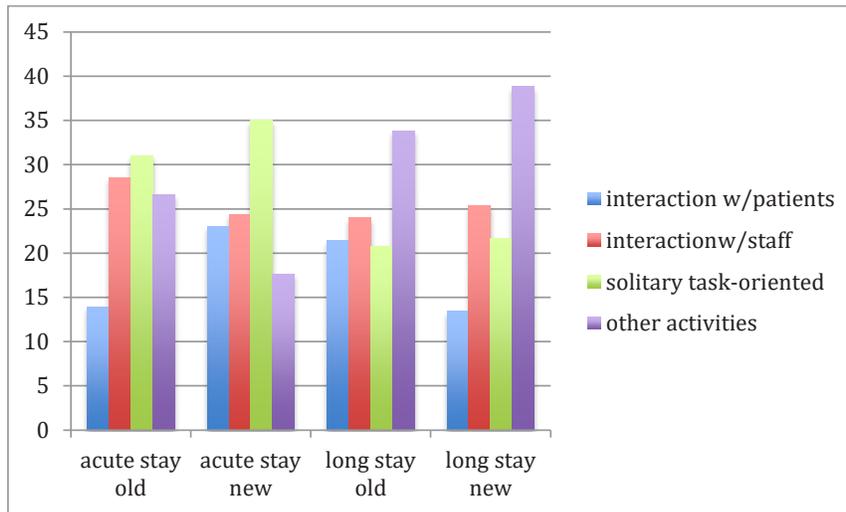
Figure 2.4: Social activities by nursing staff in new and old facilities (Tyson, 2002)
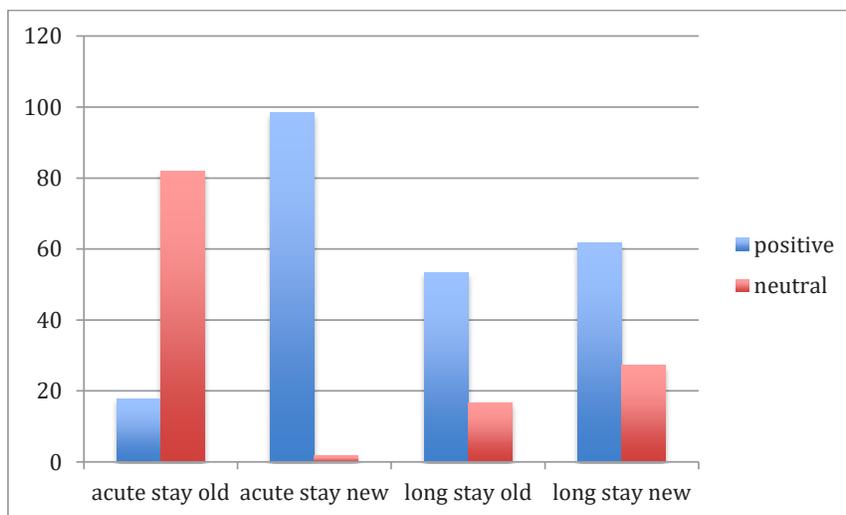
Figure 2.5: Positive and neutral staff interactions with patients in new and old facilities (Tyson, 2002)

2.10. Social Interaction

Gutkowski, Ginath, and Guttmann (1992) found that small relocations of furniture had important impacts on social interactions. Multiple designers and researchers provide dayrooms and common areas that encourage social interaction and promote a sense of community (Turlington, 2004; Sidman & Moos, 1973; Gutkowski, Ginath, & Guttmann, 1992; Devlin, 1992; Davis, et al., 1979).

According to Fairbanks et al. (1977) 25.3% of social behavior takes place in the halls, followed by the nurse station (30.6%), dayroom (35.8%), activity space (44.8%) and dining (46.5%). Some of these relationships were also confirmed by McGuire et al. (1977).
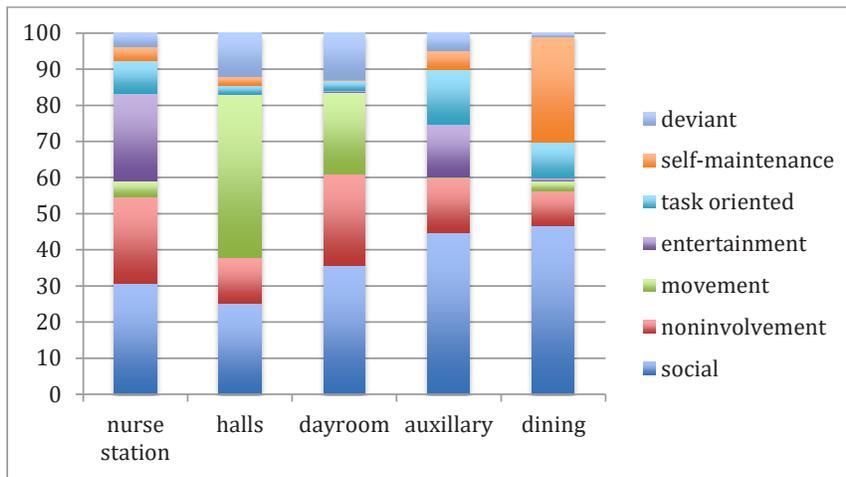
Figure 2.6: Patient behavior by room type (Fairbanks et al., 1977)

Timko (1996) found that the provision of social-recreation aids (such as group tables) was correlated with program outcomes regarding engagement in self-initiated activities. Investigating social behavior of schizophrenic patients, Holahan and Saegert (1973) found patients socialized more in a newly remodeled ward with bright colors compared to a ward with old and worn furniture and a dark and dull color scheme. They observed no difference in levels of nonsocial active behavior between the two wards. (See Figure 2.7)
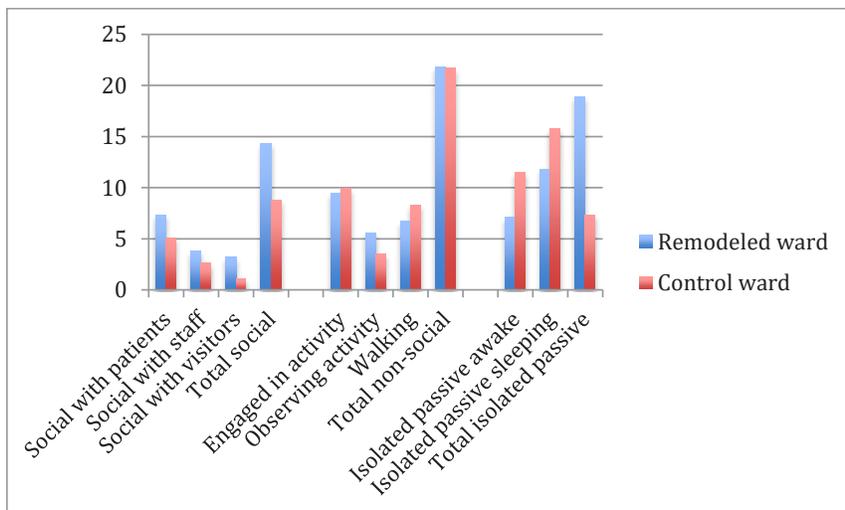
Figure 2.7: Impact of remodeled ward (Holahan & Saegert, 1973)

2.11. Autonomy and Spontaneity

Several authors suggest that the ward environment should support patient autonomy and spontaneity. These terms are closely aligned with Spivak's design goals discussed previously (Figure 2.1).

Autonomy and spontaneity are two of the 10 factors on the Ward Atmosphere Scale, a tool that has been used in the study of dozens of facilities. This tool has been tested effectively in multiple cultures, with the exception of Russia, in which autonomy was found to be inappropriate (Sorlie, Parniakov, Rezvy, & Ponomarev, 2010).

According to researchers, patients subjected to coercive measures perceived less autonomy and practical orientation (Middelboe, Schjodt, Byrsting, & Gjerris, 2001). A study by Lynch, Plant, and Ryan (2005) demonstrated that competence and autonomy impacted staff attitudes and treatment of patients; and satisfaction on the job was found to be related to psychological needs rather than external demands. Cleary, Hunt, and Walter (2009) conducted a patient evaluation of a ward after relocation and added "the level of freedom in the ward" as one of the questions. On a scale of 1 to 5 (5 being high satisfaction), patients and staff ranked freedom as 2.57 and 2.45 respectively. It was the second lowest rank by patients and the lowest ranked item by staff.

2.12. Suicide-Resistant Furniture, Furnishings, and Equipment

Watts et al. (2012) assessed the effect of identification and reduction of hazards on suicide in Veteran's Administration facilities. The items on the checklist included making HVAC duct covers flush with the wall, as well as removing possible hazards in bedrooms, baths, seclusion rooms, entrances, dining areas, staff workspaces, and nurse stations. As a result of these interventions there was a significant reduction in suicides.

Designers, patient care staff, and researchers recommend avoiding anchor points in the bathroom, such as showerheads and breakaway towel hooks, and architectural elements that can be used as weapons. According to Carr (2011) the following are safety considerations:

1. Tamperproof electrical, plumbing, and mechanical devices
2. Break away shower bars and rods, no clothes hooks
3. No jumping opportunities
4. Staff-controlled exits and entrances
5. Patient bedroom doors that can readily be opened by staff in emergencies
6. Laminated glass windows
7. Fiber-reinforced gypsum board walls
8. Safe seclusion rooms, including outward opening door with no inboard hardware
9. Appropriate locations for grab bars and handrails
10. No door knobs or handles
11. Solid material ceilings

Jeffers (1991) reminds us that observational protocols are critical to providing a safe environment for patients.

2.13. Mix of Seating

Studies on the impact of seating are among the earliest behavioral mapping exercises in mental heath facilities (e.g., MacDonald, Davidowitz, Gimbel, et al., 1982; Peterson, Knapp, Rosen, et al., 1977; Sommer & Ross, 1985; Stahler, Frazer, & Rappaport, 1984). Providing a mix of seating arrangements that support social interaction among different groups of patients has been recommended by designers, although associated research has not always been supportive. Minde, Haynes, and Rodenburg (1990) note that the lack of consistent findings in terms of modifications may be due to lack of involvement of patients and staff in the planning process.

Baldwin (1985) examined the impact of a short-term intervention in furniture arrangements in a dayroom in a high-security hospital in the UK. During two 2-week periods, seating configurations were provided each day together with recreational activities such as cards. The intervention resulted in reduced use of seclusion rooms, reduced casualty incidents, increase in behavioral award points, improvements on relationship subscales, and minor decreases on the personal development subscales.

2.14. Smoking Rooms

Smoking can create pollution problems in psychiatric and other healthcare settings. Still, there has been some support for smoking rooms (e.g., Salerno, Forcella, Di Fabio, Figà Talamanca, & Boscolo, 2012), as the stress associated with surrendering the habit has the potential to increase patient anxiety. Shepley et al.,(1999) found that patients and staff supported the presence of smoking in designated areas in an AIDS facility as a means of giving patients choice and control.

2.15. Nurse Station Observation

Carr et al. (2011) comment on the need for maximum supervision of the inpatient unit. In a pre- and post-evaluation of a facility, the objective was to increase interaction among staff and patients, but researchers found the opposite result (Whitehead et al., 1984). The researchers noted that nurses are concerned that patients abuse the opportunity to interact with staff when the nurse station is open, although their findings contradicted this. They noted that the openness of the design encouraged staff to vacate the station and interact more frequently with patients and facilitated staff observation of the day room and spaces used by patients from the nursing station (Whitehead et al., 1984). Patients in this facility reported that an open nursing station makes them feel better.

The open nurse station is one of the tenets of Planetree (Turlington, 2004). In another pre- and post-occupancy evaluation Christenfeld et al., 1989 describe

a nurse station that was relocated for increased supervision of the dayroom, entry, and adjoining carpet area, and which resulted in improved staff mood level, reduction in unscheduled absences, improved patient self- image, provided greater satisfaction and led to less violence. Gross et al. (1998) found that nursing stations that are directly accessible to dayrooms with a large observation window result in more frequent access to patients.

The issue of nurse safety is a critical one. Chou et al. (2002) noted that a high level of violence occurs at nurse stations and is second only to patient bedrooms as the place of violent activities. (See Figure 2.8).
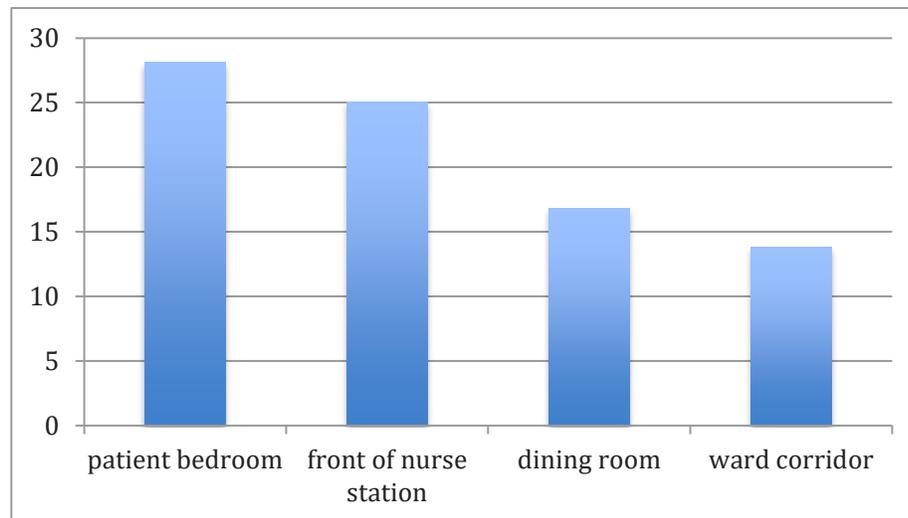
Figure 2.8: Location of assaultive behaviors (%) (Chou et al., 2002)

Ulrich et al. (2012) argue that the design and location of nursing stations influence proximity to patients and the resultant quality of staff-patient interaction. They also found reductions in the use of restraints when a more open nurse station was part of a bundle of environmental features.

2.16. Indoor/Outdoor Therapy

Ulrich et al. (2012) also included nature window views, accessible gardens, and nature art in the bundle of amenities intended to reduce aggression. Providing indoor and outdoor spaces for therapeutic activities was encouraged. Shepley (1995) allowed children to draw their vision of the ideal residential unit and noted that almost all drawings included nature content.

2.17. Staff Respite

It is important to include spaces for staff members to engage in consultation and therapy.

Significant stress is placed on psychiatric staff due to "overcontrol" activities

(such as prevention of self-destructive behavior) and restraint procedure events (Salerno et al., 2012). Chen, Huang, Hwang, & Chen (2010) studied health-related quality of life relative to workplace violence against nurses by mental health patients. Poor quality of life was associated with an increased number of violent events. Timko (1996), using the Physical and Architectural Characteristics Inventory (PACI), found a correlation between staff facilities and reduced patient discharge to independent living.
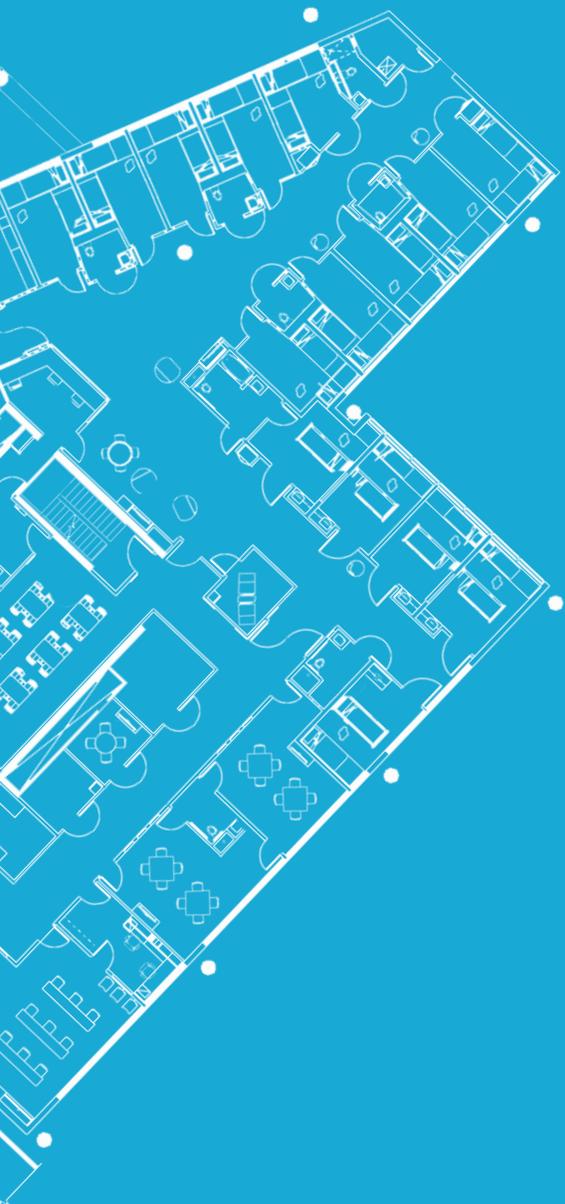
3.METHODOLOGY

3.   METHODS

This research project consisted of four primary methods: snowball search, interviews, focus group, and surveys. The overall process was implemented in seven phases, including the pilot studies. A draft version of the survey tool, entitled the Psychiatric Staff Environmental Design (PSED), was developed based on the previous literature and used as the topic of discussion for the interviewees who were identified by a snowball search process. The interviews were followed by a focus group that also served as subjects for the pilot study. Based on those conversations, the survey was revised and distributed to psychiatric nursing organizations and a facility. A detailed summary of the process is provided in Figure 3.1.

Institutional Review Board permission was obtained from Cornell University and updated twice as new subject groups were added.

1.)   Conduct **snowball search** to identify designers, clinicians and academics specializing in mental and behavioral health who will serve as interviewees

↓

2.) Create the **subject topics for the interviews** based on literature review.

↓

3.) Conduct **interviews** with designers, clinicians and academics to challenge of validate survey topics and generate the pilot **PSED survey.**

↓

4.)   Distribute **pilot PSED survey** and make modifications based on results.

↓

5.)   Conduct **focus group** and make modifications based on results.

↓

6.) Revise **PSED survey** and distribute to psychiatric staff.

↓

7.) Analyze data, generate guidelines, modify PSED and disseminate results.

Figure 3.1: Research process

3.1. Snowball Search

In order to establish a group of experts who might be able to provide input on a survey that evaluates the physical environment, we used a snowball search process. Snowball sampling is a valid technique for establishing a pool of subjects (Noy, 2008; Sedgwick, 2013). The researchers started with a pre-known group of experts and contacted those individuals regarding who they consider to be experts, and those experts provided additional names. After four iterations, the field of possible experts was relatively saturated. In other words, many of the same names were repeatedly raised.

3.2. Interviews

3.2.1. Subjects

The 17 final interviewees were from a range of professions within the field of mental and behavioral healthcare and design. Represented professions included psychiatric nursing, academia, architecture, and administration of hospitals or facilities.

3.2.2. Tools

Interviewees were asked to confirm or challenge the importance of a set of 25 issues in facility design, which were informed by a previous review of the literature concerning mental and behavioral facility design conducted by Shepley and Pasha (2013) (see Figure 2). Questions included the opportunity for additional comments and demographic data. These items were those for which a baseline of research had been conducted. The researchers felt that building on this foundation would be more effective than initiating new topics of research. The script introduction and topics are summarized in Figures 3.2 and 3.3.

The purpose of this focus group/interview is to help formulate a survey that can be distributed to administrative, clinical, and facility healthcare staff to evaluate the quality of mental and behavioral health environments. You have been asked to participate due to your experience with mental and behavioral health environments. The majority of the questions will be specific, but you are free to elaborate on related issues as necessary. At the end of the discussion you will have the opportunity to make additional comments.

Please confirm that you have signed a consent form. Your identity will be confidential. The interview will take approximately 30 minutes and the focus group will take about 1 hour.

Researchers have identified several topics that are critical to mental and behavioral health facilities. We would like you to evaluate these topics and confirm whether you believe they merit inclusion in our survey. The respondents will be asked about the attributes of each environmental element and the importance of these attributes. Do you have any questions?

Figure 3.2: Script introduction

Impact on patients and staff in inpatient and outpatient settings

1. Deinstitutionalized and homelike environment
2. Orderly and organized environment
3. Well-maintained environment
4. Damage-resistant and attractive furniture
5. Quality landscaping
6. Visual access to nature
7. Physical access to the outdoors for therapeutic activities
8. Maximum use of daylight; well-illuminated interior spaces

Impact on staff in inpatient and outpatient settings

9. Enhanced staff safety and security
10. Spaces for staff mental health consultation and therapy

Impact on inpatients

11. Private patient rooms
12. Reduced inpatient room density
13. Patient bathroom locations
14. Dayrooms that encourage social interaction and community
15. A mix of seating arrangements
16. Environment that supports autonomy and spontaneity
17. Private areas for one-on-one interaction between staff and patients
18. Nursing stations to facilitate observation of patients
19. Indoor spaces for therapeutic activities
20. Smoking rooms
21. Suicide-resistant features

Additional comments

22. Additional comments regarding inpatient facilities
23. Additional comments regarding outpatient facilities

Demographic information

24. Please provide your job title
25. How long have you served in your current position?

Figure 3.3: Topics addressed in interviews

3.2.3 Procedure

Interviews with participants were conducted via landline phone out of an office in Ithaca, NY. Use of video software was avoided to maintain participant confidentiality. Each interview was allotted a maximum 35 minutes from start to finish, and was conducted by the principal investigator. Sixteen of the 19 pilot and final interviews included the participation of one or two research assistants, who took notes on an online document. Interviewees were made aware of their presence.

The first two interviews served as trial runs for future interviews. Both trial interviewees were given a preliminary version of the proposed survey topics. The first interview was conducted over the phone, and the second one in person. Following feedback from the interviews, the interview questionnaire was simplified to exclude follow-up questions. The PI contacted the participants by phone or email to schedule the interview and sent a copy of the issues to be discussed to each (see Figure 3). Seventeen interviews, excluding the two trial interviews, were conducted.

Interviews were recorded on two devices in case one of the devices failed. Either two versions of QuickTime player [Version 10.3 (727.4)] or one version of QuickTime player and an external hand-held recording device were used. The recordings of the interviews were used to create interview transcripts. Seven interviews were transcribed by two research assistants, while the remaining 12 interviews were transcribed by a professional transcription company in Ithaca, NY.

3.2.4. Qualitative Analysis

Once the interview transcripts were obtained, data was collected and analyzed using the qualitative analysis method described by Lincoln and Guba (1985) in Naturalistic Inquiry. Each quotation containing a distinct idea or opinion concerning a design aspect was highlighted and transcribed onto a note card. The note card was labeled on the back with the umbrella topic to which the quote pertained. Quotations were extracted from all 16 interviews.

After all the note cards had been collected, they were grouped into piles based on common umbrella terms. All cards with the word "bathrooms," for example, were grouped into one stack. Several note cards concerning topics outside the realm of mental and behavioral facility design were grouped into a miscellaneous pile, which was excluded from further analysis.

Cards were grouped into a total of 30 stacks, each stack concerning a distinct design aspect of mental and behavioral health facilities. (See Figure 3.4.) The stacks were then further divided by opinion expressed on the card. For example, those cards that suggested that private bathrooms were critical in mental health facilities were grouped together. Such note cards, which shared the same sentiment, were given a common colored pencil mark on the front. The contents of the note cards were codified in a notebook. Each umbrella topic, such as

"bathrooms" was recorded in the notebook. Under each of these headers were bullet points paraphrasing the comments regarding the specific design topic. Under the header "bathrooms," read the phrase "distinct advantage to private bathrooms." At the end of this phrase was a number indicating the number of cards expressing this sentiment, in this case nine. This number was highlighted with a colored pencil mark akin to the mark on the note cards. This codification allowed the content and frequency of remarks to be easily deciphered. (See Figure 3.5.)

Figure 3.4: Note card groupings during qualitative analysis

Figure 3.5: Notebook coding

3.3.   Focus Group

3.3.1   Subjects

The focus group critique took place in an architectural office in Boston, MA. Participants included the principals/architects in two design firms, a senior staff architect, and a senior staff interior designer. All individuals are specialists in healthcare design. Also present were the PI and a student research assistant. Four participants meet in person and the other two were connected to the meeting via WebEx.

An additional participant, a specialist in behavioral healthcare facilities, was unable to attend, although she was one of the pilot interviewees and was able to provide input during a personal interview.

3.3.2   Tools

Participants were given a copy of the proposed questionnaire in advance.

3.3.3   Procedure

Focus group members were given approximately 20 minutes to complete the survey and then 90 minutes to provide feedback. The feedback ranged from comments concerning typos and redundancy to the purpose of the survey itself. A research assistant was present during the meetings to note the comments.

3.3.4   Qualitative analysis

Comments were reviewed immediately after the focus group and modifications were made regarding the content of the survey. Rather than Naturalistic Inquiry, a more informal analysis was conducted using traditional methods of ethnographic summation. Two researchers reviewed the notes from the meeting and came to an agreement about the input.

3.4   Survey

3.4.1   Subjects

Subjects were recruited from five psychiatric nursing organizations and a large facility in New York City. The organizations were contacted by email and the individuals agreed to participate. The membership for each of the five organizations was the International Society of Psychiatric-Mental Health Nurses (500 members), Horatio (Europe) (50 members), the American Psychiatric Nurses Association (10,000 members), the Canadian Federation of Mental Health Nurses (1,000 members) and the Australian College of Mental Health Nurses (3,500 members). The NYC mental health facility distributed the questionnaire to 43 staffers.

3.4.2   Tools

The analysis of the note cards informed the Psychiatric Staff Physical Environment (PSED) survey. Based on the results of the qualitative analysis, significant topics in mental and behavioral facility design were addressed by the survey. In addition, respondent demographic questions were added to the survey to assess job title, experience, location, and other variables.

The survey questions followed a generalized sequence. For each design topic, three questions were asked. The first asked respondents to rank the importance of design qualities pertaining to a specific design topic, such as landscaping. The second question asked respondents to rank the importance of these topics, and the third asked respondents to assess their current facility's ability to address the topic. Once all the topics raised during interviews had been addressed on

the survey, the survey questions were given to a focus group for critique. See Appendix A for a copy of the survey.

SOURCE OF QUESTIONS		REVISED SURVEY
SHEPLEY/PASHA	**INTERVIEW/FOCUS GRP**	
All Facilities		
1. Deinstitutionalized		Deinstitutionalized
2. Orderly organized		Orderly organized
	Attractive/aesthetic	Attractive / aesthetic
3. Maintenance furniture, and landscape		Well-maintained
4. Damage-resistant furniture		Damage-resistant furniture
5. Quality landscaping		Quality landscaping
6. Visual access to nature		Visual access to nature
7. Physical access to nature		Physical access to nature
	Attractive/comfortable furniture	Attractive furniture/comfortable furniture
	Good electric lighting	Good electric lighting
8. Maximum daylight		Good day lighting
	Noise control	Noise control
9. Staff safety/security		Staff safety/security
10. Staff support		Staff support
	Impact of work experience	Impact of work experience
Inpatient Facilities		
11. Private rooms/12. Low density rooms/13. Private bathrooms		Private rooms/baths
14. Social interaction/community		Social interaction
15. Mix of seating		Mix of seating
16. Autonomy spontaneity		Autonomy spontaneity
17. Patient-staff interaction/observation		Patient-staff interaction/observation
	Positive distraction	Positive distraction
	Staff respite	Staff respite
18. Nurse station observation		Nurse station observation
19. Indoor/outdoor therapy		Indoor therapy
20. Smoking rooms		Smoking areas
21. Suicide-resistant FFE		Suicide-resistant features
	Impact of length of stay	Impact of length of stay
	Impact of unit size	Impact of unit size

Figure 3.6: Source of questions for the survey

3.4.3. Procedure

Once necessary changes were made, a URL for the activated Qualtrics survey was sent out to the five participating nursing and psychiatric organizations. All five organizations distributed the survey to their membership via an online blog or membership letter. To increase the number of responses the researchers approached a large mental/behavioral organization in New York City. Responses were gathered from date August through October, 2015.

3.4.4. Quantitative methods

3.4.4.1 Research issues addressed in the survey

Multiple relationships were investigated in this study, examples of which follow:

- Relationship between demographics and perception of importance or effectiveness (Typical hypotheses: nurses perceive the environment to be less effective and more important than doctors do; more experienced nurses perceive the environment to be less effective and more important.)
- Relationship between importance and effectiveness (Hypothesis: the greater the importance, the lower the effectiveness.)
- Relationship between effectiveness and importance among different types of facilities (Hypothesis: different types of facilities will have different effectiveness and importance.)
- Relationship between importance of different environmental characteristics within categories and overall (Hypothesis: some characteristics will be found to be more important than others.)
- Relationship between effectiveness of different environmental characteristics within categories and overall (Hypothesis: some characteristics will be found to be more effective than others, e.g. safety rather than nature.)

A detailed summary of the variables that were examined is provided in Figures 3.7, 3.8, 3.9, and 3.10. Figure 3.11 graphically summarizes the relationships described in Figures 3.9 and 3.10.

3.4.4.2 Variables and data analysis

The data analysis was built around the following demographic, independent, dependent and moderating variables. Apart from the descriptive analysis, multiple questions were analyzed inferentially. The Cornell University Statistical Consulting Unit provided support in data analysis and interpretation. The data was cleaned and then processed using IBM SPSS Statistics, Edition 23. It was used to analyze the data in the form of descriptive statistics, including cross tabulations. Additionally, Chi-Square tests of association and nonparametric tests (Mann-Whitney U and Kruskal-Wallis one-way ANOVAs) were performed.

Gender descriptive analysis
Facility country   descriptive analysis
Facility type (IP, ER, OP)   descriptive analysis
Link to hospital   descriptive analysis
Public versus private   descriptive analysis
Type of disorder   descriptive analysis
Predominant population (age)   descriptive analysis
Total beds   descriptive analysis
ER holding rooms   descriptive analysis
Counseling rooms   descriptive analysis
Private rooms descriptive analysis
Private bathrooms   descriptive analysis

Figure 3.7: All facility types; demographic and facility data analyzed descriptively

Job title x importance (for broad All and IP questions) + descriptive analysis
Years of experience x importance (for broad All and IP questions) + descriptive analysis
Facility environment (urban/rural) x visual access to nature & physical access to nature + descriptive analysis
LOS x importance + descriptive analysis INPATIENT ONLY
Beds per unit x appropriate + x importance + descriptive analysis INPATIENT ONLY

Figure 3.8: All facility types; moderating/independent variables analyzed descriptively and inferentially regarding importance and appropriateness (beds/unit)

Deinstitutionalized x importance and x effectiveness
Furniture/finishes similar to apartment compared to the other items in this list
Furniture/finishes similar to a hotel compared to the other items in this list
Environment that allows for choice/control compared to the other items in this list
Spaces that support privacy compared to the other items in this list
Spaces that are comfortable and cozy compared to the other items in this list
Spaces that convey respect towards patients compared to the other items in this list
Welcoming entry experience compared to the other items in this list
Artwork and décor compared to the other items in this list
Orderly and organized x importance and x effectiveness
Absence of clutter compared to the other items in this list
All equipment has designated storage compared to the other items in this list
Navigable/readable space arrangement compared to the other items in this list
Visually cohesive furniture/finishes compared to the other items in this list
Attractive and aesthetically pleasing x importance and x effectiveness
Abstract art compared to the other items in this list
Art depicting nature compared to the other items in this list
Colorful furniture/finishes compared to the other items in this list
Natural complexity with orderliness compared to the other items in this list
Well-designed electric lighting/day lighting compared to the other items in this list
Window views of the outdoors compared to the other items in this list
Well maintained x importance and x effectiveness
Clean floors, walls, and other surfaces compared to the other items in this list
Furniture and finishes in good condition compared to the other items in this list
Properly operating electrical fixtures/HVAC systems compared to the other items in this list
Properly operating equipment compared to the other items in this list
Visual access to outdoors x importance and x effectiveness
Views of pleasant/interesting street life compared to the other items in this list
Views of pleasant/interesting gardens compared to the other items in this list
Views of pleasant/interesting natural landscapes compared to the other items in this list
Physical access to outdoors x importance and x effectiveness
Spaces that support patient safety/security compared to the other items in this list
Pleasant/natural landscapes compared to the other items in this list
Spaces that support group activities compared to the other items in this list
Spaces for one-on-one conversations compared to the other items in this list
Spaces for sitting alone compared to the other items in this list
Other compared to the other items in the above lists
Damage resistant furniture x importance and x effectiveness
Attractive furniture x importance and x effectiveness
Comfortable furniture x importance and x effectiveness
Good electric lighting x importance and x effectiveness
Good day lighting x importance and x effectiveness
Noise control x importance and x effectiveness
Staff safety & security x importance and x effectiveness
Spaces for staff respite x importance and x effectiveness
Attached or adjacent to hospital x importance

Figure 3.9. All facilities; independent variables analyzed inferentially relative to the dependent variables of importance and effectiveness

Staff-patient interaction/patient observation x importance and x effectiveness
  Visual monitoring via camera compared to the other items in this list
  Visual monitoring via windows compared to the other items in this list
  Auditory monitoring compared to the other items in this list
  One-on-one consultation rooms compared to the other items in this list
  Open nurse stations compared to the other items in this list
  Closed nurse stations compared to the other items in this list
Positive distraction x importance and x effectiveness
  Board games, playing cards, etc. compared to the other items in this list
  Books, magazines, newspapers compared to the other items in this list
  Exercise equipment compared to the other items in this list
  Music systems compared to the other items in this list
  Television compared to the other items in this list
  Pet therapy compared to the other items in this list
  Video game systems compared to the other items in this list
  Sports and recreation spaces compared to the other items in this list
Staff respite x importance and x effectiveness
  Exercise room compared to the other items in this list
  Private entrance to facility compared to the other items in this list
  Staff-dedicated outdoor space compared to the other items in this list
  Counseling rooms for staff compared to the other items in this list
  Staff nap room compared to the other items in this list
Social interaction and community x importance and x effectiveness
  Shared group therapy rooms compared to the other items in this list
  Shared group activity rooms compared to the other items in this list
  Shared eating spaces compared to the other items in this list
  Shared outdoor spaces compared to the other items in this list
  Shared sports/recreation spaces compared to the other items in this list
  Designated space for privacy compared to the other items in this list
Autonomy and spontaneity x importance and x effectiveness
  Open access to exercise areas compared to the other items in this list
  Open access to outdoor spaces compared to the other items in this list
  Open access to snack areas or kitchen compared to the other items in this list
  Open access to technology/entertainment amenities compared to the other items in this list
  Open access to spaces that support personal safety compared to the other items in this list
Suicide resistance x importance and x effectiveness
  Anti-ligature furniture, hardware, lighting/ceiling fixtures compared to the other items in this list
  Shared bathrooms or supervised bathroom entrances compared to the other items in this list
  Shared patient bedrooms compared to the other items in this list
  Suicide-resistant materials compared to the other items in this list
  Visibility of patients from nurse station compared to the other items in this list
Other compared to the other items in the above lists
Mix of seating arrangements x importance and x effectiveness
Designated smoking areas x importance and x effectiveness
Direct observation from nurse station x importance and x effectiveness
Indoor space for therapeutic activities x importance and x effectiveness
Private areas for staff-patient interaction x importance and x effectiveness

Figure 3.10. Inpatient facilities; independent variables analyzed inferentially relative to the dependent variables of importance and effectiveness
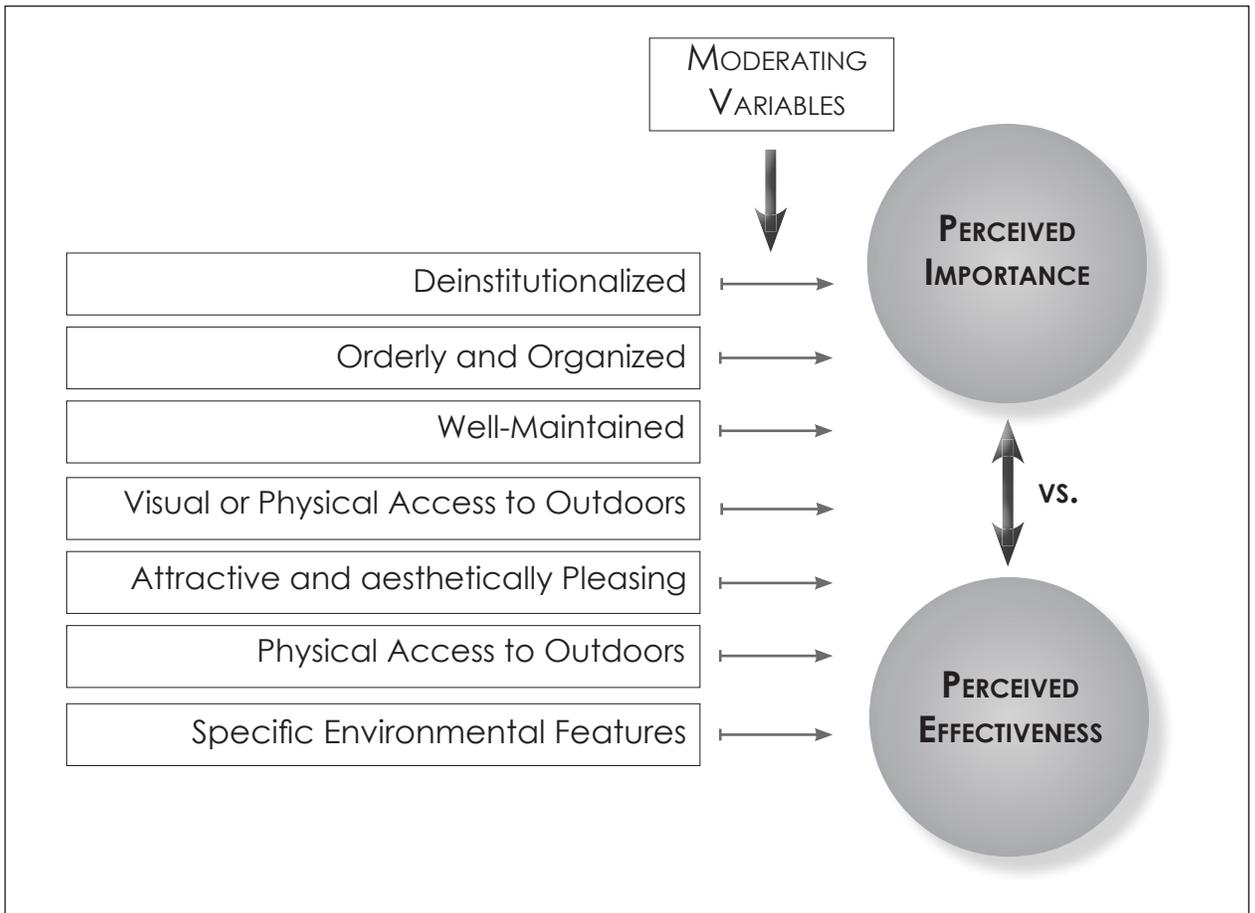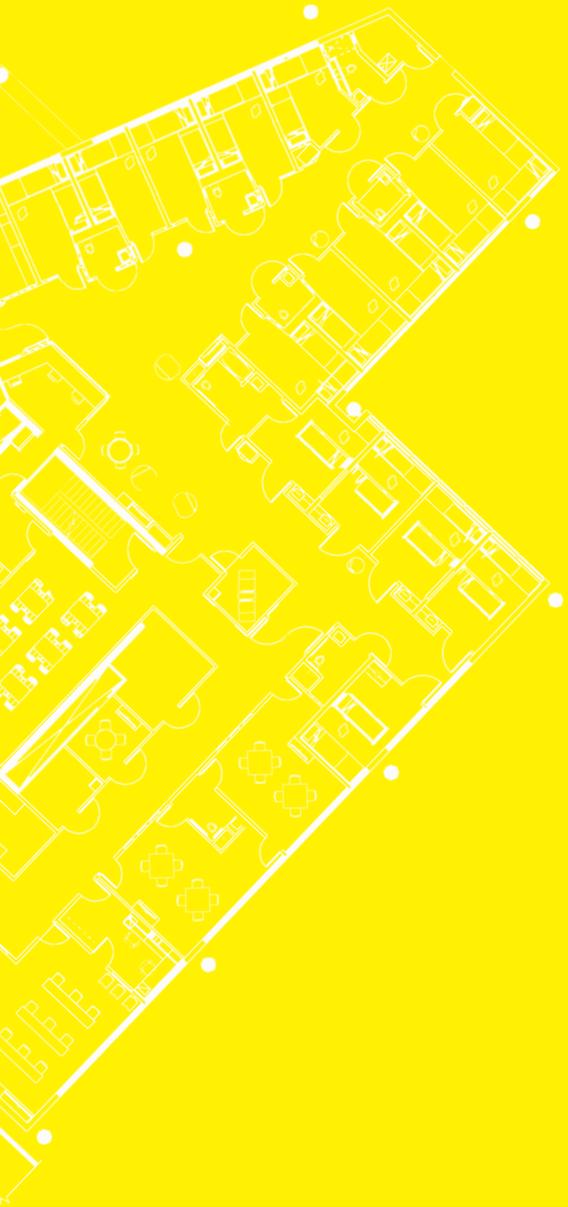
Figure 3.11. Conceptual Framework: graphical summary of the relationships described in Figures 3.9 and 3.10

4. RESULTS

4. RESULTS

4.1. Snowball Interview Subject Sample

The five research team members generated a list of six experts. The six experts on this list ultimately identified 10 more interviewees, who identified 12 more, for a total of 28. The full group also included eleven designers, 13 clinical staffers, and four academic researchers.

Two of the 28 served as pilot interviewees and seven were not accessible by email or did not respond to a request to be interviewed. Of the remaining potential interviewees, seven designers, four academic researchers, and eight clinical staffers agreed to participate. The total number of interviewees was 19, including the two who served as subjects in the pilot phase.

4.2. Interviews

The results of the interviews summarized here parallel the topics outlined in the script for the interview. This section concludes with the additional topics that were raised and later incorporated into the survey, along with recommendations from the focus groups.

4.2.1. Deinstitutionalized and Homelike Environment

The first question in the interview addressed the importance of a deinstitutionalized and homelike environment in a psychiatric setting. Virtually every interviewee thought that this was a good question and a critical aspect of a psychiatric environment (16:1:10; 8:1:11; 4:1:12; 16:1:17-20, and 5:2:1-3; 6:2:1-6; 15:2:11; 6:11:6-9; 6:1:13-15). Some interviewees acknowledged that psychiatric caregivers are sometimes unaware that the environments where they work feel institutional to others (1:12-14; 5:1:14-17).

The definition of "deinstitutionalized" and "homelike" dominated the conversations. One interviewee felt that the two terms are not synonymous (1:1:10-11). Others preferred the concept of homelike to deinstitutionalized, as it was more positive (4:15:22-23 to 4:16:2). Two respondents did not favor the term homelike (5:1:8-9; 7:1:11-13). Several individuals emphasized that the notion of what is homelike varies culturally (13:1:9-11; 11:1:11-17; 5:2:1-3). One said, "Motel 6 is highly appropriate for some populations and highly inappropriate for others..." (13:1:13-15) It has a significantly different meaning for a homeless person (5:1:16-20; 5:2:5-8) than for someone who lives in a home. A designer who specializes in work with the Veterans Administration stated,

> *You're dealing with a population that is probably 25% literally homeless, and at least another 25% are sort of homeless, like they're living in somebody's garage or their relative's basement or some place that would hardly seem like home [to many of us] (5:1:16-20).*

Recommendations on how to achieve a homelike environmental were provided by several respondents. One approach was for environmental richness, represented by a variety of lighting fixtures and a variety of spaces, for example (7:1:16-20). It was noted that a facility need not look like a hospital or a home. One interviewee commented that not everyone embraces the traditional vision of home (16:2:7-13), and that to some this notion of home may even be disturbing. A common sentiment was that the essence of 'home' has little to do with a particular genre of design and more to do with a feeling that is welcoming (16:2:7-13) and friendly (5:1:20-23), balancing hominess and security (3:4:21-25 to 3:5:2), non-threatening and stress-reducing (15:2:13-16). It was suggested that a hotel-like atmosphere might be ideal (16:2:13-17), one that imbues the occupant with a feeling of being protected (16:2:1-7). Indeed, the words 'hospital' and 'hospitality' come from the same root, meaning a place for guests.

4.2.2. Orderly and Organized Environment

The second set of questions in the interview addressed the importance of orderly and organized environments. Many interviewees thought this was an important area for further research (4:1:15-16, 16:2:23–3:3, 7:2:11-12, 9:1:12, 8:1:13, 11:2:3-4, 15:2:21, 6:1:18, 10:2:6). However, many interviewers felt that the term "orderly and organized" was not well defined (14:1:9, 11:2:24–3:2, 13:2:3-5, 13:2:20-23, 3:2:4-6). One interviewer acknowledged that the definition of "orderly and organized" varies, and "what I might [call] orderly and organized, someone else might not" (4:2:1-3). Another interviewer added that it might be helpful to add questions discussing the importance of clutter (1:1:21-22). Another interviewer felt that "orderly and organized" was not important because "I don't see it as any intrinsic advantage for psychiatric care" (16:3:3-8). One interviewee said this was the first time he had seen the issue of order raised (13:2:7).

Several interviewees expressed concern over the term "orderly and organized" because it did not account for the "complexity" of issues in a psychiatric facility. One interviewer called the quality of complexity "richness" (7:2:12-14). One interviewee with many years of experience as a social worker in many different psychiatric facilities said:

> The complexity and a little bit of lack of order actually makes most members . . . [more comfortable because] it allows them more autonomy and activity than something that's very prescriptive and orderly (14:1:20-25).

Another interviewee suggested that focusing too much on orderly and organized environments "tends to lead to a level of austerity that is uncomfortable and boring" (5:2:16-18). However, another interviewee said that complexity and order do not need to be mutually exclusive, commenting that the complexity that should be introduced into a psychiatric facility should not be considered "disorderly or disorganized" (11:22:12-14).

4.2.3. Well-Maintained Environment

The next set of questions addressed the importance of psychiatric facilities being well-maintained environments. Nearly every interviewee strongly supported this (10:2:8, 13:2:25, 14:2:4, 6:1:20, 15:3:1-3, 7:2:17, 4:2:17, 3:2:19). One interviewee noted that you would not get "many people to say that it was a good idea to… have dirt on the walls and scuff marks on the floors or holes in the roof" (11:3:16-20). Another interviewee suggested that it would be "important to put in a question regarding upkeep of the environment as well as cleanliness" (3:2:23–3:2). Only two interviewees suggested that this topic was not important, saying that the issue was "less obvious to patients and staff" [than to outside observers] (9:1:14-15, 16:3:11-15).

A common thread in the discussion of well-maintained environments was the idea that high-quality environments convey a sense of respect to patients (4:15:4-6, 4:14:22–15:4, 14:2:4-10). One interviewee noted, "a dirty building doesn't make anyone feel happy" (3:2:23–3:2). One social worker said,

> Specifically, it's critical in projecting an idea of respect. So if you have . . . graffiti on the walls and not working sinks, or stuff that's . . . scratched up or covered with duct tape, it . . . suggests that . . . the mission of whatever the institution is doing is not that important (14:2:4-10).

A design researcher also brought up the relationship between well-maintained environments and the incidence of violence. The interviewee noted that "if you make a high-quality environment, then people appreciate it . . . [and] are much less likely to vandalize it" (16:4:2-4).

4.2.4. Visual or Physical Access to Nature

The next set of topics addressed visual and physical access to quality landscaping. Nearly every interviewee believed that visual access to landscaping was a critical issue (6:2:14, 15:3:20-23, 3:4:7-8, 3:3:10, 7:3:23, 9:1:23–2:2, 9:2:2-4, 8:2:7, 10:2:19-20, 13:3:11, 13:3:19-20, 16:5:3-5, 14:3:6-11). Most interviewees also believed the physical access to an outdoor landscape was critical (2:2:18-20, 15:4:3, 8:2:15-17, 7:4:7, 7:1:20-24, 10:3:6, 6:3:7-9, 14:4:6). One interviewee was reminded of "the whole biophilia perspective" and the idea that nature is important in ways "we may not even completely understand" (9:1:23–2:2). Another interviewee called this "the next great frontier" (13:3:11) in the design of mental health facilities. Two interviewees felt that landscaping was intrinsically tied to aesthetics (1:2:11-14). One design researcher felt that "the garden and ground need to be exceptionally well-maintained" (16:3:20-21). One researcher affirmed the importance of physical access to nature, and warned that "just looking at beautiful plants or landscaping that you can't actually access severely limits its effects" (14:3:14-15).

Many interviewees noted that physical access to nature can be integral to the healing process. One noted, "on a recent post-occupancy evaluation, it was the only place where patients interacted with each other" (5:4:1-2).

Several interviewees suggested that the outdoor environment is considered a recuperative space, and an escape from the limitations of the indoors (14:4:17-20, 9:2:11-14, 16:6:8-15, 14:4:9-13, 14:3:22–4:2, 7:12:6-10, 5:3:17-22, 16:5:5-7). One interviewee elaborated on the function of an outdoor environment:

> By high quality, I don't just mean aesthetics . . . I also mean it needs to be very usable. I believe those gardens should have places for sports and recreation and vegetable gardens. They should attract birds and butterflies. Because those are the things that make the place joyful and those are the kinds of features that I believe make people better (16:5:16-24).

Several interviewers acknowledged that access to landscaping can be a safety issue, thus difficult to successfully provide. A couple of them acknowledged that landscaping can be dangerous (15:3:10-16, 11:4:19-22, 13:3:23-25, 9:2:14-15). One provided an example:

> In our environment, we have beautiful landscaping. But there are rocks, and there are big chairs and there were . . . poisonous plants, none of which allowed . . . our patients to go out unescorted into the environment (3:3:15-20).

Another acknowledged that windows that look out on the outdoors may be limited by behaviors like flashing (5:4:16-19).

A critical issue raised during the discussion of access to landscaping was the geographic location of facilities. Facilities in urban areas have very different expectations for quality of landscaping than facilities in suburban or rural areas (4:3:14-20, 4:3:1-3, 10:2:16-19, 11:4:14-18). One interviewee said, within the constraints of the urban environment, "it would be lovely to maximize" access to landscaping (6:2:14-17). One interviewee challenged the idea that urban settings limit access:

> If I'm in an urban environment, it may well be that I don't have much nature to have visual access to. That doesn't mean seeing the traffic go by on the street is necessarily bad" (11:5:1-5).

Several interviewees noted that it's important to define what "quality landscaping" means, precisely (3:3:22-24, 1:3:5-8, 12:1:12-14, 7:3:3-6, 8:2:1-3, 8:2:5-8, 16:5:7-12). Another interviewee felt that "it's less [about] nature; it's more just visual access... to natural light" (2:2:13-15).

One interviewee felt that physical access was much more important than visual access (10:2:23–3:2). Another interviewee felt that "visual access is better than no access, but the amount of payback you get for it is relatively small actually" (14:3:20-22). However, several suggested that the presence of high-quality landscaping is only effective if it is easily accessible (11:6:1-7, 14:3:11-12, 3:4:7-8, 5:4:8-10, 3:3:11-15). One interviewee suggested that providing a high-quality landscape "beyond a chain link fence is just some sort of psychological torture" (16:5:13-16).

Several interviewees noted that the outdoor environment should provide spaces for therapeutic activities, as well as general relaxation (1:4:8-9, 5:5:1-3, 1:3:25–4:4). One person noted that "having . . . space where people can go without [therapeutic] activity is just as critical as . . . going outside to do an activity" (14:4:20-23).

4.2.5. Damage-Resistant and Attractive Furnishings

Most interviewees believed that damage-resistant furnishings was a critical issue (10:2:10, 14:2:13, 15:3:5, 9:1:18, 5:2:21-23, 4:2:20, 3:33:5). Several interviewees felt that the terms "damage resistant" and "attractive" needed to be separated (1:2:2, 11:4:5-7). A couple of interviewees felt that these two qualities may be mutually exclusive (11:3:25–11:4:5). One researcher noted that "damage needs a lot of attention because damage and attractiveness are in conflict" (8:1:17-19). Another researcher felt "if you can find some [damage-resistant furniture] that's attractive, it's tough and it's expensive" (5:3:8-12). Another researcher raised the issue of safety, and the issue of "people being able to rip things apart and use them as weapons" (7:2:20-22).

The issue of comfortable, ergonomic furniture was raised (8:6:15-21, 9:1:18). A social worker noted the importance of unique furniture, saying that furniture can "kind of determine the mission and the vision and the kind of . . . care [the facility is] giving" (14:2:13-18).

Two interviewees, a design researcher and an architect, discussed both the advantages and disadvantages of damageable furniture. One noted "damage-resistant [furniture] leads to a challenge for people to damage something" (5:3:5-6). Another suggested that if a product was thought to be vulnerable, it encouraged vandalism. Thus, damage-resistant features may actually create opportunities for vandalism (5:3:8-12).

> *One of the reasons walls get kicked in is because the patients suspect they're hollow. They suspect something or somebody is behind them, watching them or recording them, so they attack the walls. When they notice they're hollow, bingo! They've proven themselves correct (16:4:8-14).*

4.2.6. Maximum Daylight

Most interviewees agreed that natural daylight illumination was a critical issue in psychiatric facilities (2:3:8-10, 6:3:11-14, 5:5:9-10, 14:5:2-5, 3:4:12-13, 7:1:20-21, 10:3:8, 13:4:11-12). One researcher affirmed its importance, but also said "nobody is quite sure how to do it yet in some of the more challenging buildings" (13:4:3-5). Some interviewees believe that electrical lighting is an inadequate substitution for daylight (10:13:21-25, 4:4:1-3). One director of a psychiatric facility noted that "even a well-illuminated interior space, if it's done with artificial lighting . . . doesn't present the same way" (4:3:3-8).

Many interviewees believed that daylight was especially important because it connects patients to time of day and their circadian rhythms (7:13:5-9, 14:5:11, 11:6:11-12). One researcher also noted that "a good dose of real sunlight makes people hungry at the right times" (16:8:7-12). Another healthcare consultant noted that for patients on psychiatric medication, "sleep cycles are other things can be disrupted, so I think daylight would be important" (9:2:21–3:2). The former researcher elaborated that "a good dose of daylight during the day improves restoral sleep and enforces healthy . . . sleep patterns and habits" (16:8:1-7).

A few researchers warned of the nuanced effects of natural light. One researcher suggested that levels of light should vary by illness. For example, "a well-illuminated space is not so great for an autistic child" (15:4:12-15). One researcher suggested a solution to variable light requirements—the provision of "a double switch where patients can choose for themselves . . . a warm light or a cool light, just by double clicking the switch" (16:7:19-22). Another researcher warned of the effects of changing light patterns:

> When you get different angles of sunlight and shadow at different times of the day it actually creates an environment that looks unfamiliar to people because it changes so much over the course of the day. So the attention paid to . . . stabilities . . . [is important] (8:3:3-10).

In addition, large glass windows that let in natural light raise a safety concern (17:3:1-6).
Another interviewee felt that views are more about daylight than access to nature (2:2:13-15).

4.2.7. Staff Safety/Security

Several interviewees believed that staff safety is of the utmost priority (17:3:16-19, 12:2:6-10, 7:12:21, 12:2:18-19, 3:4:19-21, 5:5:15-16). Two interviewees said that staff safety could be improved and should be explored. (3:4:19-21 and 2:3:16-19). Others stated that safety is of utmost importance (7:12:21, 12:2:18-19, and 5:5:15-16).

Interviewees suggested safety measures to prevent incidents of violence in private spaces. One designer described the benefits of a small outdoor meeting space:

> What sometimes happens . . . is that the staff member gets beaten up because they're going into a small private place . . . So I think privacy but with easy visualization of that activity by others . . . The small garden I just mentioned is a good example of that, because it's on the other side of a glass wall and you can see what's happening over there easily" (5:12:13-19).

Other recommendations include a one-way glass window in the meeting space or a room with acoustic monitoring (1:13:24–14:2, 7:9:1-6).

A significant portion of the discussion overlapped with the topic of nurse stations. A designer noted that closed stations are a safety issue (15:9:2-7). Another interviewee suggested that an "escape route" be provided for staff "in case somebody is coming over the counter" (12:2:12-16). Another interviewee said that "mostly it boils down to whether a patient jumped over the counter and assaulted an admin recently or not. . . . .And that does happen" (12:2:6-10).

4.2.8. Private or Shared Bedrooms and Baths

Many interviewees believed that bedroom and bathroom occupancy was a very interesting area for further research (17:4:10-14, 14:6:13-14, 5:6:10-12, 10:5:7-11, 3:6:11-12, 7:5:21–6:2, 11:9:10, 14:6:13-15, 10:5:19, 13:6:14, 3:7:22, 9:6:6).

Many interviewees believed that private patient bedrooms were better for patients, because it provides patients with a private and normalized experience (11:9:10-13, 3:6:19-20, 9:5:7-11, 4:6:5-9). One housing director noted that it is important to provide "a place that someone can go to, where they can shut the door" (6:4:22–5:2). A researcher noted that when the importance of single rooms is challenged, "it's often from the financial expectations" (16:10:23–11:2). In contrast, one designer noted that "if every room is a single room, it really attenuates the size of a unit and makes it harder to supervise" (5:6:14-17). Many interviewees also believed that private bathrooms were much preferred to shared bathrooms, particularly because they mimic the private bathroom experience of most homes (16:12:19-22, 7:6:22, 8:5:11-13, 15:7:3, 11:10:1-3, 17:4:17-21, 12:7:16-17).

Several other interviewees acknowledged the importance of shared bedrooms in the recovery process. Shared bedrooms are important for socialization (12:5:21-25, 14:7:19-24, 3:6:13-18, 15:6:12-15). Another interviewee said that shared bedrooms allow facilities to extend patient vigilance to roommates:

> *We had multiple situations where roommates would alert staff if the patient was doing something they shouldn't be doing . . . including committing suicide. A lot of interventions were able to be made because roommates were able to tip staff off to things" (12:5:8-13).*

Similarly, private bathrooms raised safety concerns because "actual patient harm [is] usually done in private spaces (13:6:15-16, 15:7:4-6). Private bathrooms are also a financial burden, because they require lots of anti-ligature and patient-proof detailing (6:6:4-7, 5:9:11-16, 16:12:22–13:2, 5:9:1-3). Several interviewees considered private bathrooms impractical because their use nearly always requires staff supervision, which is difficult to provide (9:6:7-10, 15:7:9-13). However, another interviewee noted that, often, shared bathrooms also require staff supervision and one-at-a-time usage, "so basically what you've done is you just reduced the bathroom count" (12:7:10-14). Several interviewees suggested that private bathrooms be shared between several patients, like in a family home (4:6:12-20, 6:6:7-11).

Several researchers believe that bedroom type should depend on the acuity of a patient's illness (8:5:1-3, 9:5:1-4, 12:5:13-16). One designer noted that for patients with dementia who are awake at irregular hours, "private rooms keep them from bothering other patients" (15:6:6-12). Another designer said, "We need to look at what the patient profiles are expected to be undergoing and then make the decision" about how to house them (11:9:14-20). Another researcher also noted that patient cultural norms must be respected (16:11:7-10).

4.2.9. Patient Staff Interaction/Observation

The next set of questions addressed the issue of patient-staff interaction and observation. Nearly all interviewees stated that private areas for staff-patient interaction are essential to the function of the psychiatric facility (10:8:6, 13:7:21-22, 16:14:18, 14:10:3-4, 12:9:1, 11:13:24, 9:8:5, 8:7:8-9, 2:6:19-22). One interviewer commented, "a lot of patients feel comfortable when their turn is coming up, that they're going to be able to sit and talk to the counselor" (15:8:8-10). Two interviewees commented that this is an area for further research (3:9:13, 16:14:23–15:2).

Several interviewees suggested that, rather than having areas specifically designated as private interaction rooms, interactions take place in multi-function rooms (16:14:21-23, 4:10:1-5, 6:7:20–8:2). One designer also recommended the use of private outdoor spaces, such as gardens, for one-on-one interaction, as "some of the people that come into mental health [facilities] are much more comfortable outdoors" (5:5:1-8).

4.2.10. Social Interaction

The next topic was dayrooms and social support. Nearly all interviewees believed that this topic is a very important one to discuss (15:7:17,12:8:16-18, 7:7:11, 13:7:10, 9:6:19, 17:5:17-22, 3:8:3, 10:6:23, 5:9:24–10:2). Some interviewees felt that the term "dayroom" needs to be more fully defined (11:11:24-25). One interviewee noted that "calling it a 'dayroom' is by itself a negative" (4:7:24-25). Another interviewee said that current dayrooms show a lack of imagination (14:9:6-11).

A recurring concern was the ability of dayrooms to facilitate social activities. Many felt that dayrooms should provide a flexible space for a range of social activities (11:11:25–12:3, 5:10:14-16, 17:5:18-21, 4:8:2-4, 8:6:7-11, 6:6:17-21). Interviewees commented that social involvement is particularly important in the recovery process (5:7:9-13, 7:13:2-5). One interviewee noted:

> *I think the whole point of mental health care is the idea that people feel isolated and alone, or overwhelmed by their own problems. It's important for them to feel connected to staff and other patients or staff and their family members. . . . (7:4:19-24).*

Another interviewee suggested that connections with people, not just within the facility, but also outside of it, were important for recovery (7:13:2-5).

4.2.11. Autonomy and Spontaneity

The next topic addressed was autonomy and spontaneity. Many interviewees recognized the importance of spaces conducive to autonomous and spontaneous behavior (16:14:5-8, 14:9:23-24, 4:9:4, 6:7:12-13, 12:8:23, 6:7:14-17, 9:7:5-7). One designer pointed out that, without such spaces, "the therapy itself . . . doesn't move as fast as it should" (11:13:18-21). Several interviewees expressed confusion over the meaning of "autonomy and spontaneity" (6:7:13-14, 10:7:6-7, 8:6:24, 1:7:8-9, 9:7:16-17). One healthcare consultant added, "I'm not sure how you design to get that" (9:7:4-7). Three other interviewees suggested that this was a good area for further research (13:7:17-18, 4:8:15-16, 3:9:3-4).

Interviewees offered suggestions on the ways in which autonomy and spontaneity could be facilitated. Two interviewees discussed the importance of kitchens in providing autonomy (4:9:4-9, 16:16:7-13). One researcher noted:

> The idea is that the fridges in those ADL [Activities of Daily Living] kitchens should have fresh fruits and vegetables, and there should be . . . fully complemented ingredients . . . so that people can actually cook for themselves because that's part of the recovery (16:16:19-23).

Interviewees elaborated on the importance of control and choice (1:8:1-3, 10:7:22–8:3). Autonomy was also associated with empowerment, trust, and respect (7:13:14-17, 7:7:21-24, 9:7:21–8:2). One interviewer suggested that autonomy be treated and provided as a privilege to reward good behaviors. These rewards "may be access to television or access to a computer . . . [or] a video game" (9:7:17-21).

Many interviewees also brought up concerns about safety that accompany autonomy (14:13:1-7, 11:13:11-13, 11:13:13-16, 5:11:21-24, 5:11:15-18). One designer noted the difficulty of finding "an environment that can [provide autonomy] yet at the same time meet all environment of care standards" on a unit (3:9:5-7). Three interviewees did not believe autonomy was a critical issue (8:7:3-5, 15:8:4-5, 17:6:12-14).

4.2.12. Suicide Resistant Furniture, Furnishings, and Equipment

Nearly all researchers felt that suicide-resistant and anti-ligature equipment was a critical and evolving issue, and one that requires additional research and dialogue (16:18:21–19:2, 12:11:23–12:5, 5:14:13, 3:11:1-4, 10:10:19-24, 10:10:15-17, 8:10:5, 9:9:12-17, 7:11:11-13, 11:16:4-7, 13:12:9-13, 12:11:10, 11:16:13-15). One VA administrator said "everybody acknowledges . . . [that] a suicide assessment tool [is] unreliable at best" (13:11:7-9). Another designer noticed progress in anti-ligature design, commenting, "they're becoming a lot less institutional looking so . . . I think it's important" (15:10:7-10). Two others noted that such features are essential in inpatient facilities, due to issues of liability (12:12:16-18, 5:14:15-19). Interviewees noted the importance of anti-ligature design in private spaces, particularly bathrooms, where most suicide attempts occur (12:12:10-13, 12:12:18-21, 13:12:15-18). Two interviewees felt guidelines had already been

established (9:9:12, 7:11:15-18).

Two interviewees stressed that suicide-resistant features must be imperceptible to patients (16:18:6-11, 14:11:23-24). One researcher noted, "if you can't hang a coat because of the anti-ligature [design]... that fitting actually reminds the patient of suicide at all times" (16:18:16-18). One interviewee recommended the use of alarms at the top of doors and ligatures to notify staff of suicide attempts (11:16:7-11). One interviewee, a facility administrator, rejected the idea of suicide-resistant features (4:13:1-2):

> *A lot of that [anti-ligature design] we would find actually probably quite demeaning . . . We don't keep sharp knives hidden from people with mental illness because that's saying that you're not capable of . . . operating like everyone else, so that [precaution] would be really harmful (4:13:2-8).*

Another interviewee, a housing director, said suicide attempts were unlikely to be prevented by design, and should instead be prevented by clinical support and meaningful relationships within the community (6:9:16-21).

4.2.13. Mix of Seating

Nearly all interviewees felt that a mix of seating arrangements was a critical issue in facility design (13:7:13-14, 12:8:20, 10:7:1-2, 7:7:13-14, 4:8:13, 3:8:14-21, 8:6:15). One researcher went further and said, "Flexible seating arrangements are essential. People should be able to rearrange their environments" (16:13:20-21). Another interviewee added that the furniture must "be moveable and not firm" (9:6:21).

Many interviewees elaborated on the types of seating that should be provided (15:7:21–8:2, 11:12:22–13:4, 6:7:4-7, 11:12:4-9, 14:8:23). One social worker noted:

> *It's not how we would want to live... And it's [these] peoples' homes. So maybe you have lamps here and you [have] overhead lighting here, you have this kind of table there, a smaller table [there]. Maybe you even have a half wall somewhere, you know. Maybe I don't want to have to see everybody (14:9:11-17).*

Another interviewee pointed out that a variety of seating arrangements provides spaces for one-on-one interactions or group therapy (7:13:20-24).

4.2.14. Smoking Rooms

The provision of smoking rooms was a contentious issue. There appeared to be no consensus on appropriate design. A few interviewees acknowledged that it was an important topic to discuss (4:12:16-19, 3:10:3-7, 14:10:22). Several interviewees believed that, for the time being, smoking rooms are necessary in psychiatric facilities (13:9:25, 15:10:1-3, 16:17:10-12). Several other interviewees advocated for outdoor smoking areas, given the health hazards and restrictions

surrounding indoor smoking (14:11:11-2, 14:11:14-16, 6:9:1-3, 6:9:5-8, 4:12:13-14). One designer noted, "if you're on a hospital campus . . . then by virtue of that, you can't smoke" (3:10:19-21). Many interviewees commented that smoking rooms were no longer present in psychiatric facilities (3:10:14-17, 12:10:17-19, 9:9:6-7, 17:8:7, 12:10:3-4, 12:10:4-11, 8:9:4-7). One designer stipulated, "if you're going to be here, you don't smoke" (11:15:16-17).

Several interviewees discussed the benefits of smoking alternatives. Two supported electronic "e-cigarettes" as a viable alternative to tobacco cigarettes (16:17:16-19, 10:9:11-14). Four interviewees recommended prohibiting smoking, but providing nicotine patches to patients (11:15:20, 3:10:13-14, 12:11:1-2). One designer noted:

> I think the VA in Palo Alto did a really smart thing. They gave everybody nicotine patches if they were smokers and said "absolutely no smoking," and what happened . . . was that they eliminated a huge number of arguments, because some people would have their pack of cigarettes . . . and get into fights. And now they just don't have that particular irritation (5:14:1-9).

Several interviewees noted that access to a smoking room should depend on a patient's treatment plan (13:10:13-16, 9:8:23-24). One interviewee noted, "the trickiest thing to do to someone who is struggling is ask them to change too many things simultaneously" (10:9:15-18). Another interviewee in favor of smoking rooms mentioned that although facilities may want "patients to be healthy . . . you shouldn't force them to be healthy" (7:11:1-3).

4.2.15. Nurse Station

There was no consensus on appropriate design for this very important feature of any psychiatric facility. Many interviewees think that this is a prime area for further research (14:10:7-8, 4:11:9, 8:8:15, 8:7:15, 11:14:13, 7:9:12-14, 15:8:17-23, 14:10:11-12, 3:9:15-21). One designer noted that "it's a philosophical question in terms of how do you do it" (11:7:4-7). Another interviewee reflected on a facility that had opened up its nurses' stations and "were delighted with it, so I'm hoping that's a trend. . . . The plans I'm working with seem to be moving in that direction" (12:3:6-13). Patient visibility was a chief concern for many interviewees (11:10:11-16, 12:9:9-14, 5:10:22–11:1). One interviewee noted that "if you can't see places, there are opportunities for unsafe things to happen" (5:5:19-21).

Many interviewees recognize that the continuum of nurse station design runs between staff safety and patients' quality of care (7:9:15-22). One designer noted, "We always argue for open nurse stations, and we nearly always lose that battle" due to safety concerns (5:12:22-23). Another researcher acknowledged that centralized stations make the environment "worse" but they are "put there primarily to protect the staff" (16:9:11-14). One Veterans Affairs administrator noted, "The conventional wisdom is that the more open they are the better, therapeutically; but there is a staff issue that tends to divert us from that thinking" (13:8:1-3). One interviewee acknowledged that it's possible to provide

"a feeling of open access while still providing safety and security" (13:8:3-5).

Interviewees offered contrasting opinions about centralizing nurse stations. One researcher said, "Staff stations are the most dangerous aspect of a facility" and create myriad opportunities for violence (16:15:10-14). Another felt that "there's nothing we can do other than putting them behind glass" (15:5:2-4). Several interviewees felt that open or semi-open designs were the most appropriate (12:9:9-14, 7:10:13-15, 11:10:11-16, 5:10:22–11:1, 10:8:17-20).

Several interviewees warned of the implications of closed nurse stations on the staff-patient relationship. Several agreed that closed nurse stations worsened relationships between staff and patients, and made patients feel as though they were being spied on (12:9:7-9, 10:8:14-17, 11:6:24–7:2, 4:12:9-11, 9:8:8-12). One researcher recalled a psychiatric facility with a closed nurse station:

> *I've seen . . . nursing stations . . . where new facilities were built with . . . enclosed glass and . . . the patients actually broke the windows with chairs, and then they never rebuilt the glass enclosure and [the staff and patients] actually had, I think, a better working relationship after that (8:7:15-22).*

Another interviewee argued against closed stations because, as a rule of thumb, "there shouldn't be any places where people can shut themselves in" (4:11:17-19).

4.2.16. Indoor/Outdoor Therapy

The next set of questions addressed indoor and outdoor recreational spaces that facilitate therapeutic activities. Many interviewees affirmed the importance of these spaces in psychiatric hospital layouts (15:9:16, 13:9:18, 14:10:18, 9:8:21, 8:8:18-19, 3:10:1, 12:9:20). One healthcare administrator commented, "When you're relaxed physically, it helps you in other ways" (7:10:18-21). One interviewee wanted a specific definition of therapeutic activities (12:9:22-23). Two interviewees suggested putting in questions concerning positive distractions (1:10:12-14, 1:11:6-9, 5:11:24–12:5). One researcher asked, "Do they have a healthy lifestyle? Do they have the input?" (1:11:24–12:2). A designer acknowledged the need for further research on the topic, particularly in the area of therapeutic quiet time and private spaces (17:7:17-20, 17:8:23–9:2).

Two designers elaborated on the importance of quiet therapeutic spaces (15:9:16-22, 17:7:22–8:3). One designer described a designated quiet, therapeutic space:

> *They introduced . . . a therapy swing room, where a sling swing is hung form the ceiling. And the idea is, [if] the patient is agitated or needed timeout, he or she can go into that room and sit in the swing, and the way it's described to me is like being back in the womb. It's a calming experience" (17:7:7-14).*

Two other designers pointed out that therapeutic activities can take place in flexible spaces (17:9:3-5). One researcher recalled a facility for adolescents

"where the corridors were wide enough that they could put in a ping-pong table" (8:8:21–9:2).

One designer warned of the destructive effects of a lack of physical activity (5:10:10-11, 5:15:15-16). The designer added that "people complain a lot about not being able to sleep" due to a lack of physical exertion during the day (5:15:18-23). Several designers offered examples of activities that could be offered. One recommended the use of a stationary bicycle or computer games, such as the Nintendo Wii (5:13:12-16, 5:10:2-6). Another interviewee discussed the integration of patients into the actual administration of the facility—a so-called "working community" (4:17:21-25). This interviewee described an actual facility:

> We have a unit that serves food. So people prepare and serve food and clean up. We have one that deals with mailing a newsletter, so people have a chance to write and edit and use staff message. We have one that focuses on research and evaluation. And we have an area in a unit that's about horticulture and maintenance (4:17:25– 18:6).

4.2.17. Staff Respite

The next set of questions addressed whether to include spaces for staff respite, relief, and counseling. Many interviewees believed this was a critical question and an area for further research (11:8:18-23, 11:6:20-23, 10:4:13-14, 10:3:23-24, 9:4:15-17, 15:5:1-2, 9:4:8-10, 15:5:20–6:1, 13:5:2, 13:5:7, 17:3:25–4:4, 16:8:10-20 and 9:2). A few patients were confused about the interpretation of the term "staff respite" (1:5:7-12, 3:5:9-12, 3:5:14-19, 12:3:22-23). One architect suggested adding to the instrument "a series of well-being kinds of questions [including] . . . staff access to physical activity spaces . . . and spaces for taking a mental break" (1:5:19-24). Many interviewees affirmed the need for a space to which staff can withdraw (5:6:1-4, 12:4:1-4, 9:3:19-22, 9:3:3-15, 8:4:10-11, 10:4:16-19, 10:4:21-22, 11:8:10-11, 11:8:16-18, 7:5:12-13, 16:10:13-17). One researcher elaborated on the importance of staff respite spaces:

> The essential idea is on-stage spaces and off-stage spaces. When a staff member is on-stage . . . they're doing their thing delivering therapy, delivering care. When they're off-stage, they're behind a wall, not behind a screen. They might be doing their notes, sitting on Facebook, or having a cup of tea. They might be recuperating, they might be grief counseling. These things take place outside the gaze of the patients. So [staff members] shouldn't be obligated to multitask (16:10:3-13).

Some interviewees felt that staff respite spaces were only important in inpatient settings (6:4:7-11, 9:4:17-19, 10:4:2-6). Other interviewees felt multipurpose rooms could be used for staff respite (15:5:6-9, 12:4:6-14, 3:11:23-24). Often, due to space limitations, it is not possible to provide staff-only spaces on units (3:11:17-22, 15:5:22-24). Two interviewees questioned whether staff would want

to receive counseling in the facility in which they work (12:3:23–4:1, 12:4:14-17, 3:5:24–6:2). Several interviewees felt these spaces were not critical at all (4:5:6-9, 3:5:19-24, 6:4:1-5). Three interviewees felt staff support and safety could be provided through other means (10:8:20-25, 11:7:7-13). One social worker acknowledged that, while staff safety is important, it's not "an architectural engineering kind of thing. It's much more of a training kind of issue" (14:5:17-19).

The topics that were generated from the literature review discussed above also resulted in additional questions for the survey. These are addressed in the following section on the Focus Group, in which group participants also made recommendations and modifications.

4.3.   Focus Group

Members of the focus group also tested the survey instrument. The time required to complete the survey was 15 to 20 minutes. The focus group also served to test the effectiveness of the Qualtrics website and sequencing of the questions.

As a result of the focus groups and interviews, eight additional topics were identified and incorporated into the survey:

- Attractive/aesthetic space
- Attractive/comfortable furniture
- Good electric lighting
- Noise control
- Impact of staff experience
- Positive distraction
- Impact of length of stay
- Impact of unit size

One of the most well-known studies on unit size is Wilson, Soth and Robak's (1992) study on adolescent residential units. Researchers examined the impact of transitioning from a 40-bed unit to four 10-bed units and found a reduction in vandalism, acting out, and theft. Patients tended to identify more effectively with their (smaller) unit, which engendered a feeling of security and belonging, efficacy, and involvement. Staff expressed greater satisfaction, too. The disadvantages included patient restlessness, due to the more confined space, and reluctance to engage with the broader hospital milieu.

4.4.   Survey

The results of the survey analysis are summarized in a description of the demographics of the respondents and the facilities they represent. Following this summary, the results are divided into two parts: one addresses all three types of facilities (inpatient, emergency room, and outpatient) and the second addresses questions that were focused on inpatient facilities alone.

4.4.1. Subject Demographics

The job titles of the respondents were reported as such, in order of most frequent to least: psychiatric nurse (*n=62*), other job title (*n=19*) (other job titles indicated include manager and psychiatric nurse practitioner), psychiatric nurse practitioner (*n=10*), educator (*n=7*), social worker (*n=5*), psychiatric social worker (*n=1*), and psychiatric technician (*n=1*).

Of the participants who reported their length of time in the field, the majority indicated that they have worked in the field for more than 20 years (*n=54*), followed by 1 to 5 years (*n=17*), 6 to10 years (*n=12*), 16 to 20 years (*n=11*), 11 to 15 years (*n=6*), and <1 year (*n=2*). Of the participants who reported their gender, the majority was female (M=87) and a minority was male (18).

4.4.2 Facility Descriptions

The majority of the facilities described were inpatient facilities (*n=73*), followed by outpatient facilities (*n=33*), other facilities (*n=29*), and emergency rooms (*n=8*). Most of the facilities were located in the United States (*n=64*), followed by Australia (*n=31*), Canada (*n=7*), and the United Kingdom (*n=2*). The majority of these facilities were urban (*n=52*), followed by suburban (*n=35*), and rural (*n=15*). Fifty-three respondents indicated that their facilities were physically attached to or adjacent to a general hospital, whereas 48 respondents indicated that their facilities were not physically attached or adjacent to a general hospital. The majority of respondents would describe their facility as a public institution (*n=57*), followed by not-for-profit institution (*n=45*), private institution (*n=20*), research institution (*n=17*), post-graduate education institution (*n=11*), and other type of institution (*n=5*).

The most commonly reported disorders treated in these facilities were schizophrenic/psychotic disorders (*n=100*), followed by mood disorders (*n=97*), anxiety disorders (*n=93*), post-traumatic stress disorder (*n=82*), obsessive-compulsive disorder (*n=71*), impulse disorder and addiction (*n=70*), cognitively challenges (*n=59*), autism spectrum disorder (*n=42*), eating disorders (*n=41*), and other disorders (*n=21*). The majority of respondents indicated that the predominant patient population of their facility was adult (*n=89*), followed by pediatric (*n=12*), and adult geriatric (*n=3*).

Of the respondents working in facilities with ER psychiatric holding rooms, most indicated that their facilities had only one ER psychiatric holding room (*n=3*), followed by 5 to 10 (*n=2*), 16 to 20 (*n=1*), and more than 20 (*n=1*). Of the respondents working in facilities with patient counseling rooms, most indicated that their facilities had five or fewer patient counseling rooms (*n=13*), followed by 11 to 15 (*n=7*), more than 20 (*n=5*), 6-10 (*n=4*), and 16 to 20 (*n=2*).

Of the inpatient facilities described, most have an average length of stay of 4 to 7 days (*n=26*), followed by 8 to 13 days (*n=17*), 2 to 4 weeks (*n=8*), more than 4 months (*n=5*), 1 to 4 months (*n=3*), and less than 4 days (*n=3*). In terms of patient beds in inpatient facilities, most were reported to have 11 to 50 beds (*n=28*),

followed by 5 to 100 (*n=10*), more than 200 (*n=8*), 151 to 200 (*n=7*), 10 to 150 (*n=5*), and less than 11 beds (*n=3*). The number of beds in a typical unit in these facilities was either 15 to 20 (*n=21*) or 21 to 25 (*n=21*), both receiving the same number of votes. After this came 11 to 15 (*n=6*) and 26 to 30 (*n=6*), more than 30 (*n=5*), and less than 11 beds (*n=3*).

4.4.3 All Respondents

According to a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction, the only significant difference between the importance scores of the following categories is between the top-ranked category (well-maintained environment) and the lowest-ranked category (orderly and organized environment) (*p<.05*). However, it is worth noting that the lowest-ranked category is still ranked quite high (5.8 on a 7-point Likert scale).

And according to a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction, the only significant difference between the effectiveness scores of the following categories is between the top-ranked category (well-maintained environment) and the lowest- and second-lowest-ranked categories (visual/physical access to the outdoors and deinstitutionalized environment, respectively) (*p<.05*).

4.4.3.1. Deinstitutionalized and Homelike Environment

Of the following categories—deinstitutionalized environments, orderly and organized environments, attractive and aesthetic environments, well-maintained environments, and visual and physical access to the outdoors—deinstitutionalized environments were considered to be second-to-least important. Of these categories, it was also rated as the one that the respondents' current facilities were second-to-least effective in providing. Figure 4.1 graphically summarizes the relationships.

The mean score of the importance of a deinstitutionalized environment in a mental or behavioral health facility was 5.88 (*SD=1.025*). The mean score of the effectiveness of the respondents' current facilities in providing a deinstitutionalized environment was 4.29 (*SD=1.77*). After performing a Mann-Whitney U test, the importance scores of deinstitutionalized environments were found to be significantly higher than the effectiveness scores of deinstitutionalized environments (*p<.001*).

The characteristics that contribute to a deinstitutionalized environment were ranked in order of importance from most to least, with lower means indicating a ranking closer to 1 or "most important": spaces that convey a sense of respect towards patients (*M=2.85, SD=1.633*), physical environments that allow for choice and control (*M=3.33, SD=1.675*), a welcoming entry experience (*M=3.41, SD=2.236*), spaces that support privacy (*M=3.97, SD=2.045*), spaces that are comfortable and cozy (*M=4.49, SD=1.578*), furniture and finishes similar to an apartment or house (*M= 5.00, SD=2.374*), artwork and décor (*M=6.36, SD=1.502*), furniture and furnishings similar to a hotel or spa (*M=7.18, SD=1.545*), and other

characteristics (M=8.40, SD=1.863).

A Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction revealed, however, that there were not significant differences between the four top characteristics that contribute to a deinstitutionalized environment: spaces that convey a sense of respect toward patients, physical environments that allow for choice and control, a welcoming entry experience, and spaces that support privacy. The only significantly different stepwise comparisons are between the sixth- and seventh-ranked characteristics contributing to a deinstitutionalized environment, furniture and furnishings similar to an apartment or house and artwork and décor respectively (p<.05), and the eighth- and ninth-ranked, furniture and furnishings similar to a hotel or spa and 'other' respectively (p<.05).

However, there are several significant differences between non-stepwise rankings, such as the first-ranked (spaces that convey a sense of respect toward patients) and fifth-ranked (spaces that are comfortable and cozy) (p<.001); between the second-ranked (physical environments that allow for choice and control) and sixth-ranked (furniture and furnishings similar to an apartment or house) (p<.001); between the third-ranked (a welcoming entry experience) and sixth-ranked (furniture and furnishings similar to an apartment or house) (p<.05); and, finally, between the fourth-ranked (spaces that support privacy) and seventh-ranked (artwork and decor) (p<.001). For full results of the Kruskal-Wallis one-way ANOVA and the multiple comparison post-hoc, see the Appendix.
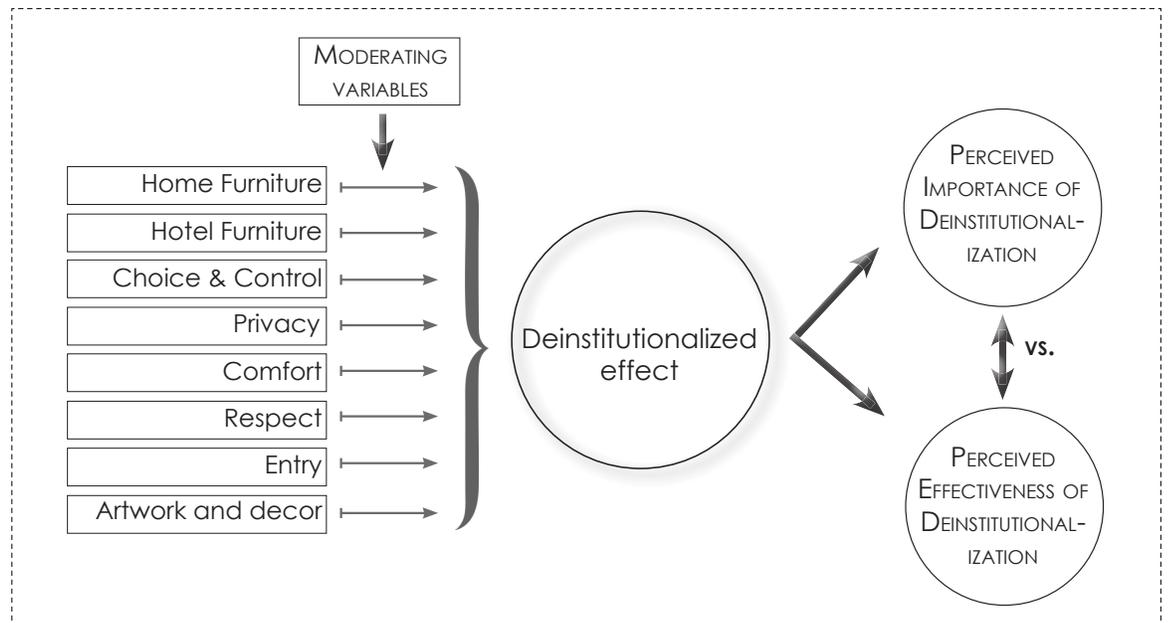

Figure 4.1. Summarizing the relationships for deinstitutionalized and homelike environment

4.4.3.2. Orderly and Organized Environment

Of the following categories—deinstitutionalized environments, orderly and organized environments, attractive and aesthetic environments, well-maintained environments, and visual and physical access to the outdoors—orderly and organized environments were considered to be least important. It should be noted that despite being rated the least important, the mean importance score was still quite high (5.8 on a 7-point Likert scale). Of these categories, it was also rated the category that respondents' current facilities were second-most-effective in providing. Figure 4.2 graphically summarizes the relationships.

The mean score of the importance of an orderly and organized environment in a mental or behavioral health facility was 5.8 (SD=.957). The mean score of the effectiveness of the respondents' current facilities in providing an orderly and organized environment was 4.71 (SD=1.419). After performing a Mann-Whitney U test, importance scores for an orderly and organized environment were found to be significantly higher than effectiveness scores (p<.001).

The characteristics contributing to an orderly and organized environment were ranked in order of importance from most to least, with lower means indicating a ranking closer to one or "most important": absence of clutter (M=1.80, SD=.939), navigable and readable space arrangement (M=2.41, SD=1.16), all equipment having a designated storage area (M=2.81, SD=.962), visually cohesive or matching furniture and furnishings (M=3.19, SD=1.11), and other characteristics (M=4.80, SD=.758).

A Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction showed the only significant stepwise comparison of these characteristics is between the fourth-ranked characteristic (visually cohesive or matching furniture and furnishings) and the fifth-ranked ("other") (p<.001). However, there are several significant differences between non-stepwise rankings, such as between the first-ranked characteristic (absence of clutter) and the third-ranked (all equipment has designated storage area) (p<.001) and between the second-ranked (navigable and readable space arrangement) and the fourth-ranked (visually cohesive or matching furniture and finishes) (p<.05). For full results of the Kruskal-Wallis one-way ANOVA and the multiple comparison post-hoc, see the Appendix.
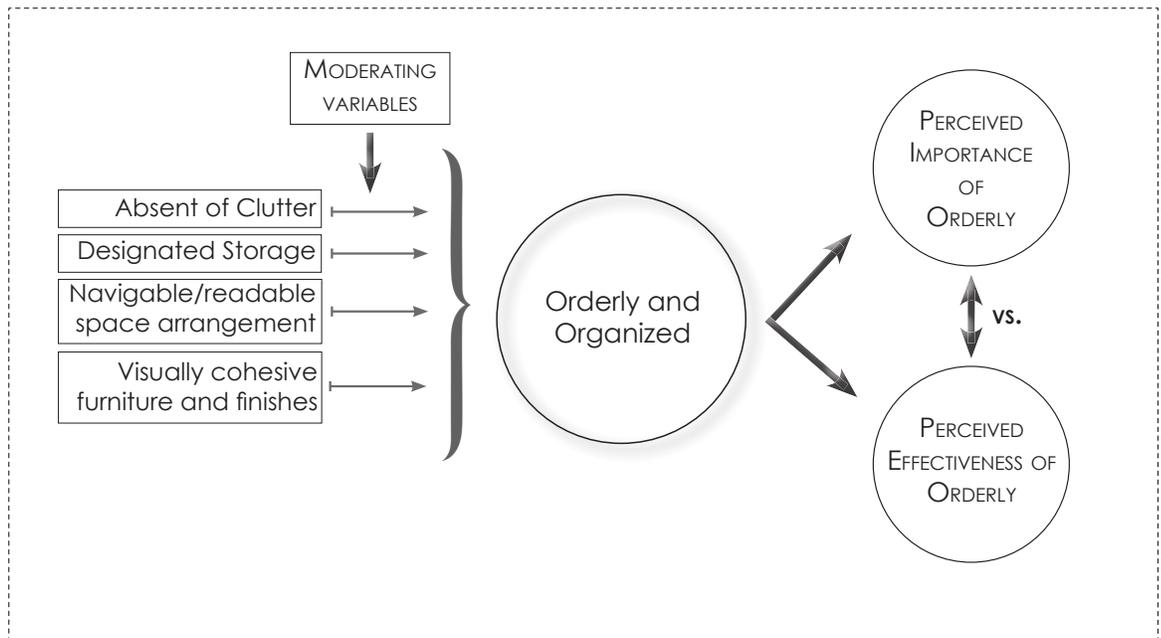
Figure 4.2. Summarizing the relationships for orderly and organized environment

4.4.3.3. Well-Maintained Environment

Of the following categories—deinstitutionalized environments, orderly and organized environments, attractive and aesthetic environments, well-maintained environments, and visual and physical access to the outdoors—well-maintained environments were considered to be of the highest importance. Of these categories, it also was rated the category that the respondents' current facilities were most effective in providing. Figure 4.3 graphically summarizes the relationships.

The mean score of the importance of a well-maintained environment in a mental/behavioral health facility was 6.26 (SD=.69). The mean score of the effectiveness of the respondents' current facilities in providing a well-maintained environment was 4.98 (SD=1.459). After performing a Mann-Whitney U test, importance scores for well-maintained environments were found to be significantly higher than effectiveness scores (p<.001).

The characteristics of a well-maintained environment were ranked in order of importance from most to least, with lower means indicating a ranking closer to one or "most important"): clean floors, walls, and other surfaces (M=2.01, SD=.97), properly operating electrical fixtures and heating and cooling systems (M=2.32, SD=1.085), furniture and furnishings in good condition (M=2.76, SD=1.173), properly operating equipment (M=2.96, SD=1.043), and other characteristics (M=4.94, SD=.485).

A Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction revealed the only significant stepwise comparison

of these characteristics is between the fourth-ranked characteristic (properly operating equipment) and the fifth-ranked characteristic ('other') (p<.001). However, there are several significant differences between non-stepwise rankings, such as between the first-ranked characteristic (clean floors, walls, and other surfaces) and the third-ranked (furniture and furnishings in good condition) (p<.05); the second-ranked (properly operating electrical fixtures and heating and cooling systems) and the fifth-ranked ('other') (p<.001); and the third-ranked (furniture and finishes in good condition) and the fifth-ranked ('other') (p<.001). For full results of the Kruskal-Wallis one-way ANOVA and the multiple comparison post-hoc, see the Appendix.
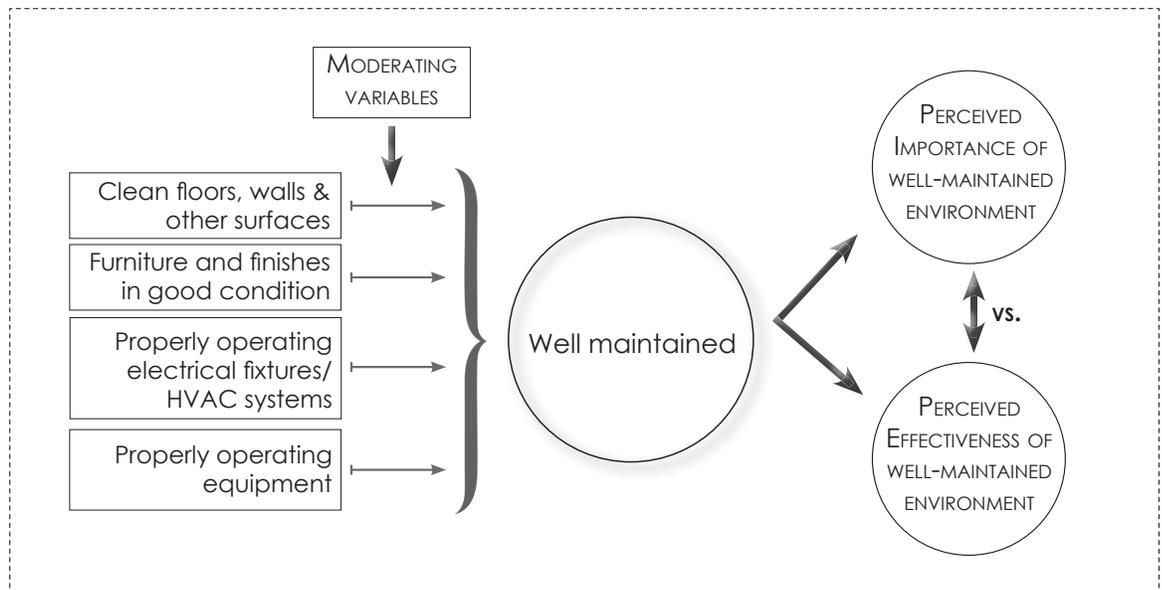

Figure 4.3. Summarizing the relationships for well-maintained environment

4.4.3.4. Visual and Physical Access to the Outdoors

Of the following categories—deinstitutionalized environments, orderly and organized environments, attractive and aesthetic environments, well-maintained environments, and environments with visual and physical access to the outdoors—visual and physical access to the outdoors was considered to be the second-most-important. Of these categories, it also was rated as the one that was least effectively provide in respondents' current facilities. Figure 4.4 graphically summarizes the relationships.

The mean score of the importance of visual and physical access to the outdoors in a mental or behavioral health facility was 6.01 (SD=.796). The mean score of the effectiveness of the respondents' current facilities in providing it was 4.22 (SD=1.766). After performing a Mann-Whitney U test, importance scores for physical and visual access to the outdoors were found to be significantly higher than effectiveness scores (p<.001).

The characteristics contributing to visual access to the outdoors were ranked in

order of importance from most to least, with lower means indicating a ranking closer to 1 or "most important": visual access to views of pleasant/interesting gardens (M=1.65, SD=.688), visual access to views of pleasant/interesting natural landscapes (M=1.67, SD=.718), visual access to views of pleasant/interesting street life (M=2.76, SD=.617), and other characteristics (M=3.92, SD=.419).

A Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction revealed that there are significant differences in the stepwise comparisons of the second-ranked characteristic (visual access to views of pleasant or interesting natural landscapes) and the third-ranked characteristic (visual access to views of pleasant or interesting street life)(p<.001), as well as the third-ranked (visual access to views of pleasant or interesting street life) and the fourth-ranked ('other') (p<.001). There is no significant difference between the first-ranked characteristic (visual access to views of pleasant or interesting gardens) and the second-ranked characteristic (visual access to views of pleasant or interesting natural landscapes), but there is a significant difference between the first-ranked characteristic (visual access to views of pleasant or interesting gardens) and the third-ranked characteristic (visual access to views of pleasant or interesting street life) (p<.001). For full results of the Kruskal-Wallis one-way ANOVA and the multiple comparison post-hoc, see the Appendix.

The characteristics that contribute to physical access to the outdoors were ranked in order of importance from most to least, with lower means indicating a ranking closer to 1 or "most important"): physical access to outdoor spaces that support patient safety and security (M=1.77, SD=1.279), physical access to spaces for one-on-one conversations (M=3.44, SD=1.45), physical access to pleasant/interesting gardens (M=3.61, SD=1.585), physical access to spaces that support group activities (M=3.78, SD=1.722), physical access to pleasant/interesting natural landscapes (M=4.07, SD=1.577), physical access to spaces for sitting alone (M=4.50, SD=1.381), and other characteristics (M=6.83, SD=.90).

A Kruskal-Wallis one-way ANOVA with pair-wise multiple comparisons and a Dunn-Bonferroni correction revealed the only significant stepwise comparisons of these characteristics is between the first-ranked characteristic (physical access to outdoor spaces that support patient safety and security) and the second-ranked characteristic (physical access to spaces for on-on-one conversations) (p<.001) and between the sixth-ranked (physical access to spaces for sitting alone) and seventh-ranked characteristics ('other') (p<.001). It should be noted that the first-ranked characteristic—physical access to outdoor spaces that support patient safety and security—is ranked significantly higher than all other characteristics that contribute to quality landscaping and physical access to the outdoors. There are several significant differences between non-stepwise rankings, such as between the second-ranked characteristic (physical access to spaces for one-on-one conversations) and the sixth-ranked characteristic (physical access to spaces for sitting alone) (p<.05) as well as between the top six ranked characteristics and the seventh-ranked characteristic ('other') (all p<.001). For full results of the Kruskal-Wallis one-way ANOVA and the multiple comparison post-hoc, see the Appendix.
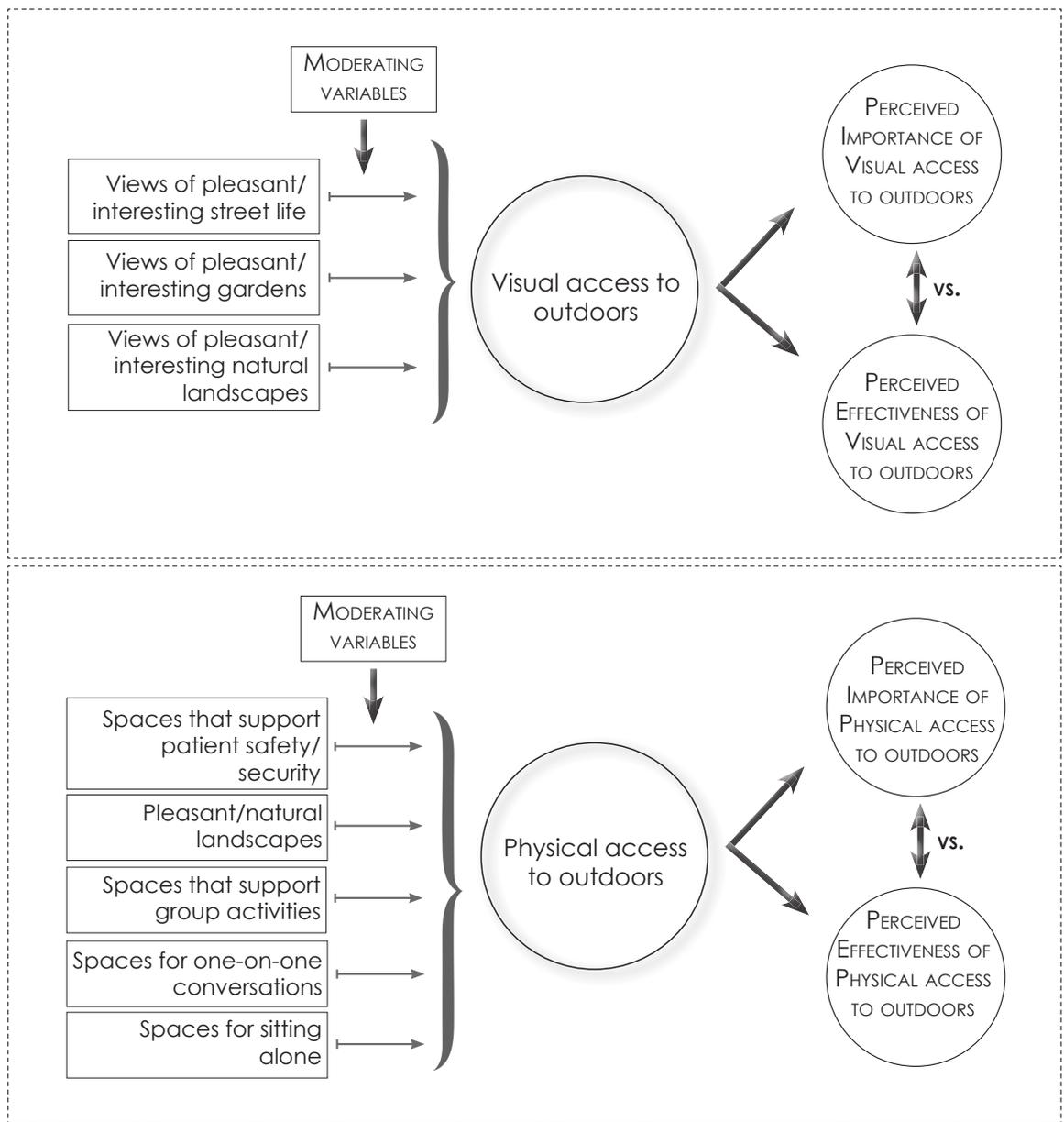
Figure 4.4. Summarizing the relationships for visual and physical access to the outdoors

4.4.3.5 Attractive and Aesthetically Pleasing

Of the following categories—deinstitutionalized environments, orderly and organized environments, attractive and aesthetic environments, well-maintained environments, and visual and physical access to the outdoors—attractive and aesthetically pleasing environments were considered to be the third-most important category. Of these categories, it was also rated as the one that respondents' current facilities were third-most-effective in providing. Figure 4.5 graphically summarizes the relationships.

The mean score of the importance of an attractive and aesthetically pleasing environment in a mental or behavioral health facility was 5.92 (SD=.947). The

mean score of the effectiveness of respondents' current facilities in providing an attractive and aesthetically pleasing environment was 4.43 (SD=1.644). After performing a Mann-Whitney U test, importance scores for an attractive and aesthetically pleasing environment were found to be significantly higher than effectiveness scores (p<.001).

The characteristics that contribute to an attractive and aesthetically pleasing environment were ranked in order of importance from most to least, with lower means indicating a ranking closer to 1 or "most important": window views of the outdoors (M=2.01, SD=1.41), well- designed electric lighting and day lighting (M=2.86, SD=1.471), natural complexity without compromising orderliness (M=3.60, SD=1.505), art depicting nature (M=3.76, SD=1.363), colorful furniture and furnishings (M=4.17, SD=1.449), abstract art (M=4.957, SD=1.608), and other characteristics (M=6.63, SD=1.358).

A Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction showed the only significant stepwise comparison of these characteristics is between the sixth-ranked characteristic (abstract art) and the seventh-ranked characteristic ('other') (p<.001). However, there are several significant differences between non-stepwise rankings, such as between the first-ranked characteristic (window views of the outdoors) and the third-ranked (natural complexity without compromising orderliness) (p<.001), between the second-ranked (well designed electric lighting and day lighting) and the fourth-ranked (art depicting nature) (p<.05), and between the third-ranked (natural complexity without compromising orderliness) and the sixth-ranked (abstract art) (p<.001), and finally between the fourth-ranked (art depicting nature) and the sixth-ranked (abstract art) (p<.05). For full results of the Kruskal-Wallis one-way ANOVA and the multiple comparison post-hoc, see the Appendix.
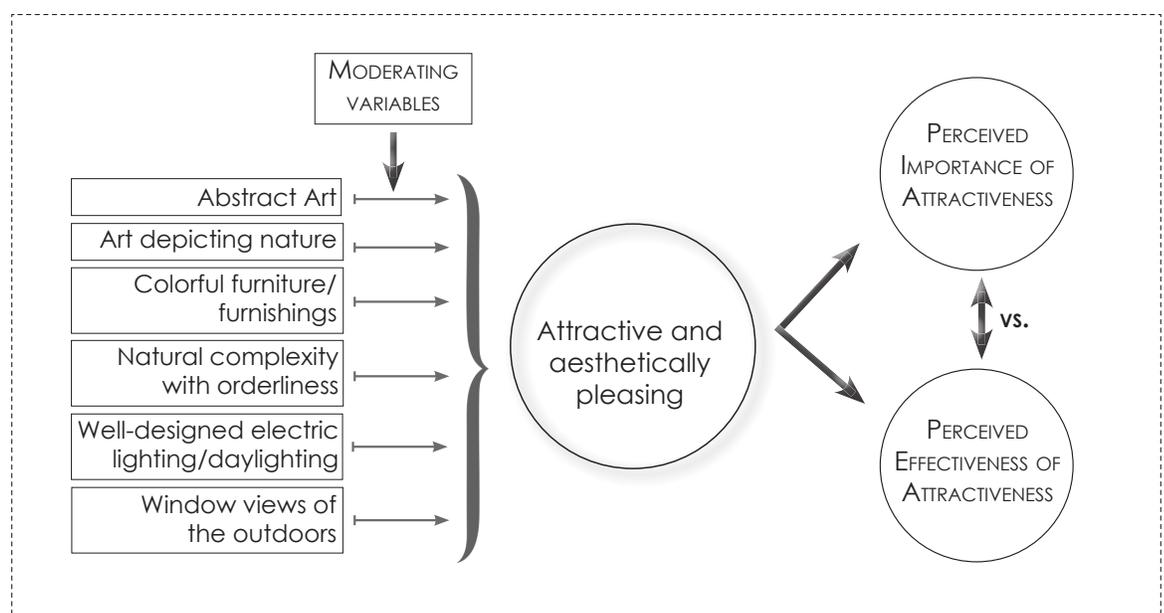

Figure 4.5. Summarizing the relationships for attractive and aesthetically pleasing environment

4.4.4. Specific Environmental Features

In this section we discuss damage-resistant furniture, attractive furniture, comfortable furniture, good electric lighting, good day lighting, noise control, staff safety and security, and spaces for staff respite. We also discuss the adjacency of mental or behavioral health facilities to general hospitals. Figure 4.6 graphically summarizes the relationships.

According to a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction, the only significant difference between the importance scores of the following categories is between the last-ranked and second-to-last-ranked categories ($p < .05$) (attractive furniture and spaces for staff respite, respectively). However, there are several significant differences between non-stepwise rankings, such as between the first-ranked category (good staff safety and security) and the fourth-ranked (comfortable furniture)($p < .001$); between the second-ranked category (noise control) and the sixth-ranked (damage-resistant furniture) ($p < .05$); the third-ranked category (good day lighting) and the eighth-ranked category (attractive furniture) ($p < .001$); the fourth-ranked (comfortable furniture) and the eighth-ranked (attractive furniture) ($p < .001$); and the fifth-ranked (good electric lighting) and eighth-ranked (attractive furniture) categories ($p < .05$). For full results of the Kruskal-Wallis one-way ANOVA and the multiple comparison post-hoc, see the Appendix.

According to a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction, there are no stepwise significant differences between categories in terms of effectiveness. However, the lowest-scoring category (noise control) is significantly lower than the four highest-scoring categories: good electric lighting ($p < .001$), damage-resistant furniture ($p < .001$), staff safety/security ($p < .001$), and good day lighting ($p < .05$) (listed here in order of first-most effective to fourth-most effective). In addition, the second-lowest scoring category, spaces for staff respite, is significantly lower than the three top categories: good electric lighting ($p < .001$), damage-resistant furniture ($p < .05$), and staff safety and security ($p < .05$). For full results of the Kruskal-Wallis one-way ANOVA and the multiple comparison post-hoc, see the Appendix.
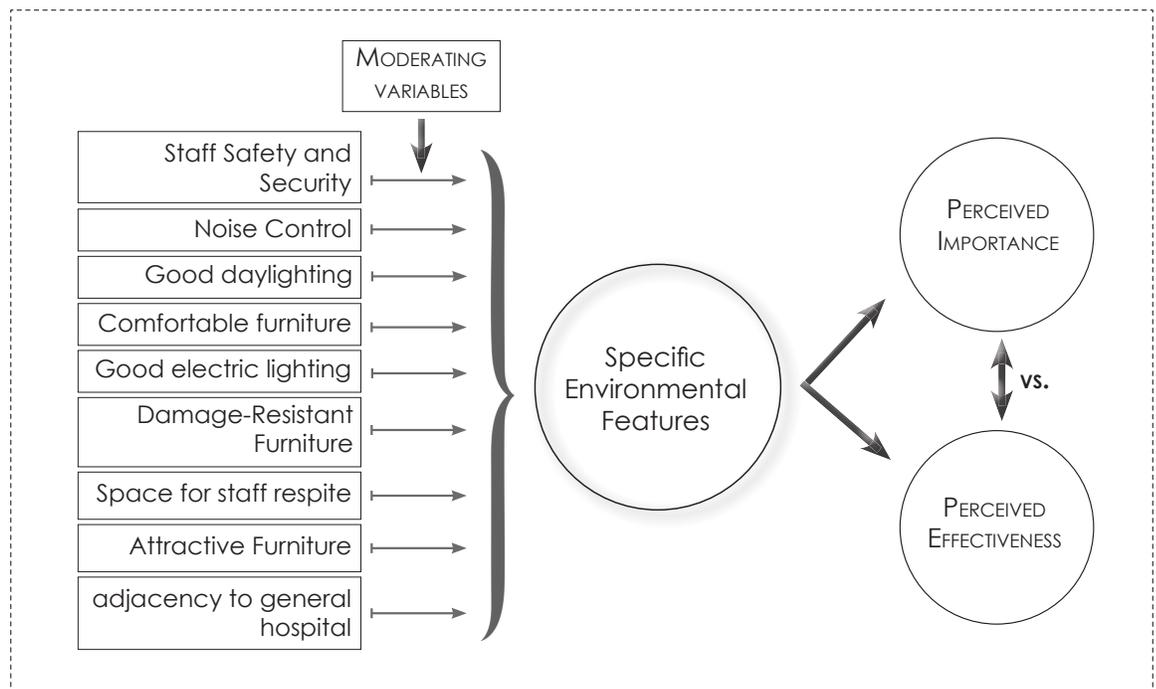
Figure 4.6. Summarizing the relationships for specific environmental features

4.4.4.1. Staff Safety and Security

Of the aforementioned physical environmental features, staff safety and security was considered to be the most important. The mean score of the importance of staff safety and security was 6.60 on a 7-point Likert scale (SD=.842). Staff safety and security was considered to be the third-most-effective physical environmental feature in respondents' current facilities. The mean score of the effectiveness of staff safety and security was 5.12 on a 7-point Likert scale (SD=1.497). After performing a Mann-Whitney U test, the importance scores for staff safety and security were found to be significantly higher than effectiveness scores (p<.001).

4.4.4.2. Noise Control

Of the aforementioned physical environmental features, noise control was considered to be the second-most-important feature. The mean score of the importance of good noise control was 6.38 on a 7-point Likert scale (SD=.742). However, noise control was found to be the least effective physical environmental feature in respondents' current facilities. The mean score of the effectiveness of noise control was 3.81 on a 7-point Likert scale (SD=1.831). A Mann-Whitney U test revealed that the importance scores for good noise control were significantly higher than effectiveness scores (p<.001).

4.4.4.3. Good Day Lighting

Of the aforementioned physical environmental features, good day lighting

was considered to be the third-most-important feature. The mean score of the importance of good day lighting in the respondents' current facilities was 6.33 on a 7-point Likert scale (SD=.746). Good day lighting was considered to be the fourth-most-effective physical environmental feature in respondents' current facilities. The mean score of the effectiveness of good day lighting was 4.79 on a 7-point Likert scale (SD=1.609). A Mann-Whitney U test showed that the importance scores for good day lighting were significantly higher than effectiveness scores (p<.001).

4.4.4.4. Comfortable Furniture

Of the aforementioned physical environmental features, comfortable furniture was considered to be the fourth-most-important feature. The mean score of the importance of comfortable furniture was 6.11 on a 7-point Likert scale (SD=.781). Comfortable furniture was found to be the third-least-effective physical environmental feature in respondents' current facilities, tied with attractive furniture. The mean score of the effectiveness of comfortable furniture in the respondents' current facilities was 4.55 on a 7-point Likert scale (SD=1.376). After performing a Mann-Whitney U test, the importance scores for comfortable furniture were found to be significantly higher than effectiveness scores (p<.001).

4.4.4.5. Good Electric Lighting

Of the aforementioned physical environmental features, good electric lighting was considered to be the fourth-least-important feature. The mean score of the importance of good electric lighting was 6.09 on a 7-point Likert scale (SD=.740). Good electric lighting was considered to be the most effective physical environmental feature in respondents' current facilities. The mean score of the effectiveness of good electric lighting in the respondents' current facilities was 5.21 on a 7-point Likert scale (SD=1.329). Even so, a Mann-Whitney U test showed that the importance scores for good electric lighting were significantly higher than effectiveness scores (p<.001).

Source: https://pixabay.com/en/climate-place-furniture-restaurant-1368872/

4.4.4.6. Damage-Resistant Furniture

Of the aforementioned physical environmental features, damage-resistant furniture was considered to be the third-least-important feature. The mean score of the importance of damage resistant furniture was 5.90 on a 7-point Likert scale (SD=1.146). Damage-resistant furniture was shown to be the second-most-effective physical environmental feature in respondents' current facilities. The mean score of the effectiveness of damage resistant furniture in the respondents' current facilities was 5.15 on a 7-point Likert scale (SD=1.307). After performing a Mann-Whitney U test, importance scores for damage-resistant furniture were found to be significantly higher than effectiveness scores (p<.001).

4.4.4.7. Space for Staff Respite

Of the aforementioned physical environmental features, space for staff respite was considered to be the second-least-important physical environmental feature. The mean score of the importance of spaces for staff respite was 5.87 on a 7-point Likert scale (SD=1.334). Space for staff respite was also considered to be the second-least-effective physical environmental feature in the respondents' current facilities. The mean score of the effectiveness of spaces for staff respite in the respondents' current facilities was 4.11 on a 7-point Likert scale (SD=1.725). A Mann-Whitney U test revealed that importance scores for spaces for staff respite were significantly higher than effectiveness scores (p<.001).

4.4.4.8. Attractive Furniture

Of the aforementioned physical environmental features, attractive furniture was considered to be the least important feature. The mean score of the importance of attractive furniture was 5.53 on a 7-point Likert scale (SD=1.004). Attractive furniture was considered to be the third-least-effective physical environmental feature in respondents' current facilities, tied with comfortable furniture. The mean score of the effectiveness of attractive furniture in the respondents' current facilities was 4.55 on a 7-point Likert scale (SD=1.478). A Mann-Whitney U test showed that the importance scores for attractive furniture were significantly higher than effectiveness scores (p<.001).

4.4.4.9. Adjacency to General Hospital

As mentioned earlier, 53 respondents indicated that their facility was physically attached to or adjacent to a general hospital, whereas 48 respondents said that their facility was not. The mean importance score of the physical attachment or adjacency of a mental/behavioral health facility to a general hospital is 4.32 (SD=1.925), on a 7-point Likert scale.

4.4.4.10. Moderating Variables

There was no significant relationship between primary job title and importance scores for deinstitutionalized environments, orderly and organized environments, attractive and aesthetic environments, well-maintained environments, and

visual and physical access to the outdoors, according to a Chi-Square test of association. However, there was a significant relationship between primary job title and the effectiveness scores of respondents' current facilities in providing deinstitutionalized environments (p<.05), attractive and aesthetically pleasing environments (p<.05), and quality landscaping and visual and physical access to the outdoors (p<.001). In addition, there was a significant relationship between length of time in the field of mental or behavioral healthcare and importance scores for attractive and aesthetically pleasing environments (p<.001) and well-maintained environments (p<.05). For cross-tabulations of these variables, see the Appendix. According to a Chi-Square test of association, there did not appear to be a significant relationship between the importance or effectiveness of quality landscaping based on the surroundings of the facilities (rural, urban, or suburban).

4.4.4.11. Additional Comments

In the additional comments left by respondents themes emerged that were addressed elsewhere: providing adequate day lighting, access to nature (visually or physically), staff respite, and designing flexible spaces that consider the needs of a variety of patient populations. Medical issues to be considered included: delirium, floor mats to minimize the risk of injuries from falls, private bathrooms, especially for transgender individuals. One respondent suggested that a balance be struck between safety, privacy, and community. A particularly strong theme in the additional comments was the need for staff input in the planning and design process.

4.4.5. Inpatient Survey Questions

4.4.5.1. Private Patient Bedrooms and Baths

The mean importance score of private patient bedrooms was 5.84 (SD=.954), on a 7-point Likert scale. Respondents indicated that most of their facilities had 'some' private bedrooms (n=27), followed by 'none' (n=11), 'most' (n=9) and 'all' (n=9), with the fewest number of facilities having private bedrooms comprising 'half' of all bedrooms (n=6). The mean importance score of private patient bathrooms was 5.82 (SD=1.066), on a 7-point Likert scale. Most respondents indicated that their facilities had no private patient bathrooms (n=17), followed by 'some' private bathrooms (n=16), 'all' private bathrooms (n=13), 'most' private bathrooms (n=9), and 'half' private bathrooms (n=6).

4.4.5.2. Staff-Patient Interaction and Patient Observation

The importance of environmental features that contribute to staff-patient interaction and patient observation were ranked in order of importance from most to least, with higher scores indicating higher levels of importance: one-on-one consultation rooms (M=6.02, SD=.959), visual monitoring via windows (M=5.48, SD=1.306), open nurse stations (M=5.27, SD=1.609), visual monitoring via camera (M=5.19, SD=1.554), auditory monitoring (M=4.56, SD=1.616), and closed nurse stations (M=3.68, SD=1.839).

According to a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction, there are no stepwise significant differences between categories in terms of importance. However, there are significant differences between the first-ranked (one-on-one consultation rooms) and fourth-ranked (visual monitoring via camera) environmental features (p<.05), between the second-ranked (visual monitoring via window) and fifth-ranked(auditory monitoring) (p<.05), and between the fourth-ranked (visual monitoring via camera) and sixth-ranked (closed nurse stations) (p<.001). For full results of the Kruskal-Wallis one-way ANOVA and the multiple comparison post-hoc, see the Appendix.

The effectiveness of environmental features that contribute to staff-patient interaction and patient observation in the respondents' current facilities were ranked in order of effectiveness from most to least, with higher scores indicating higher levels of effectiveness: one-on-one consultation rooms (M=5.0, SD=1.482), open nurse stations (M=4.62, SD=1.851), visual monitoring via window (M=4.48, SD=1.686), visual monitoring via camera (M=4.34 SD=1.81), closed nurse stations (M=3.57, SD=1.943), and auditory monitoring (M=3.54, SD=1.747).

According to a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction, there are no significant stepwise differences between categories in terms of effectiveness. However, the highest-ranked environmental feature has a significantly higher score than the lowest-ranked (auditory monitoring) and second-lowest ranked feature (closed nurse stations) scores (p<.001). In addition, the second-highest-ranked score (open nurse stations) is also ranked significantly higher than the lowest-ranked-(auditory monitoring) and second-lowest-ranked feature (closed nurse stations) scores (p<.05).

After performing a Mann-Whitney U test, importance scores were found to be significantly higher than effectiveness scores for visual monitoring via camera (p<.05), visual monitoring via windows (p<.05), auditory monitoring (p<.05), one-on-one consultation rooms (p<.001), and open nurse stations (p<.05). However, while importance scores were higher than effectiveness scores for closed nurse stations, the difference was not significant.

4.4.5.3. Positive Distraction

Of the following categories—positive distraction, staff respite, social interaction and community, autonomy and spontaneity, and suicide resistance—positive distraction was second-most-important. The mean importance score of positive distraction was 6.57 on a 7-point Likert scale (SD=.607). According to a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction, positive distraction is significantly more important than staff respite (p<.05), social interaction and community (p<.001), and autonomy and spontaneity (p<.001).

Of the categories that make up positive distraction—staff respite, social

interaction and community, autonomy and spontaneity, and suicide resistance—the respondents' facilities were third-most-effective in providing positive distractions. The mean effectiveness score of positive distraction was 4.85 on a 7-point Likert scale (SD=1.249). According to a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction, positive distraction scores are significantly higher than autonomy and spontaneity (p<.05) and higher than staff respite scores (p<.001), and they were significantly lower than suicide resistance scores (p<.05). After performing a Mann-Whitney U test, importance scores for positive distractions were found to be significantly higher than effectiveness scores (p<.001).

The environmental amenities that contribute to positive distraction were ranked in order of importance from most to least, with lower means indicating a ranking closer to 1 or "most important"): music systems (M=3.37, SD=2.18), board games/playing cards/etc.(M=3.67, SD=1.884), books/magazines/newspapers (M=4.44, SD=1.865), television (M=4.52, SD=2.564), sports/recreation spaces (M=4.67, SD=2.20), pet therapy (M=,4.70 SD=2.298), exercise equipment (M=4.76, SD=2.291), video game systems (M=6.44, SD=2.022), and other (M=8.43, SD=1.94). While there is no significant distinction between the top seven amenities, the two lowest-ranking ones (video game systems and other amenities) are significantly lower than all of the top seven: music systems, board games etc., printed matter, TV, sports/recreation spaces, pet therapy, and exercise equipment (p<.05). This significance was shown by a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction.

4.4.5.4. Staff Respite

Of the following categories—positive distraction, staff respite, social interaction and community, autonomy and spontaneity, and suicide resistance—staff respite was considered to be third-most-important. The mean importance score of staff respite was 6.11 on a 7-point Likert scale (SD=.863). According to a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction, staff respite is significantly less important than suicide resistance (p<.001) and positive distraction (p<.05).

Of the categories of positive distraction, respondents' facilities were least effective in providing staff respite. The mean effectiveness score of staff respite was 3.46 on a 7-point Likert scale (SD=1.595). According to a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction, staff respite scores were significantly lower than positive distraction (p<.001), social interaction and community (p<.001), and suicide resistance scores (p<.001). After performing a Mann-Whitney U test, importance scores for staff respite were found to be significantly higher than effectiveness scores (p<.001).

The environmental amenities that contribute to staff respite were ranked in order of importance from most to least, with lower means indicating a ranking closer to 1 or "most important": staff-dedicated outdoor space (M=2.58, SD=1.153), private entrance to facility (M=2.89, SD=1.58), exercise room (M=3.08, SD=1.205), counseling rooms for staff (M=3.37, SD=1.346), staff nap room (M=4.00,

SD=1.727), and other amenities (M=5.08, SD=1.867). A Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction revealed that the only significant differences in these amenities is between the last-ranked category ('other') and all other amenities (p<.05) and between the second-to-last-ranked category (staff nap room) and the three top-ranked amenities: exercise room (p<.05), private entrance to facility (p<.05), and staff dedicated outdoor space (p<.001).

4.4.5.5. Social Interaction and Community

Of the following categories—positive distraction, staff respite, social interaction and community, autonomy and spontaneity, and suicide resistance—social interaction and community was ranked second-least-important. The mean importance score of social interaction and community was 6.00 on a 7-point Likert scale (SD=.678). According to a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction, social interaction and community is significantly less important than suicide resistance (p<.001) and positive distraction (p<.001).

Of the categories of positive distraction, respondents' facilities were second-most effective in providing social interaction and community. The mean effectiveness score of social interaction and community was 4.90 on a 7-point Likert scale (SD=1.179). According to a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction, social interaction and community scores are significantly higher than autonomy and spontaneity (p<.05) and staff respite scores (p<.001) and lower than suicide resistance scores (p<.05). After performing a Mann-Whitney U test, importance scores for social interaction and community were found to be significantly higher than effectiveness scores (p<.001).

The characteristics contributing to social interaction and community were ranked in order of importance from most to least, with lower means indicating a ranking closer to 1 or "most important"): shared group activity rooms (M=2.65, SD=1.28), shared eating spaces (M=2.73, SD=1.353), shared group therapy rooms (M=2.75, SD=1.691), shared outdoor spaces (M=3.73, SD=1.269), designated spaces for privacy (M=4.53, SD=1.752), shared sports and recreation spaces (M=4.62, SD=1.581), and other characteristics (M=7.00, SD=.00). A Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction showed that the only significant stepwise comparison was between the last- and second-to-last-ranked characteristics, 'other' and shared sports and recreation spaces, respectively (p<.001). Other significant comparisons include comparisons between the first-ranked (shared group activity rooms) and the fifth-ranked characteristics (designated spaces for privacy) (p<.001) and between the third-ranked (shared group therapy rooms) and sixth-ranked characteristics (shared sports and recreation spaces) (p<.001). For full results of the Kruskal-Wallis one-way ANOVA and the multiple comparison post-hoc, see the Appendix.

4.4.5.6. Autonomy and Spontaneity

Of the following categories—positive distraction, staff respite, social interaction and community, autonomy and spontaneity, and suicide resistance—autonomy and spontaneity was ranked least important. The mean importance score of autonomy and spontaneity was 5.84 on a 7-point Likert scale (SD=.807). According to a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction, spaces that support autonomy and spontaneity are significantly less important than suicide resistance (p<.001) and positive distraction (p<.001).

Of the categories of positive distraction, staff respite, social interaction and community, autonomy and spontaneity, and suicide resistance, respondents' facilities were second-least effective in providing spaces that support autonomy and spontaneity. The mean effectiveness score of autonomy and spontaneity was 3.92 on a 7-point Likert scale (SD=1.574). According to a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction, autonomy and spontaneity scores are significantly lower than positive distraction (p<.05), social interaction (p<.05), and suicide resistance scores (p<.001). After performing a Mann-Whitney U test, importance scores for autonomy and spontaneity were found to be significantly higher than effectiveness scores (p<.001).

The characteristics that contribute to autonomy and spontaneity were ranked in order of importance from most to least, with lower means indicating a ranking closer to 1 or "most important": open access to spaces that support personal safety (M=2.17, SD=1.591), open access to technology/entertainment amenities (M= 3.12, SD=1.365), open access to outdoor spaces (M=3.14, SD=1.48), open access to exercise areas (M= 3.28, SD=1.105), open access to snack areas or kitchen (M=3.29, SD=1.214), and other characteristics (M=6.00, SD=.00). A Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction revealed that the top-ranked characteristic—open access to spaces that support personal safety— is ranked significantly higher than all of the other aforementioned characteristics (p<.05). Additionally, all characteristics are ranked significantly higher than the 'other' category (p<.001).

4.4.5.7. Suicide Resistance

Of the following categories—positive distraction, staff respite, social interaction and community, autonomy and spontaneity, and suicide resistance—suicide resistance is considered to be the most important. The mean importance score of suicide resistance was 6.71 on a 7-point Likert scale (SD=.607). According to a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction, environmental features that resist suicide are significantly more important than staff respite (p<.001), social interaction and community (p<.001), and autonomy and spontaneity (p<.001).

Of the categories of positive distraction, staff respite, social interaction and community, autonomy and spontaneity, and suicide resistance, respondents'

facilities were most effective in providing physical environmental features that resist suicide. The mean effectiveness score of suicide resistance was 5.78 on a 7-point Likert scale (SD=.975). According to a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction, suicide resistance scores are significantly higher than all other scores: social interaction and community ($p < .05$), positive distraction ($p < .05$), autonomy and spontaneity ($p < .001$), and staff respite ($p < .001$). After performing a Mann-Whitney U test, importance scores for suicide resistance were found to be significantly higher than effectiveness scores ($p < .001$).

The characteristics contributing to suicide resistance were ranked in order of importance from most to least, with lower means indicating a ranking closer to 1 or "most important": anti-ligature furniture/hardware/fixtures (M=1.55, SD=.872), visibility of patients from nurse station (M=2.67, SD=1.398), suicide-resistant materials (such as mirrors) (M=2.70, SD=.869), shared bathrooms or supervised bathroom entrances (M=3.93, SD=.918), shared patient bedrooms (M=4.38, SD=.993), and other characteristics (M=5.77, SD=1.031). A Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction revealed that all comparisons between different characteristics are significant except for the second-ranked (visibility of patients from nurse station) and third-ranked (suicide-resistant materials) and for the fourth- (shared bathrooms or supervised bathroom entrance) and fifth-ranked characteristics (shared patient bedrooms).

4.4.5.8. Specific Environmental Features not Discussed Elsewhere

Of the following physical environmental features—designated smoking areas, direct observation from nurse station, indoor space for therapeutic activities, and private areas for staff/patient interaction—indoor space for therapeutic activities was considered the most important feature (M=6.46, SD.82). This was followed by private areas for staff/patient interaction (M= 6.35, SD=.87), direct observation from nurse station (M=6.08, SD=1.182), and designated smoking areas (M=3.49, SD=2.395). A Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction show that the lowest-ranked environmental feature (designated smoking areas) is ranked significantly lower than all other environmental features: direct observation from nurse station, private areas for staff/patient interaction, and indoor space for therapeutic activities ($p < .001$). These three higher-ranked features are not significantly different from one another.

Of the physical environmental features of designated smoking areas, direct observation from nurse station, indoor space for therapeutic activities, and private areas for staff/patient interaction, indoor space for therapeutic activities was considered the most effective feature (M= 5.03, SD=1.515). This is followed by direct observation from nurse station (M= 4.81, SD=1.754), private areas for staff/patient interaction (M=4.79, SD=1.631), and designated smoking areas (M= 3.5, SD=2.143). As with the importance scores, a Kruskal-Wallis one-way ANOVA with pairwise multiple comparisons and a Dunn-Bonferroni correction reveal that the lowest-ranked environmental feature in terms of effectiveness (designated

smoking areas) is ranked significantly lower than all other environmental features, including direct observation from nurse station, private areas for staff/patient interaction, and indoor space for therapeutic activities (p<.001). These three higher-ranked features are not significantly different from one another. For direct observation from nurse station, indoor space for therapeutic activities, and private areas for staff/patient interaction, a Mann-Whitney U test shows that importance scores are significantly higher than effectiveness scores (p<.001). However, the importance and effectiveness scores of designated smoking areas do not show any significant difference.

A mix of seating arrangements or different groupings of chairs and furniture to encourage social interaction received a mean importance score of 5.51 (SD=1.203) and a mean effectiveness score of 4.33 (SD=1.63). After performing a Mann-Whitney U test, importance scores for a mix of seating arrangements were found to be significantly higher than effectiveness scores (p<.001).

4.4.5.9. Moderating Variables

A Chi-Square test of association revealed a significant relationship between the portion of private bedrooms in the respondents' current facilities and the importance scores of private patient bedrooms in mental and behavioral health facilities (p<.05). In addition, average patient length of stay and the number of beds in a typical unit were significantly related to the importance scores of open nurse stations (p<.05). For cross-tabulations of these variables, see the Appendix. Length of stay, beds per unit, and size of facility (number of patient beds) was not significantly related to importance scores of positive distraction, staff respite, social interaction and community, autonomy and spontaneity, or suicide resistance.

The mean score of the importance of unit size (number of patients in a unit) in a mental or behavioral health facility was 6.13 (SD=.833) on a 7-point Likert scale. The majority of respondents (n=45) indicated that 11 to 20 was the appropriate number of beds in each inpatient unit, followed by 21 to 30 (n=10) and 1 to 10 (n=8).
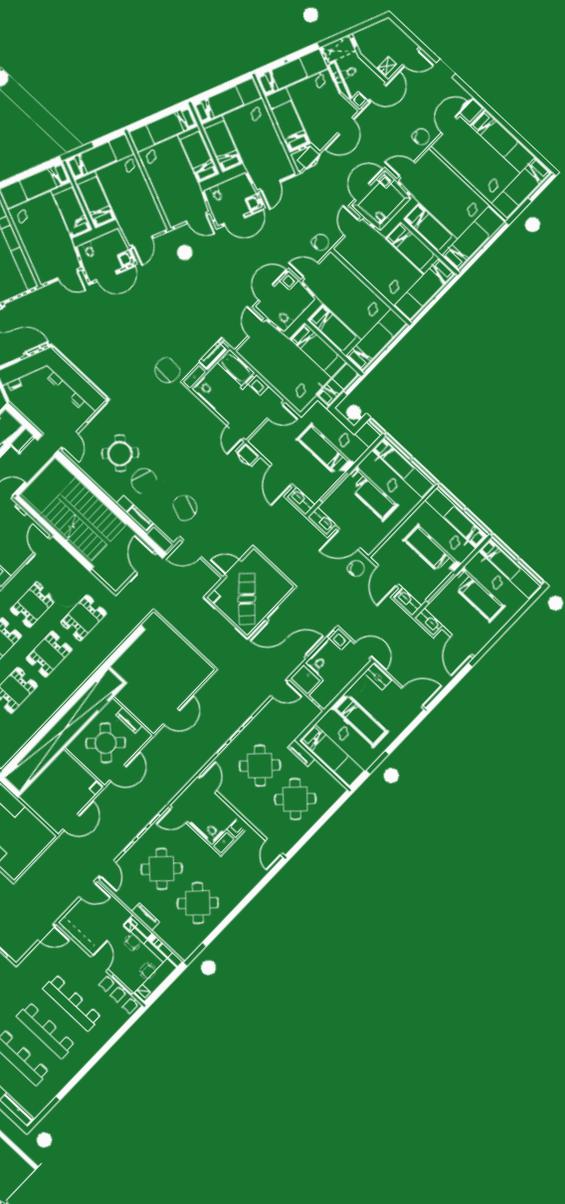
5.DISCUSSION

5. DISCUSSION

We approach a discussion of the results by summarizing the findings of the interviews, focus group, and surveys separately and then juxtaposing their conclusions.

5.1   Interviews

Because the data from the interviews is dense, a discussion of the results is facilitated by the summary provided in Figure 5.1. Overall, almost all of the topics derived from the literature review were appropriate for the survey. Some were challenged (order/organization and autonomy/spontaneity) because the definitions of these terms were unclear. The topic of suicide was generally thought to have been previously addressed, but due to the critical need to protect life, it was retained. The topic of smoking was neither objected to nor supported, as most people perceived it to be a non-issue due to smoking restrictions in many buildings and the availability of nicotine patches. This issue has been addressed in the press regarding patients' rights and therapeutic implications (Megan, 2007).

The strength of responses to two of the topics was unexpected: access to nature and an aesthetic environment. These environmental features are often seen as amenities or extras rather than core components. However, all interviewees indicated that they were important considerations.

Two topics were highly controversial: private versus shared bedrooms and open versus closed nurse stations. The majority of interviewees felt that private rooms were highly desirable because these rooms reflect a less institutional environment. However, a few people were adamantly opposed to private rooms because they believed that the increased supervision of one patient by another in a shared bedroom can be a deterrent to self-harm. The point was also made that private rooms increase construction costs and could potentially increase staffing costs due to the greater difficulty of supervising larger areas. The point was also made that patients have vastly different diagnoses and therefore are likely to need different kinds of care. For example, residents of drug rehabilitation facilities might provoke less concern about self-harm than chronically depressed patients. For this reason, many facilities are providing a range of room types, which can be useful, although it also can cause controversy as most patients desire private rooms.

The debate about open versus closed nurse stations centers on the protection and safety of staffers as well as the protection, safety, and normalization of patients. Staffers need to have the highest possible level of observation of patients and direct interaction with them. Planetree (an organization founded on patient-centered care) proponents have long advocated open staff stations. On the other hand, staffers in units with potentially violent patients consider the nurse's station as a place of retreat in case of an emergency. Two interviewees mentioned a hybrid station, although the attributes of this option are unclear. Another possibility is a nurse station that can be easily transformed to become

less of a barrier.

In conclusion, our research team strongly suggests that future research on behavioral health facilities focus on two questions: the relationship between private patient rooms and suicide attempts (or other undesirable outcomes) and open versus closed nurse stations and the outcomes associated with each.

1. Deinstitutionalized & homelike environment	• Majority thought this was an appropriate question for survey. • Staff not always aware of institutional quality. • Differing definitions of deinstitutionalized and homelike. • A home might have negative associations for some patients.
2. Orderly & organized environment	• Majority thought this was an appropriate question for survey; but there were two adamant dissenters. • Order needs to be provided without compromising richness.
3. Well-maintained environment	• Majority thought this was an appropriate question for survey. • A well-maintained environment communicates a sense of respect to the patients, and possibly reduces occurrence of violence.
4. Visual & physical access to nature	• Majority thought this was an appropriate question for survey. • Nature believed to contribute to aesthetics, healing, social interaction. • Concern about safety from plants and rocks and possible location for negative behaviors. • Visual access good. Physical access better.
5. Damage-resistant & attractive furnishings	• Majority thought this was an appropriate question for survey. • Challenges to creating furnishings simultaneously damage-resistant and attractive. Damage-resistant furniture/furnishings may encourage patients to destroy it. • Is representative of the culture of the environment.
6. Maximum daylight	• Majority thought this was an appropriate question for survey. • Uncertainty about how much to provide and the role of electric light. • Positive impact on circadian rhythms. • Important to provide flexible light levels for different patients. • May be more important than views outdoors.
7. Staff safety & security	• Majority thought this was an appropriate question for survey. • Private spaces need high visibility via direct supervision, windows, or surveillance
8. Private vs. shared bedrooms and bathrooms	• Majority thought this was an appropriate question for survey. • Many thought private bedrooms contributed to a normalized experience. • Problems were associated with increased cost and difficulties supervising a larger unit. • Shared rooms allow for co-supervision and socialization. • Private vs. shared choice should relate to patient diagnosis/status.
9. Patient-staff interaction & observation	• Majority thought this was an appropriate question for survey. • Could be located in private rooms, multi-function rooms or outdoor spaces.
10. Social interaction	• Majority thought this was an appropriate question for survey. • Dayrooms, as a primary location for interaction, were said to need clearer definition. • Facilitating social activities was thought to be critical to healing.
11. Autonomy & spontaneity	• A smaller majority thought this was an appropriate question for survey in part because the definition of these objectives was unclear. appropriate despite unclear objectives? • Amenities such as spaces that support ADL were encouraged. ADL?? Define? • Autonomy and spontaneity said to be similar to choice and control.
12. Suicide-resistant furniture, furnishings & equipment	• Majority thought this was an appropriate question due to potential ramifications of lack. • There were varied opinions on whether current protocols were effective. • Anti-ligature features should be "camouflaged" as they can be demeaning. • One respondent indicated that design is limited in its ability to impact suicide.

13. Mix of seating	• Majority thought this was an appropriate question for survey. • Seating arrangements should address various needs and be flexible.
14. Smoking rooms	• Majority thought this was a marginally appropriate question for survey. • The topic has become less critical. • Two respondents noted the difficulty patients face when relocating to a psychiatric environment and being forced to make changes in their personal habits.
15. Nurse station	• Majority thought this was an appropriate question for survey. • Patient visibility is critical but must be balanced with staff safety. • Discussion focused on closed versus open stations and staff safety vs. patient safety. • Closed stations may instigate patient aggression. • Semi-open stations recommended.
16. Indoor & outdoor therapy	• Majority thought this was an appropriate question for survey. • Therapeutic activities contribute to health; may be critical to physical health. • Quiet spaces should be an option for patients. • Should be multi-use. • Spaces for athletics, horticulture, and activities contributing to positive distraction.
17. Staff respite	• Majority thought this was an appropriate question for survey. • Support was provided for "off-stage" spaces. • May be appropriate only for inpatient spaces. • May be more focused on staff training than staff environments.

Figure 5.1: Interview summaries

5.2   Focus group

As mentioned in Section 4.3 of this report, eight additional topics were generated in the interviews and focus group. Their context within the literature is summarized below, rather than in Section 2, "Literature Review," because the role of these factors did not surface until after the interviews and focus group.

5.2.1.   Attractive/aesthetic space

The role of aesthetics in healthcare facilities has been extensively discussed. Caspari, Eriksson and Naden (2006, 2007, 2011) argued that it is a critical factor in healthcare environments and must be included in the programming process. Moss and O'Neil (2014) suggested that aesthetic and cultural programming in healthcare settings need to be carefully selected and nuanced for various stages of illness and recovery. Moss, Donnellan, and O'Neil (2015) referred to three major areas of healthcare settings in which arts and aesthetics particularly play important roles, namely the arts as a clinical or therapeutic intervention, the arts in enhancing the built environment and building design, and the arts as part of "medical humanities training."

5.2.2.   Attractive and comfortable furniture

Attractive furniture was identified by psychiatric staffers in a study by Schroder and Ahlstrom (2004) as being critical to support a quality of care environment. Using comfortable and home-like furniture, soft soothing furnishings, calming and soft music, and installation of art and crafts could relieve distress and enhance patient self-esteem and comfort (Cummings, Grandfield & Coldwell, 2010; Muskett, 2014). Additional discussion on this topic is provided in Section 2, "Literature Review."

5.2.3. Good electric lighting

Karlin and Zeiss (2006) make multiple recommendations on lighting, including the avoidance of spotlights that might focus on individuals and the use of lighting to designate space. Moye, Domingos, Pittman, et al. (1997) found that low levels of light may create agitation. In a long-term care facility, residents reported that brighter lights positively impact their experience and they recommended continued use of them. Van Hoof and Verkerk (2013) referred to the benefits of high-intensity lighting for improving circadian rhythmicity in patients with dementia and slowing down their cognitive decline. Having control over lighting was deemed desirable in a psychiatric inpatient facility (Kuosmanen, Makkonen, Lehtila & Salminen, 2015). Devlin (1994) found improvements in a pre- and post-evaluation involving improved furnishings, plants, and lighting.

5.2.4. Noise control

Acoustical control is one of the components of a salutogenic psychiatric environment (one that focuses on wellness rather than disease). Golembiewski (2010) summarizes Antonovsky's theory by suggesting that a state of mind with greater coherence is more likely to heal. Noise is an element known to reduce coherence and multiple studies have demonstrated the negative impact of noise on elevating stress, impeding recovery, and disturbing sleep among staff and patients (Brown et al., 2015). Brown et al. (2015) reviewed the literature on negative effects of noise as an environmental stressor in healthcare environments and identified its potential to cause both physiological and psychological harm. Noise has been shown to increase one's vulnerability by negatively affecting almost all aspects of daily life and diminishing one's ability to adapt physiologically or psychologically to other stressors. The fact that patients in mental health care settings may experience high levels of unwanted noise, which is not controllable from their point of view and further intensifies the experience of stress (Brown et al., 2015).

5.2.5. Impact of experience

Several researchers have found that the tenure of psychiatric nurses impacts their attitudes towards patients and their profession. For example, Sveinbjarnardottir, Svavarsdottir and Saveman (2011) found that education and training influenced psychiatric nurses' attitudes toward family involvement. Roche, Diers, Duffield and Catling-Paull (2010) found that experienced nurses would be more likely to anticipate conditions that might lead to violence, especially by psychiatric patients. Anxiety, pain, powerlessness, loss of control, and disorientation could be among the reasons for aggressive episodes by patients against nurses (Roche et al., 2010).

5.2.6. Positive distraction

Positive distraction has not been researched in mental health facilities, per se; however, the introduction of distraction features has been found to have a positive impact on patients and staff in both outpatient settings (Pati and Nanda,

2011) and inpatient settings (Shepley, 2006). Nanda, Eisen, Zadeh and Owen (2011) in a study investigating the impact of visual art portraying restorative nature scenes, concluded that positive distractions could alleviate symptoms of anxiety and agitation among mental health patients in healthcare settings. Van der Schaaf, Dusseldorp, Keuning, Janssen and Noorthoorn (2013) concluded that spaces where patients could be alone and get away from others may increase well-being by offering positive distraction and buffering some of the adverse effects of crowding.

5.2.7. Impact of length of stay

Positive distraction bears a direct relationship to the boredom associated with long lengths of stay in a psychiatric facility. We argue that the longer a person experiences a particular space, the less interesting and stimulating it becomes and the more critical to wellness positive distractions become. Multiple researchers have suggested that boredom is a problem in long-term hospitals (Wilcox, 1974). Newell, Harries and Ayers (2011) explored boredom proneness in mental health patients according to age, diagnosis, and gender. Data from the Mental Health Act status report and length of stay in an acute psychiatric ward were used to test the hypothesis that there is a negative correlation between boredom and autonomous activity and boredom and diagnoses of depression. The former suggests that lack of activity is problematic, although LOS was not directly related. Muir-Cochrane, et al. (2013) in a qualitative study exploring behavior related to absconding in an Australian inpatient psychiatric unit, identified lack of freedom, boredom, isolation, and feelings of loneliness as major reasons leading to absconding, along with lack of structured and educational activities. Boredom was identified as having a major impact on impairing the functioning of the psychiatric facility as a therapeutic landscape, exacerbating symptoms among the patients, and negatively affecting the facility as a safe environment (Muir-Cochrane et al., 2013). Chrysikou (2013) in reviewing accessibility and patient movement in 10 community mental healthcare facilities in Great Britain and France, noticed that the organizational separation of the ward, day areas, and therapy areas, which was achieved by vertical circulation, resulted in considerable limitation of patients' free access to the areas. Chrysikou (2013) refers to this organizational separation responsible for boredom as being the most reported problem in UK mental healthcare facilities and one that has very detrimental effects on mental health.

5.2.8. Impact of unit size

One of the best-known studies on unit size was the study by Wilson, Soth, and Robak (1992) on adolescent residential units. Researchers examined the impact of transitioning from a 40-bed unit to four 10-bed units and found a reduction in vandalism, acting out, and theft. Patients tended to identify more effectively with their unit, which engendered a feeling of security and belonging, efficacy, and involvement. Staff expressed greater satisfaction. The disadvantages included patient restlessness due to the more confined space and reluctance to engage with the broader hospital milieu. Ling Wong, Shaw, Proctor, and Caulfield (2015) identified small unit sizes in psychiatric intensive care units as an important

environmental factor leading to reduced rates of seclusion.

5.3   Surveys

5.3.1   Subject demographics

The subjects in this study were very experienced. Approximately 70% had more than 15 years of work experience in psychiatric facilities. (See Figure 5.2.) These figures are comparable to national statistics in the United States, Australia, and Canada.

Sixty percent of the respondents were psychiatric nurses. (See Figure 5.3.) This is not surprising as the organizations that received the surveys were dedicated to psychiatric nurses. Their memberships were typically open to related professions, although the distribution in a typical facility would have different proportions. It should be noted that the 2014 WHO Atlas report on mental health showed that globally, nurses comprise the single largest group of workers (40 to 60%) in the mental health workforce. Other titles provided by subjects besides Registered Nurses (RN) included: Psychiatric Licensed Practical Nurses (LPN), clinical psychologists, mental health counselors, occupational therapists and social workers; treatment managers and educators; and Non-Licensed Personnel, such as mental health technicians and patient safety attendants.
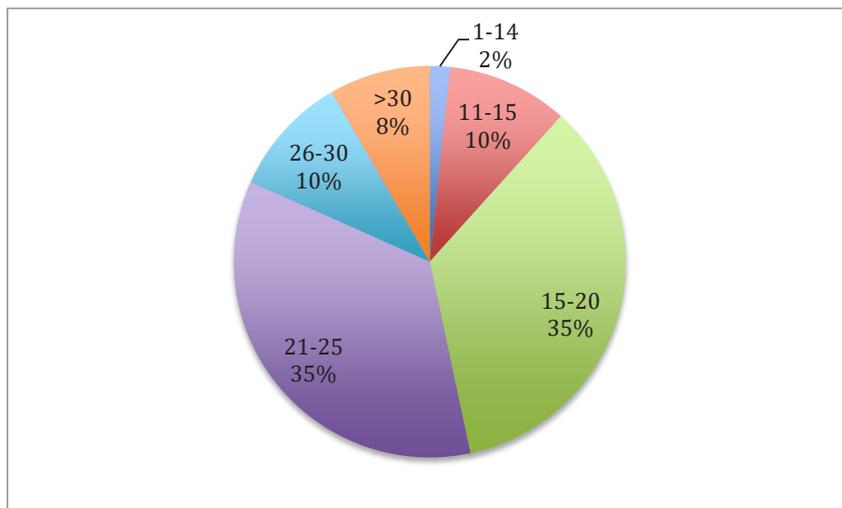
Figure 5.2: Years of experience of respondents
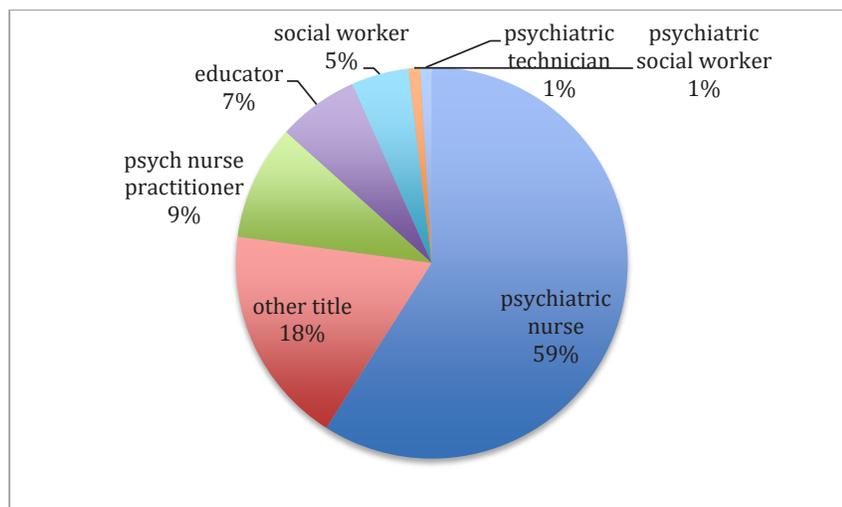
Figure 5.3: Professions of respondents

5.3.2. Facility descriptions

Half of the respondents were affiliated with residential facilities, and almost a quarter were associated with outpatient facilities. (See Figure 5.4.) For this question, respondents were allowed to respond to more than one category. Some of these individuals may be working at facilities that provide both outpatient and residential treatment. The "Other" category included: for-profit research institutions and state facilities, including forensic and Veterans Affairs facilities.
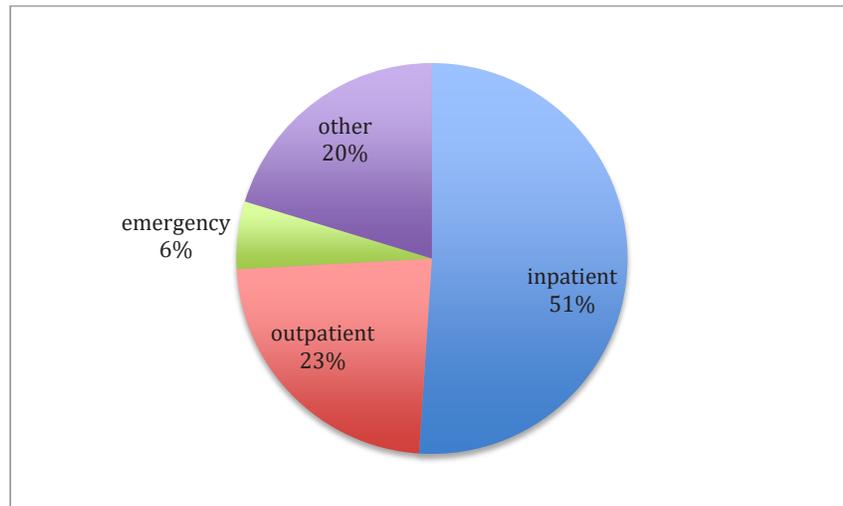
Figure 5.4 Facility type

The highest response rates were from the United States and Australia. (See Figure 5.5.) The 2015 WHO Mental Health Atlas indicated that in the international distribution of psychiatric nurses, the EURO district has the largest median of nurses working in mental health facilities, followed by The Americas—including the United States—and the Western Pacific Region—including Australia. Across all WHO regions, the greatest number of mental health workers are in inpatient and day care services. The study shows similar trends in facilities dedicated to mental health inpatients.
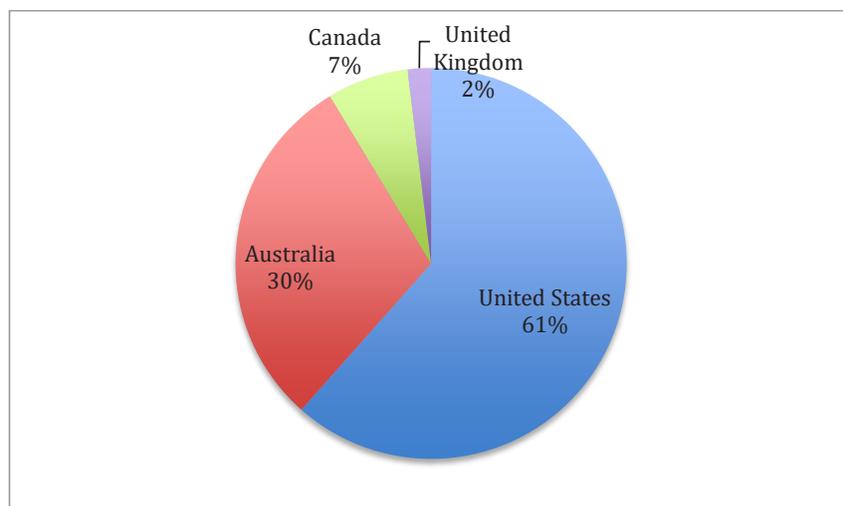
Figure 5.5: Subject/facility location

Subjects in this study of facilities were working with patients who have a broad range of diagnoses. (See Figure 5.6.) The issue of diagnosis is complicated because many patients present with a variety of diagnoses and some make transitions between diagnoses (Spitzer, Endicott & Robins, 1978). The subjects' diagnoses are roughly similar to national and international data. A study by Kessler et al. (2009) that reviews the WHO World Mental Health surveys on the global burden of mental health disorders found that anxiety disorders were the most prevalent, followed by mood disorders, externalizing disorders including ADHD, substance use disorders, and impulse-control disorders. Kessler et al. (2005) in a study based on replication of the National Co-morbidity Survey in the US, found that anxiety disorders were the most prevalent mental health disorder in the US, followed by impulse-control disorders, mood disorders and substance use disorders.
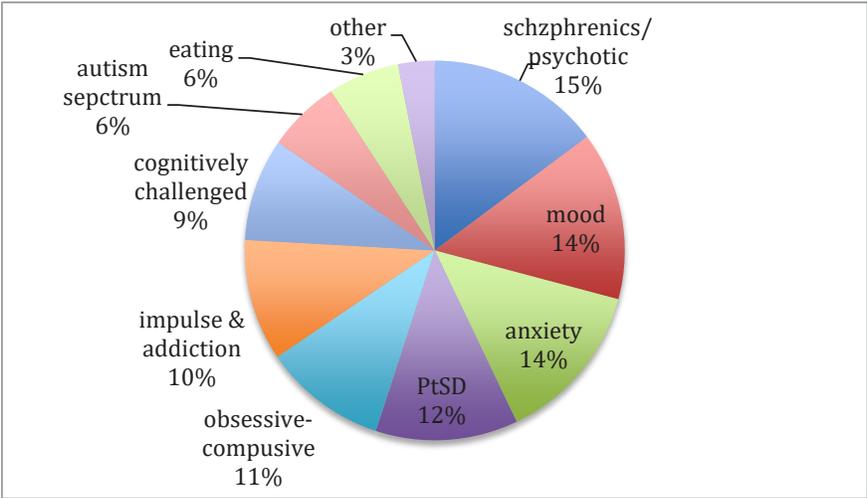
Figure 5.6: Patient diagnosis

Among the questions in the survey was one on the number of holding rooms in a hospital's ER. (See Figure 5.7.) Forty-three percent had 10 holding rooms or fewer, while 14% had more than 20 beds. We were unable to find data suggesting that this distribution is similar to national and international figures.
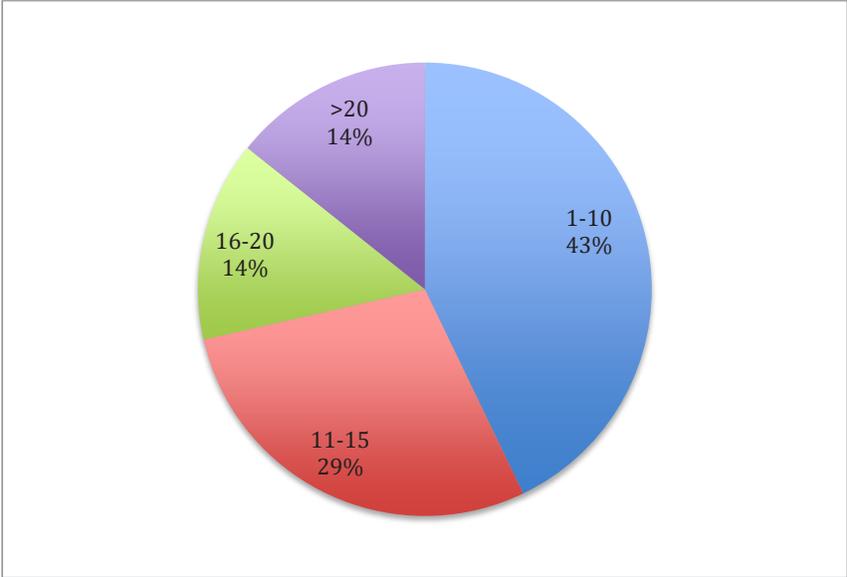

Figure 5.7: ER Holding rooms

Regarding the number of counseling rooms provided in outpatient facilities, only 5% had five rooms or fewer, while 26% had more than 20 rooms. (See Figure 5.8.) We were unable to find data on the number of holding rooms in national and international distributions.
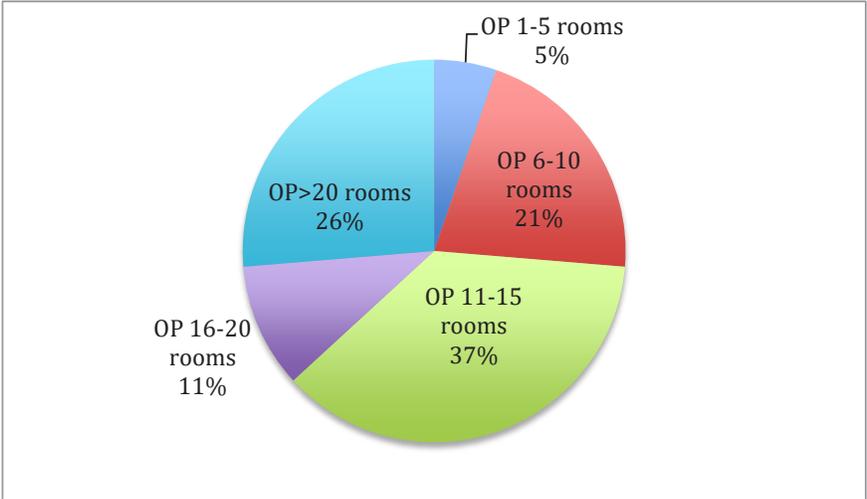

Figure 5.8: Outpatient counseling rooms

We also compared the length of stay in our population with national demographics. Almost 50% of the respondents in this study reported that a length of stay that was less than seven days. (See Figure 5.9.) This is similar to the average length of stay for all mental disorders treated in hospital inpatient care, as reported by the Centers for Disease Control and Prevention (2015), which is 7.2 days. In Australia in 2013-14, according to the Australian Institute of Health and Welfare (2015) the national ALOS for public acute hospitals was much longer: 16 days.
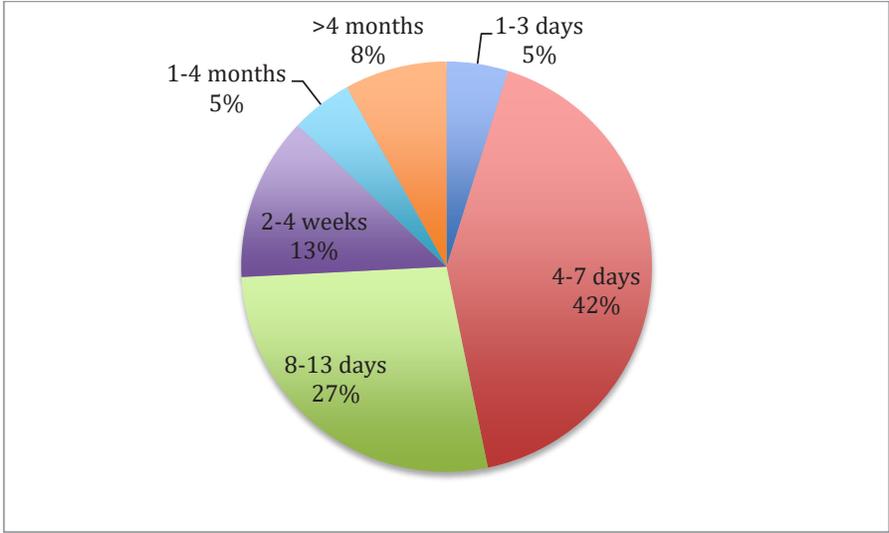
Figure 5.9: Average length of stay, inpatient facility

The average facility in our study has 10 to 50 beds. (See Figure 5.10.) This is congruent with the US national average of 23.6 inpatient beds per 100,000 people—as reported by the World Health Organization and presented in its 2015 Mental Health Atlas profile. Globally, that atlas shows that the median number of mental health beds per 100,000 is approximately 50 in all high-income countries. Our findings fit with the international data.
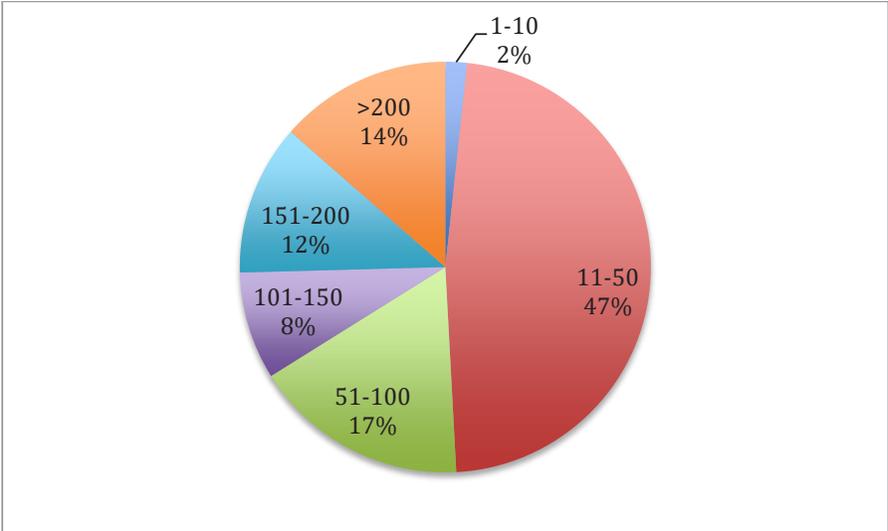

Figure 5.10: Average number of beds, inpatient facility

Within that average of 10 to 50 beds, 70% of units in this study had 15 to 25 beds. (See Figure 5.11.) There is no database to indicate the typical number of beds per individual unit. But according to WHO's 2015 Mental Health Atlas, the number of psychiatric beds in total in high-income countries is 11.47 per 100,000. The US profile is very slightly higher: 11.5 beds per 100,000 population.
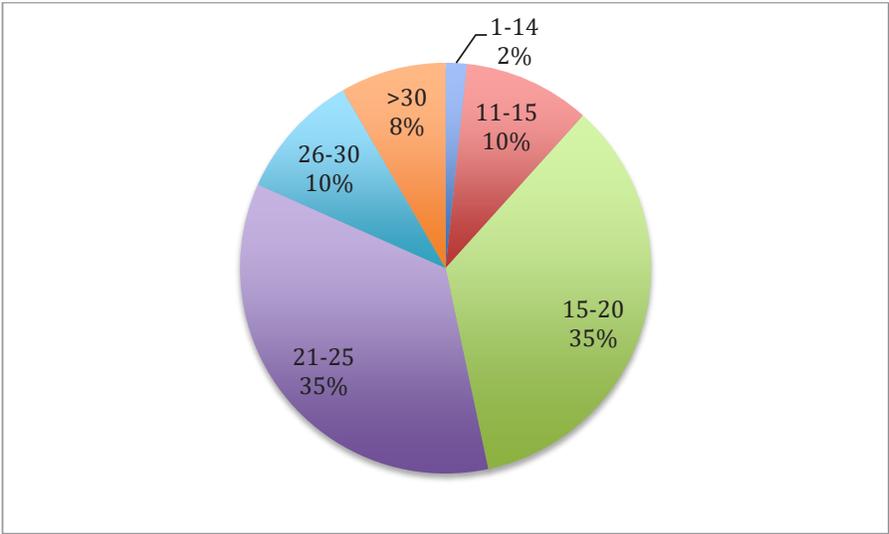

Figure 5.11: Average number of beds, inpatient unit

5.3.3. All Respondents

This study evaluated facilities by separating their characteristics into questions about general categories (i.e., deinstitutionalized/ homelike environment features, an orderly and organized environment, well-maintained environment, access to nature, attractive and aesthetically pleasing). It did the same with more specific environmental features (security, noise, day lighting, furniture, lighting, staff respite space, etc.).

Of all these categories, a well-maintained environment was perceived to be most important. This was followed by, in no particular order, access to nature, attractiveness and aesthetics, a deinstitutionalized environment, and orderliness and organization. All of these characteristics were perceived to be important; but the difference between the first one (maintenance) and the last one (attractiveness and aesthetics) was the only difference that was statistically significant (p<.05).

Conversely, all of these characteristics were perceived as being neither effective nor ineffective (4.22 to 4.98). The only significant difference between the effectiveness scores of these categories is between the top-ranked category (well-maintained environment) and the lowest- and second-lowest-ranked categories (visual/physical access to the outdoors and deinstitutionalized environment, respectively) (p<.05).

One of the important conclusions of the study is that there is a statistically significant difference between the perceived importance of a feature or characteristic and the perceived effectiveness of it (p<.001). This suggests a gap between what psychiatric nursing staffers believe is important and what they have to work with. (See Figure 5.12.) In the five categories that nurses ranked as most therapeutic, their facilities, they said, fell short on every one.
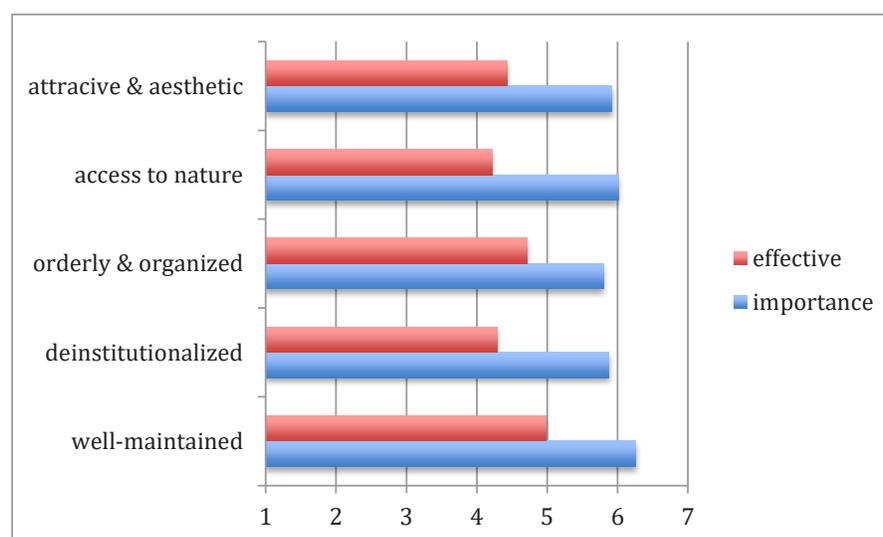
Figure 5.12: Importance and effectiveness of broad environmental features

sig dif importance well maintained and orderly p<.05
sig dif effectiveness well maintained and orderly and well maintained and outdoors p<.05
sig dif effectiveness vs. importance for all factors p<.001

5.3.3.1 Deinstitutionalized & Homelike Environment

According to survey respondents, the most highly ranked contributors to a deinstitutionalized and homelike environment are: a sense of respect among patients and staff members, patients' senses of choice and control over their inpatient visit (and by extension, their lives), and a welcoming entry procedure. And yet, while these features seem important intuitively, only a few were statistically different. (See Figure 5.13.)
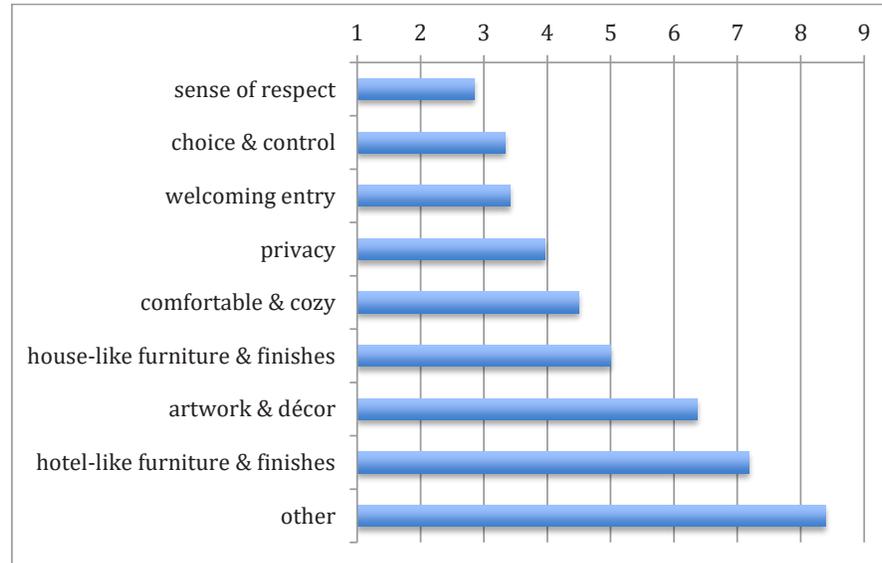

Figure 5.13: Importance of environmental features in achieving a deinstitutionalized and homelike environment

The Fountain House living Room - NewYork City

5.3.3.2 Organized and Orderly Environment

The absence of clutter in an environment that is navigable and readable contributes to an organized and orderly environment, according to respondents. Other attributes of an organized and orderly environment were compared and analyzed, and the relationships among them were significantly different: absence of clutter and all equipment having a designated storage area (p<.001), navigable
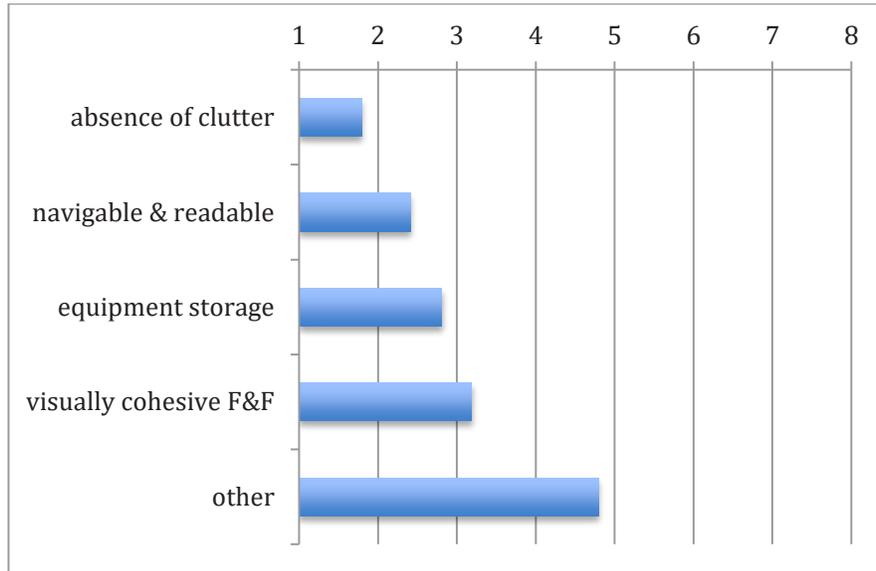
Figure 5.14: Importance of environmental features in achieving an organized and orderly environment

and readable space arrangement and visually cohesive or matching furniture and finishes (p<.05), and visually cohesive or matching furniture and furnishings and "other" (p<.001).

5.3.3.3 Well-Maintained Environment

The most highly ranked contributors to a well-maintained environment were clean floors, walls and finishes, and mechanical systems that operate well. While these features seem important, intuitively, only a few were statistically different, such as: clean floors, walls, and other surfaces and furniture and finishes in good condition (p<.05), properly operating electrical fixtures and heating and cooling systems and "other" (p<.001), furniture and finishes in good condition and "other" (p<.001), and properly operating equipment and "other" (p<.001).
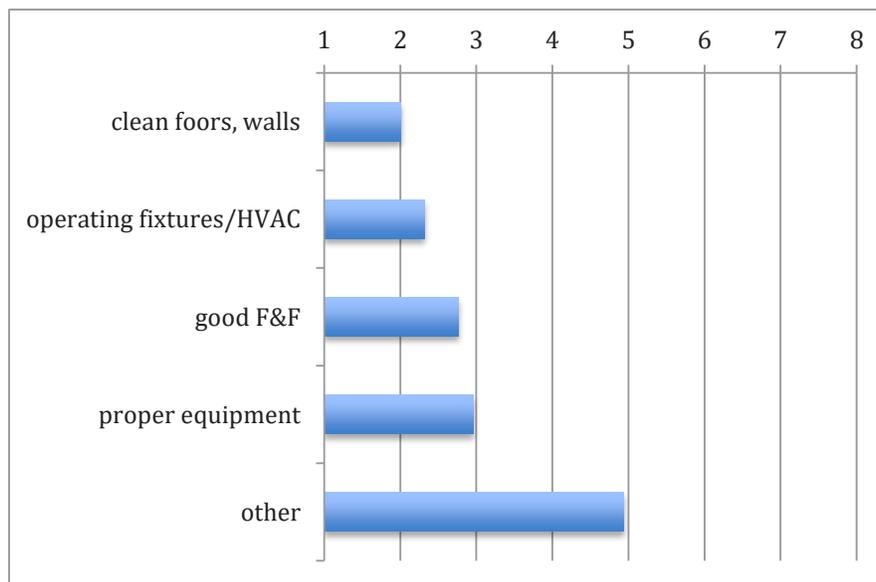

Figure 5.15: Importance of environmental features in achieving a well-maintained environment

5.3.3.4 Views of Nature

According to survey respondents, views of gardens and views of natural landscapes were the most highly ranked contributors to achieving visual access to nature. Among all the responses, only a few were statistically different.
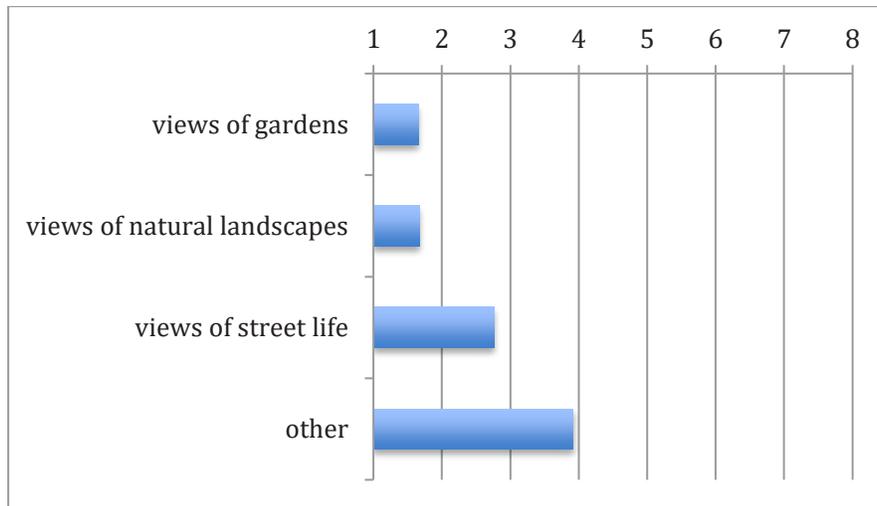

Figure 5.16: Importance of environmental features in achieving visual access to nature

5.3.3.5 Access to Outdoors

According to survey respondents, outdoor safety and private conversation spaces were the most highly ranked contributors to creating an accessible outdoor environment. While these features seem important, intuitively, only a few responses were statistically different from one another.
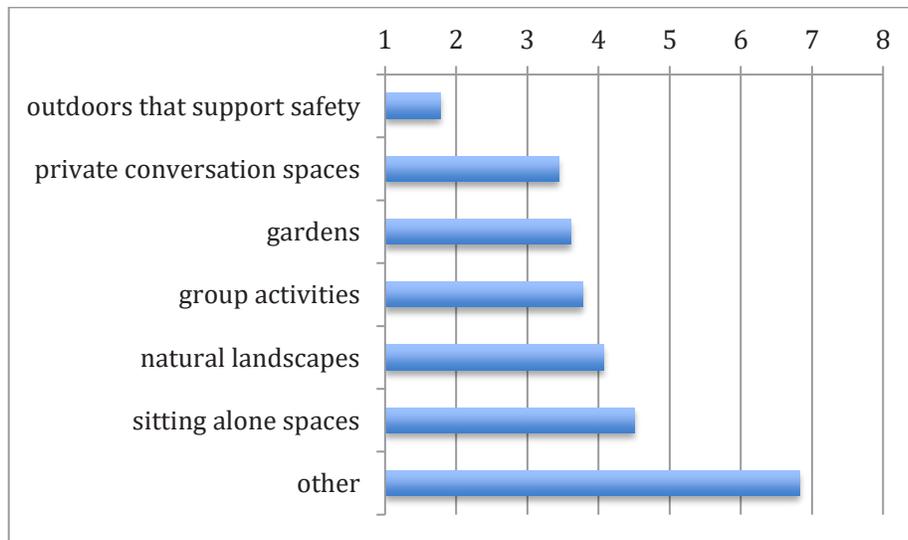

Figure 5.17: Importance of environmental features in achieving direct access to the outdoors

5.3.4. Specific Environmental Features

Specific environmental features of facilities were explored and ranked in order of their importance to staffers (See Figure 5.18.) Many of the relationships between categories were statistically significant.

The pattern reflects much of what we know about expression of staff needs. While staffers are concerned about their personal safety, they often place their desire for personal amenities (such as respite space) below the priority they place on patient needs (Shepley, 2012).

1. Staff Safety/Security
2. Noise Control
3. Good Day Lighting
4. Comfortable Furniture
5. Good Electric Lighting
6. Damage-Resistant Furniture
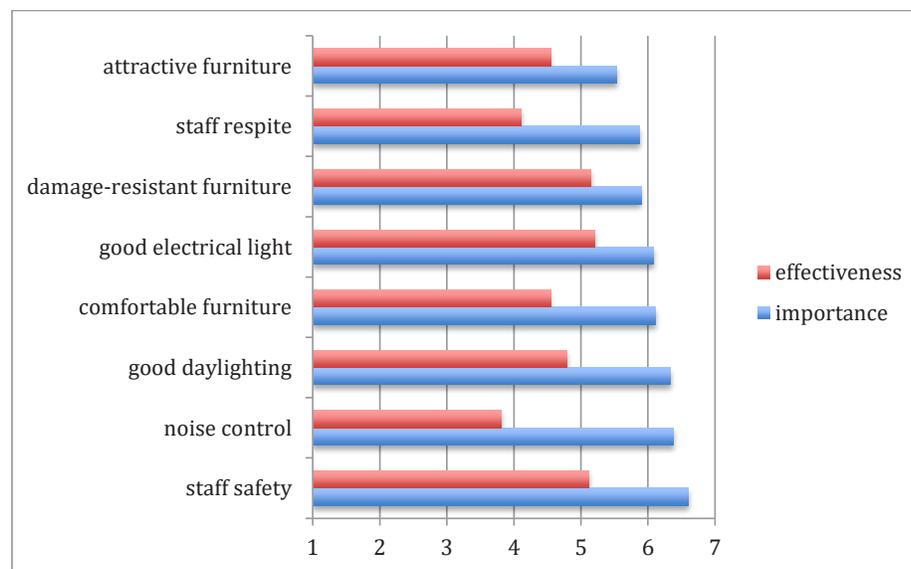7. Attractive Furniture
8. Staff Respite Space

Figure 5.18: Relative rankings of specific environmental features

Sig dif importance staff respite and attractive furniture (p<.05)
Sig dif effectiveness staff safety/security and comfortable furniture (p<.001)
Sig dif effectiveness noise control and damage-resistant furniture (p<.05)
Sig dif effectiveness good day lighting and attractive furniture (p<.001)
Sig dif effectiveness comfortable furniture and attractive furniture (p<.001)
Sig dif effectiveness good electric lighting and attractive furniture (p<.05)
Sig dif effectiveness vs. importance for all factors (p<.001)

5.3.4.1. Staff Safety and Security

Staff safety and security was the highest priority for staffers who were among the respondents to this questionnaire. Psychiatric nurses have some of the highest occurrence of nonfatal workplace violence and assault in healthcare settings (Lanza et al., 2006, Winstanley & Whittington, 2004) because psychiatric patients have been known to become physically aggressive. Staffers experience significant stress around the potential for violence, especially when patients are larger and stronger than they are (Hallman, O'Connor, Hasenau & Brady, 2010; Hatch-Maillette & Scalora, 2001).

5.3.4.2. Noise Control

Noise control was the second most important environmental category. Noise control and good lighting are critical features in research of other healthcare settings. In a recent study, for example, Cunha and Silva (2015) found that patients perceive noise as having a negative impact on their well-being. Unfortunately, noise has not been explored in a focused way in psychiatric facilities. It is interesting to note that noise control is one of the categories that staffers thought was only minimally effective in the facilities where they work.

5.3.4.3. Good Day Lighting

Daylight has been identified as an important environmental feature of healthcare settings. However, its effectiveness in behavioral and mental health facilities had not been explored in isolation. Access to daylight was bundled together with other features to create a package of variables that contribute to decreased aggression in a psychiatric facility (Ulrich, et al., 2012). Daylight has been associated with a reduced length of stay in other types of healthcare residential facilities (Alzoubi & Bataineh, 2010).

5.3.4.4. Comfortable Furniture

Comfortable furniture can be defined as furniture that supports relaxation (i.e., appropriately soft) and ergonometrically appropriate for the specific population of children, adults or seniors. The notion of a homelike environment is challenging, of course, as the ambience of homes varies. Providing furniture that satisfied the criteria of 'homelike,' and is simultaneously sturdy and damage-resistant, is a challenge. Several authors (e.g., Cummings, Grandfield & Coldwell, 2010) propose ways to do this.

5.3.4.5. Good Electric Lighting

Appropriate electrical lighting is associated with three objectives: the need to support functional tasks (e.g., medication distribution); the need for enhanced safety (Peek-Asa et al., 2009); and the desire to use lighting to create a pleasant environment (Karlin & Zeiss, 2006). These last two objectives, as with many environmental features, is closely associated with other categories, such as ensuring safety and creating a homelike environment.

5.3.4.6. Damage-Resistant Furniture

The need for damage-resistant furniture is clear. Damaged furniture and furnishings undermine the visual quality of an environment, the furniture might be unsafe, and it could, incidentally, be used to store contraband. Damage-resistant furniture sometimes implies furniture that cannot be lifted and thrown or broken into sharp pieces.

5.3.4.7. Staff Respite Space

Recent studies strongly indicate the importance of nurse respite areas in hospitals (Nejati, Rodiek & Shepley, 2015; Nejati, Shepley, & Rodiek, in press; Nejati, Shepley, Rodiek, Lee & Varni, 2016). The topic has not been addressed specifically in psychiatric facilities. As mentioned previously, the lack of this feature in may facilities may be the result of placing patient needs above those of staff.

5.3.4.8. Attractive Furniture

Although this feature was among the least important in the study, it was still considered to be important. Damage-resistant furniture that is also attractive is valued, and in an environment with so little visual stimulation, the appearance of furniture and furnishings that are pleasing to the eye can be considered a design feature akin to visual art.

5.3.4.9. Proximity to a General Hospital

According to the U.S. Department of Health and Human Services' Office of the Inspector General, there were 611 free-standing psychiatric hospitals in the United States in 2000. Of the approximately 6,000 acute care hospitals in the country, some 25% operate inpatient psychiatric units. One of the issues raised during the interviews was about the location of psychiatric facilities that are not adjacent to general hospitals.   Fifty-three percent of respondents work at facilities that are adjacent to or component parts of a general hospital, and ranked this location as important but not dramatically so (4.32 out of 7).

5.3.4.10. Moderating Variables: Job Title, Surroundings, Time in Field

Respondents' job titles were not related to the importance they placed on the various environmental variables investigated in this study, but what role a person plays within a psychiatric facility is important in evaluating the effectiveness of those variables. (See Figures 5.17 and 5.18). This means that a staff member's job (e.g., psychiatric nurse, psychiatric nurse practitioner, psychiatric social worker) did not influence the value the individual placed on the importance of the primary variable cluster. However, job title was related to perceived effectiveness.

In addition, surroundings such as rural, suburban, or urban were not related to the importance or effectiveness of quality landscaping. The researchers hypothesized that staff from urban facilities would view quality landscaping

differently than staff from facilities in rural environments, in terms of importance and effectiveness, but this was not the case.

Staffers' time in the field was related to the importance they placed on attractive and well-maintained environments. This confirmed the researchers' hypothesis that time in the field would either influence staffers to become blinded to the shortcomings of the environment or else, conversely, that it leave them more frustrated by these inadequacies.

Demographic variable	Measure	Environmental variable	Signif
job title	importance	deinstitutional	n.s.
		orderly & organized	n.s
		attractive & aesthetic	n.s.
		well-maintained	n.s.
		access to nature	n.s.
surroundings (i.e., rural)	importance	quality landscaping	n.s.
	effectiveness	quality landscaping	n.s.

Figure 5. 19: Insignificant relationships associated with demographic variables (Chi-Square)

Demographic variable	Measure	Environmental variable	Signif
job title	effectiveness	deinstitutional	$P = .05$
		attractive & aesthetic	$P = .05$
		quality landscaping	$P = .001$
		access to outdoors	$P = .001$
time in field	importance	attractive & aesthetic	$P = .001$
		well-maintained	$P = .05$

Figure 5. 20: Significant relationships associated with demographic variables (Chi-Square)

5.3.4.11. Additional Comments

One of the themes found in the additional comments left by respondents was to include staff input in the planning and design process of new facilities. Multiple authors have reinforced this concept. Perkins (2013) notes:

> *Experience has shown that staff and patients at healthcare facilities often have unique and well-informed knowledge about their local environment, their behavioural preferences and their needs. Astute designers realize that an informed client is more willing to respect the challenges and constraints of what can be done, and once this understanding is in place, more willing to trust the expertise of the designer. (Perkins, 2013, p. 388).*

Other topics found in the additional comments reiterated responses addressed in the questionnaire, including: providing adequate day lighting, access to nature (either visually or physically), staff respite space, and designing flexible spaces that can accommodate the unique needs of a variety of patient populations.

5.3.5. Inpatient Survey Questions

5.3.5.1. Private Patient Bedrooms and Baths

The mean score for the importance of private patient bedrooms was 5.84 (SD =.954), and the mean importance score for private patient bathrooms was 5.82 (SD = 1.066). The standard deviations are limited, suggesting a consolidated position on the importance of this feature. The majority of units (approximate 60%) have fewer than 50% private room and fewer than 50% private bathrooms. (See Figure 5.21.)

This topic is the most contentious of all those addressed in both the interviews and the survey. As discussed in Section 2.8, multiple authors recommend providing private patient bedrooms (Forster, Cavness, & Phelps, 1999; Lynch, Plant, & Ryan, 2005; Martin, 1995; Salerno, et al., 2012), or lower-density patient rooms, such as large two-person bedrooms (Wolfe, 1975; Wilson, et al., 1992; Turlington, 2004; Izumi, 1968; Chou, et al., 2002; Ulrich, et al., 2012). However, two interviewees disagreed with providing private rooms for reasons of suicide prevention.
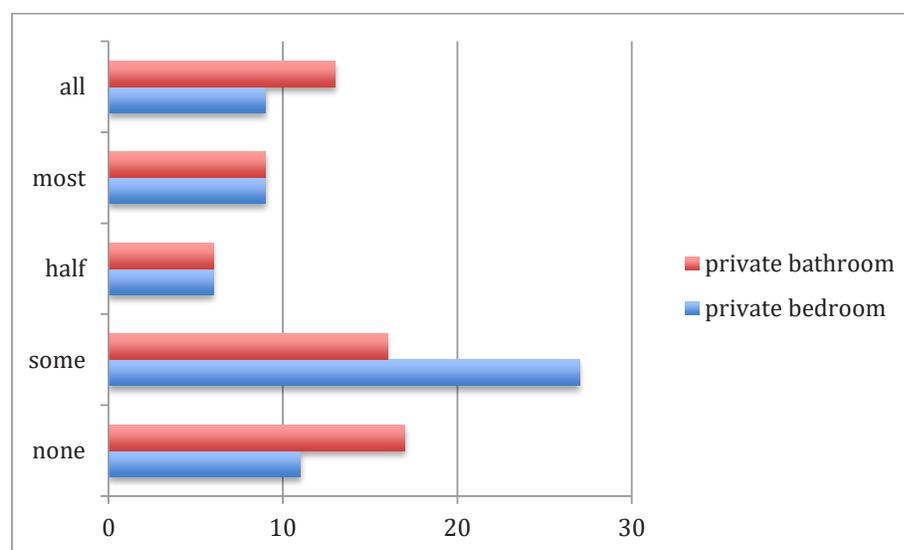

Figure 5.21: Proportion of private bedrooms and private bathrooms

5.3.5.2. Staff-Patient Interaction/Patient Observation

With regard to staff-patient interaction and patient observation, one-on-one consulting rooms were considered to be most important and most effective, followed by monitoring through a window and, lastly, the benefits of open nurse stations. Video monitoring was considered less important and less effective. Closed nurse stations and audio monitoring were considered unimportant and ineffective. (See Figure 5.22.)
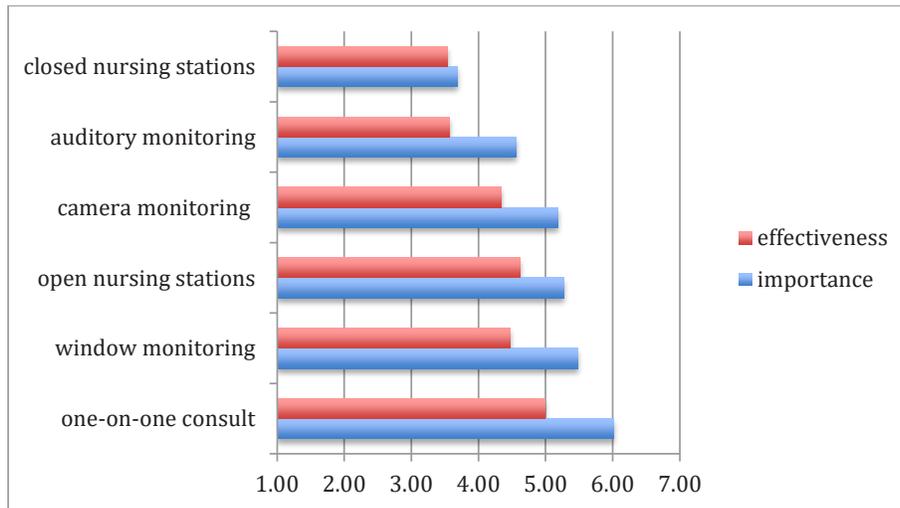
Figure 5.22: Staff-patient interaction and patient observation effectiveness and importance

Sig dif importance one-on-one consultation and monitoring via camera (p<.05)
Sig dif importance monitoring via video monitoring (p<.05)
Sig dif importance monitoring via camera and closed nursing stations (p<.001).
Sig dif effectiveness consulting and auditory monitoring (p<.001)
Sig dif effectiveness consulting and closed nursing stations (p<.001).
Sig dif effectiveness open nursing stations and auditory monitoring (p<.05)
Sig dif open nurse stations and closed nursing stations (p<.05).
Sig dif importance versus effectiveness all categories except closed nursing station (p<.05 to p<.001)

5.3.5.3. Positive Distraction

It is noteworthy that positive distraction was found to be almost as important a feature as suicide resistance. This may be because positive distraction has the capacity to redirect suicidal ideation. Staff respite space is something that appears to be very important to staffers but only minimally incorporated in facilities. The relative importance of suicide resistance, autonomy and spontaneity, social interaction, staff respite, and positive distraction are discussed below. (See Figure 5.23.)
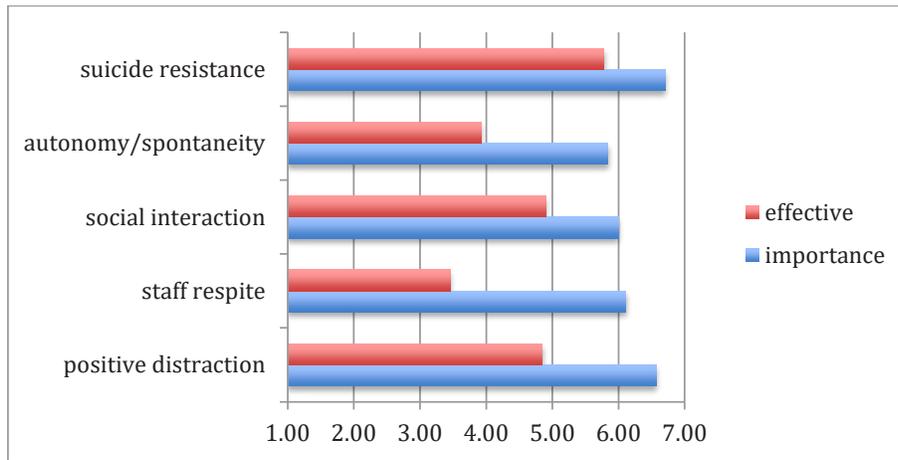

Source: https://pixabay.com/en/girl-read-reading-newspaper-791231/

Figure 5.23: Positive distraction effectiveness and importance

Sig dif importance positive distraction and staff respite (p<.05)
Sig dif importance positive distraction and social interaction/community (p<.001)
Sig dif importance positive distraction and autonomy and spontaneity (p<.001)
Sig dif effectiveness positive distraction and autonomy spontaneity (p<.05)
Sig dif effectiveness positive distraction and staff respite scores (p<.001)
Sig dif effectiveness suicide resistance scores and positive distraction (p<.05)
Sig dif importance and effectiveness for positive distractions (p<.001)

Nanda, Eisen, Zadeh, and Owen (2011) introduced art in a psychiatric patient lounge and found that on days when art depicting restorative nature was provided, patient requested less anxiety medication—an indication that this positive distraction helped lower patient anxiety and agitation.

There are many kinds of positive distraction, but subjects primarily identified music, board games (most important), and video games (least important). (apart from 'other' types of positive distraction). Other items, including books and magazines, television, sports and recreation, pet therapy, and exercise equipment, received average rankings. (See Figure 5.24.)
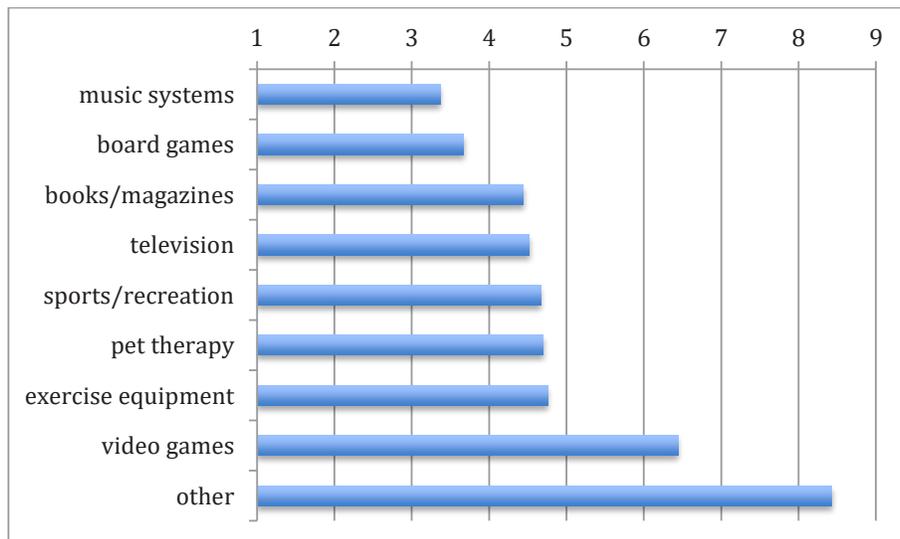

Figure 5.24: Importance of environmental features in achieving positive distraction

5.3.5.4. Social Interaction and Community

Group activities, communal eating, and group therapy are said to be the primary contributors to social interaction and community. (See Figure 5.25.)
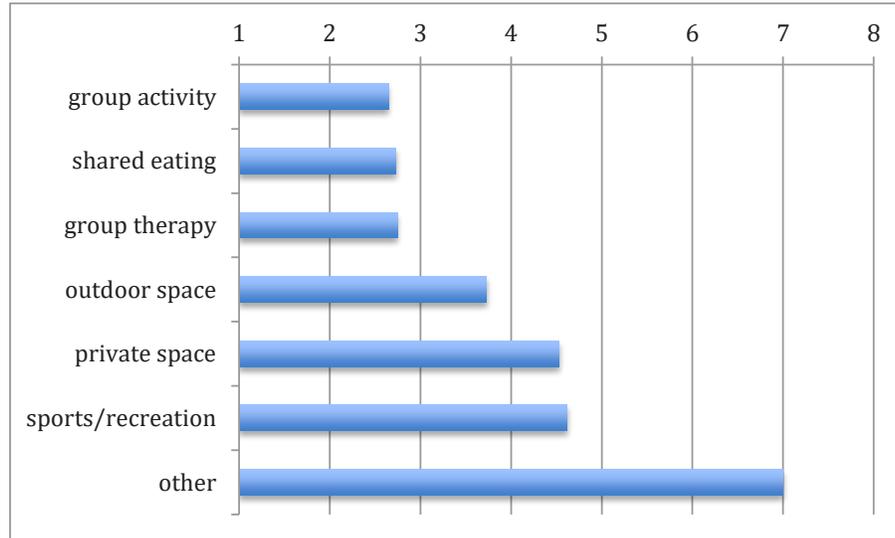

Figure 5.25: Importance of environmental features to achieving social interaction and community

5.3.5.5. Staff Respite

The primary contributors to staff respite space are outdoor space and a private staff entrance. (Figure 5.26.) There was little support for a staff nap room, which may be noteworthy because by nurses in standard hospitals have embraced this feature (Nejati, Shepley & Rodiek, 2016). The desire for outdoor space reflects one of the most significant trends in creating healing environments for all—patients, staff, and families (Cooper Marcus & Sachs, 2013).
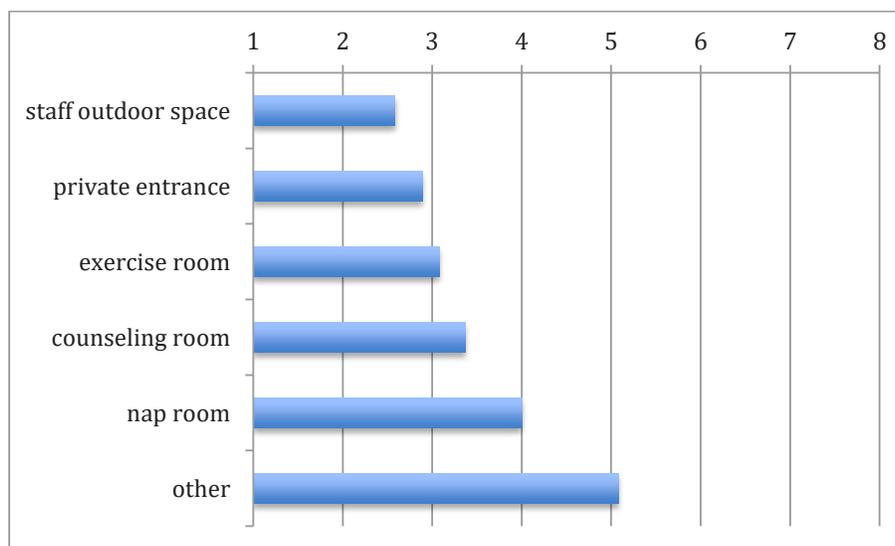

Figure 5.26: Importance of environmental features in achieving staff respite

5.3.5.6. Autonomy and Spontaneity

Staffers noted that the primary contributor to patient autonomy and spontaneity was patients' feelings of security. (See Figure 5.27.) The ability to explore is based on feelings of safety and security. Other features—technology, access to the outdoors, access to exercise equipment, and access to snacks—were all rated nearly equal in importance one to another.
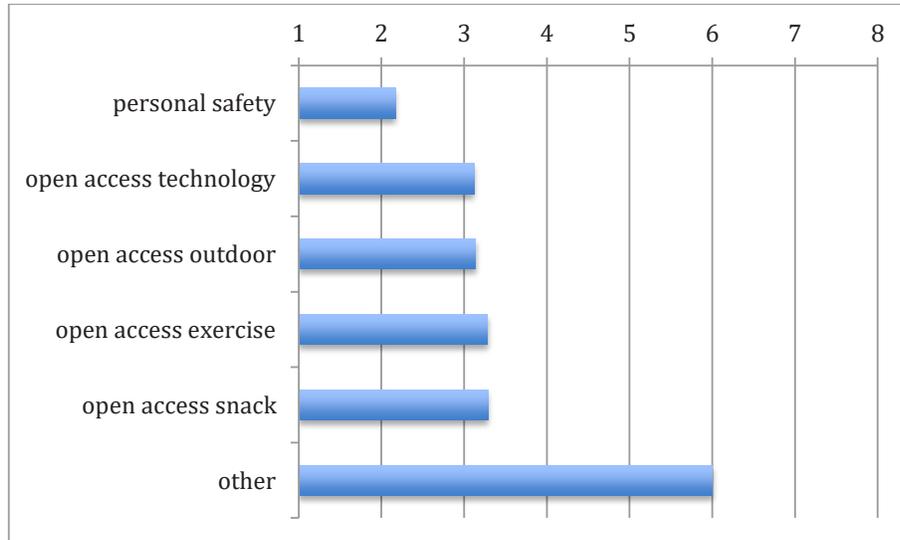
Figure 5.27: Importance of environmental features in achieving autonomy and spontaneity

5.3.5.7. Suicide Resistance

Anti-ligature devices (furniture, hardware, and bathroom fixtures) emerged as the most important environmental contributor to suicide-resistance. (See Figure 5.28.) Shared bedrooms and shared bathrooms were thought by most to contribute to suicide resistance, although two interviewees disagreed with this opinion.

Figure 5.28: Importance of environmental features in resisting suicides

5.3.5.8. Specific Environmental Features
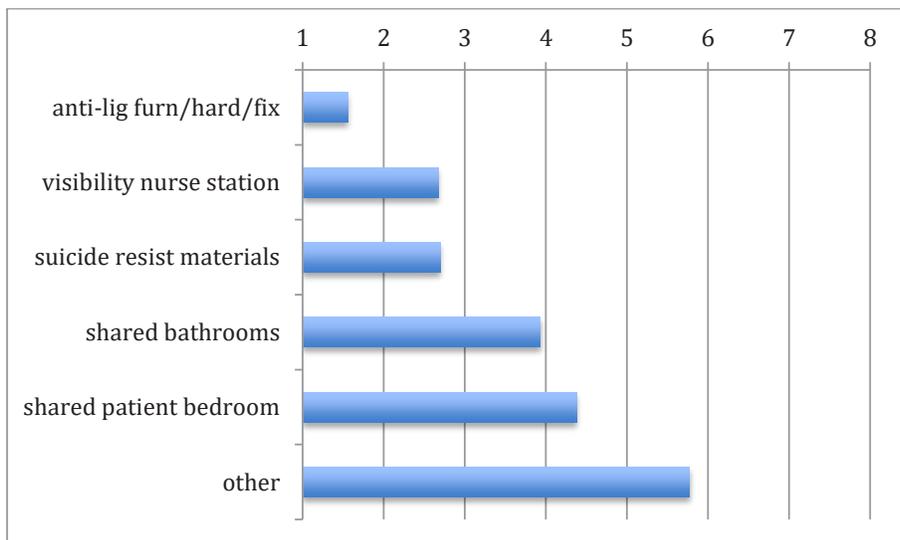
Additional environmental features were addressed, including therapeutic activities, private areas, and the configuration of nurse stations. (See Figure 5.29.) Designated smoking areas were not considered to be either important or effective.
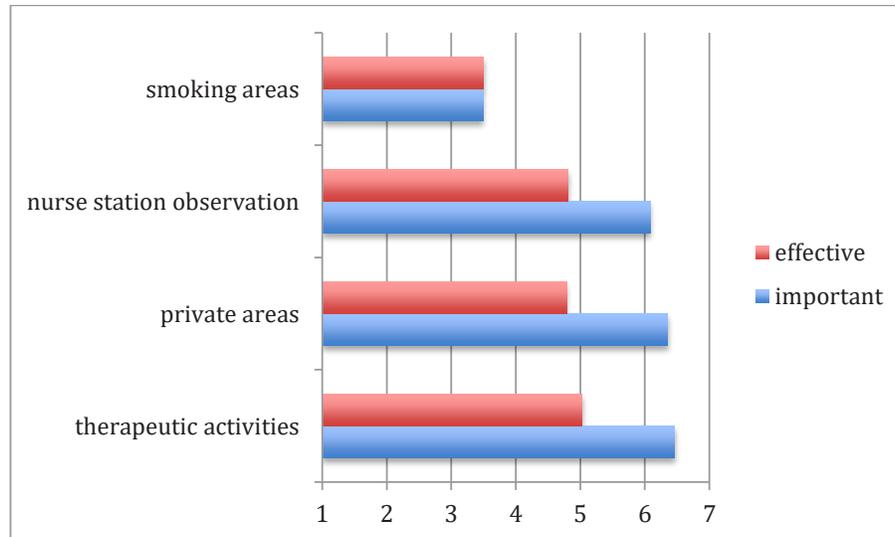
Figure 5.29: Importance of a variety of environmental features

5.3.5.9. Moderating Variables: Private Bedrooms and the Size of a Mental Health Unit

Staffers from facilities with private patient rooms feel that this privacy is important and recommend private bedrooms (p<.05). The number of beds in a mental health unit was significantly related to the importance scores of open nurse stations (p<.05). Finally, unit size was thought to be important (6.13 on a scale of 7.00). The recommended size of a unit (according to 75% of respondents) is 11 to 20 beds.
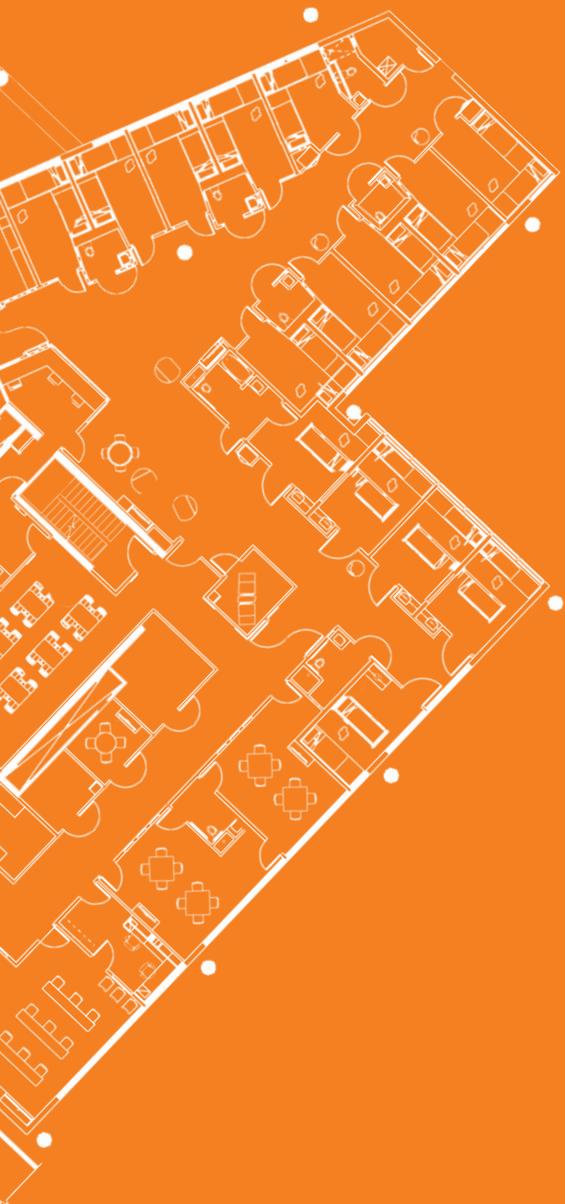
6.CONCLUSION

6. CONCLUSION

6.1. Study limitations

As with most studies, there are limitations to this research. The most significant of these is the number of respondents. A larger number of responses is needed. Unfortunately, access to psychiatric staffers is difficult: most organizations limit contact with their personnel to email newsletters. The researchers have approached the Veterans Administration about a collaboration and may seek funding in the future to expand the project by including them.

A second limitation of the research is the focus on staff, to the exclusion of patients. As mentioned in the Introduction, it is difficult to gain access to patient populations: organizations that provide healthcare protect individuals from unnecessary intrusion. In the entire field of healthcare, this may be the most difficult patient population to access.

A third limitation was the exclusive focus on MBH facilities in English-speaking Western cultures: United States, United Kingdom, Australia, and Canada. Other cultures may have other needs and priorities. Lastly, the study's initial questions were based on the literature of the field, which is limited and rarely engages experimental, quasi-experimental, or highly structured qualitative methods.

6.2. Design Guidelines

This study consisted of a literature review, interviews, focus group, and a survey. A vast amount of information is provided which serves as a foundation for future research studies and design guidelines. However, in the absence of existing evidence-based recommendations, several design topics are worth considering based on design objectives. Focusing on the primary factors that were discussed in the interviews and survey, potential topics are:

- attractive and aesthetically pleasing decor
- deinstitutionalized appearance
- features that ensure patient safety
- features that ensure staff safety
- high levels of maintenance
- orderly and organized furniture, storage, and configuration
- presence of positive distractions
- spaces dedicated to staff respite
- visual and physical access to the outdoors

Recommended means of accomplishing these objectives are provided in Chapter 5 under the "Discussion," which includes a list of priorities.

In spite of the support in interviews and the survey for private rooms and open nurse stations, no recommendation on these design elements is being made at this time. These two design elements are highly significant in terms of both staff and patient safety. For this reason, they must be researched thoroughly. A

conservative approach in both cases would be to provide hybrid designs. We can recommend this: In the case of private rooms, provide both private and semi-private rooms and some larger private rooms that could be converted to shared rooms. In the case of nurse stations, provide a semi-open station that has the flexibility to be fully open with minor remodeling. Not all patients have identical needs—indeed, units usually accommodate a mix of diagnoses at the same time—so flexibility is a key to good design.

6.3.   The Psychiatric Staff Environmental Design (PSED) Research Tool

The usefulness of the PSED was corroborated by the high level of importance associated with each of the research questions. The only one of the questions that received a rating of low importance was about cigarette smoking. This issue is being addressed by other means in inpatient facilities, with the use of nicotine patches, for example. Other minor modifications to the research tool include requesting more specific information about numbers of rooms, etc., and re-clustering specific topic areas.

6.4.   Quality of Existing Facilities

One of the clearest findings of this study is the significant disparity between the design goals that MBH staffers believe are important for patients, their families, and staffers and the frequency with which these features are adequately provided in the environments where they currently work. Impediments to achieving these design goals include fiscal limitations, stigmatization of mental health patients, and lack of research to support design objectives.

6.5   Future research

Some members of the research team expressed concern that facility design in our society is more strongly driven by code compliance and fear of lawsuit than it is attentive to patient comfort and the fear that often characterizes mental illness. In addition, concern for injury to patients or staffers results in conflating behavioral health design with prison design, with an emphasis on anti-vandalism. Future research is needed to distinguish these two populations and to create a design ethos unique to mental health facilities.

The study's literature review, interviews, focus group, and survey identified prime areas for future research on mental and behavioral health facilities. Our recommendation in terms of priority is for studies on:

1. private versus shared bedrooms
2. open versus closed nurse stations
3. noise and acoustics
4. access to nature
5. positive distraction
6. lighting
7. staff respite areas

The most urgent of these topics are the impacts of private versus shared bedrooms and nurse station design. Patient and staff safety put these features at the top of the list. In the case of bedroom design, the concern is the impact that design may have on aggression and suicide attempts. In the case of the openness of nurse stations, the issue is, again, the frequency of undesirable patient behaviors, plus patients' and staffers' senses of security.

The objectives of this research project were met. The objectives were as follows: to create a tool for evaluating MBH facilities, identify design goals, evaluate the quality of existing facilities, and make recommendations for future research. These findings are an initial step toward focusing attention on mental and behavioral settings, and we hope that the content will inspire and inform future designers and researchers.
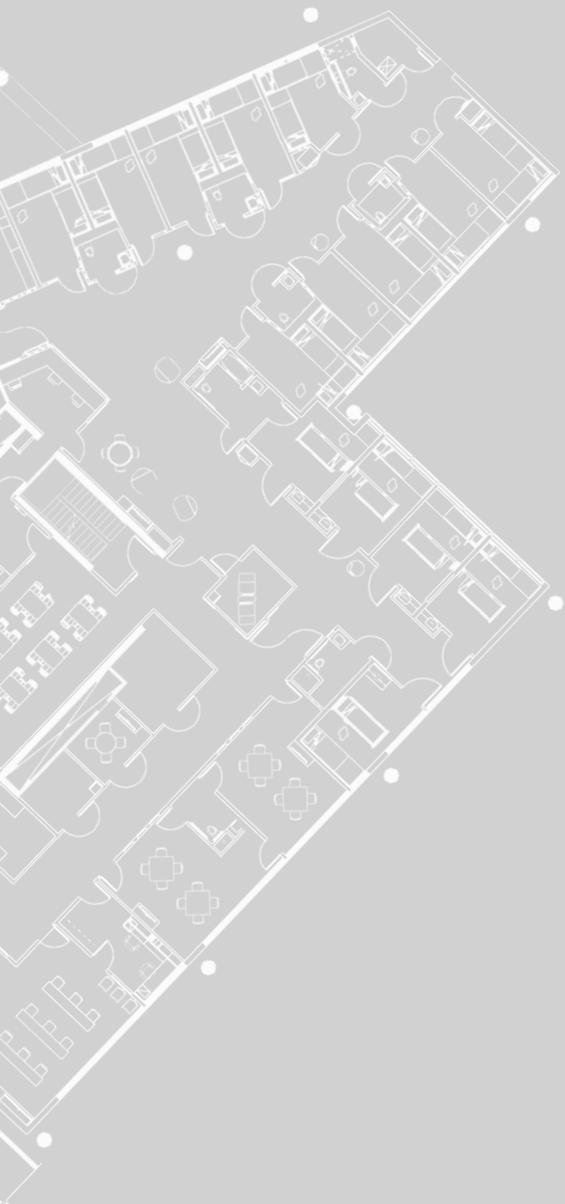
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