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EFFECTIVE DESIGN FEATURES FOR THE MANAGEMENT OF BEHAVIORAL HEALTH PATIENTS IN GENERAL EMERGENCY DEPARTMENTS OF HOSPITALS

By

RHEENA W. LUCHANSKY, Bachelor of Science in Bioengineering,
Bachelor of Arts in Architectural Studies

Submitted to the Faculty of the Graduate School of

Stephen F. Austin State University

In Partial Fulfillment

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RHEENA W. LUCHANSKY, Bachelor of Science in Bioengineering,
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APPROVED:

Dr. Mitzi R. Perritt, Thesis Director

Dr. Ray L. Darville, Committee Member

Dr. Karen Migl, Committee Member

Ms. Annabella Koloskov, Committee Member

Dr. Pauline M. Sampson
Dean of Research and Graduate Studies

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ABSTRACT

This study investigated nursing staff members perspectives of their existing Emergency Department (ED) and their ability to care appropriately for behavioral health patients within the environment. The study involved three rural hospitals in eastern Texas that may not always have the proper resources to care effectively for this vulnerable patient population. The researcher administered a paper-based survey utilizing a Likert-scale response system to nursing staff across all facilities and received participation from 56 respondents. Survey questions were designed to investigate the current ED environment and identify design features available to assist with caring for behavioral health patients. Data gathered revealed staff members' preference for enhanced security within the ED in addition to designated treatment area(s) to help better manage the behavioral health population treated at their facilities.

DEDICATION

To those who loved me at my worst, encouraged me at my best, showed me by example how to give grace, and reminded me that I am not in control, this is for you.

Now on to our next adventure…

ACKNOWLEDGEMENTS

The completion of this work would not have been possible without the participation and assistance of multiple groups of people, many whose names may not be directly captured in this work. Their contributions are truly appreciated and acknowledged with a grateful heart. Specifically, I would like to express my deep appreciation to the following:

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understand the data and what solutions exist today that could be implemented in the future state of healthcare organizations nationwide.

To the leadership team and Emergency Department staff at Woodland Heights Medical Center, Nacogdoches Memorial Hospital, and Nacogdoches Medical Center, thank you so much for your participation in this study—it would not have been possible without your complete and honest feedback.

To my husband Jon, thank you for keeping me sane and making me smile, even when I did not think it was possible. Your love and support during this process means more than you know.

To my family, friends, and co-workers, thank you for allowing me to step back from some parts of “life” to step toward my goals. It means the world to me, and suffice it to say, I am coming back with a new lens through which to look.

Above all, I would like to thank God, my life on Earth, and the ways in which He has shaped me to love well and further His purpose. I am thankful for the opportunity to complete this thesis and look forward to whatever He has next for me.

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CHAPTER 1

Introduction

Mental illness historically has been viewed with suspicious uncertainty throughout the globe. These sentiments have generated stigma and prejudicial actions toward individuals with this disposition. As a result of these behaviors, many people with behavioral health issues have dismissed their condition so as not to be identified as a societal outlier. Due to increased awareness of mental health problems over the past decade in the United States, the stigma surrounding behavioral health has started to decrease (Oelrich, 2017). As treatment of these conditions has become more prevalent, the need for healthcare organizations to be able to treat a more varied patient type has also emerged. Facilities must now balance the safety of patients, staff, and visitors with a healing environment that treats an even more vulnerable population (Black, 2017). According to the American Psychological Association, today “57% of all adults believe that people are caring and sympathetic to persons with mental illness” (Data on behavioral health in the United States, n.d., para. 22). In addition, 78% of adults with mental health symptoms and 89% of adults without mental health symptoms agree that people with mental illness can lead normal

and productive lives upon receipt of treatment appropriate for their condition (Data on behavioral health in the United States, n.d.).

Statement of the Problem

The statistics on behavioral health in the United States are unsettling.

- One in five Americans suffer from a mental illness (Dzubak, 2017).
- Nearly 50% of U.S. adults will develop at least one mental illness during their lifetime (Data on behavioral health in the United States, n.d.).
- A reported 45.1 million adults had a mental illness in the past year with 11 million of these being serious and requiring acute treatment (Data on behavioral health in the United States, n.d.).
- Approximately 25% of all adult community hospital admissions in the United States involve depressive, schizophrenia, bipolar, or other mental health or substance use-related disorders (Data on behavioral health in the United States, n.d.).
- In 2014, the rate of mortalities per 100,000 population that resulted from mental and substance use disorders in Nacogdoches County for females and males was 11.4 and 15.1, respectively (County Profile: Nacogdoches County, Texas, 2015).
- In 2014, the suicide rate was 43% higher in a region spanning 35 counties across northeast Texas than it was statewide (Huff, 2018).

Due to several factors (e.g., insufficient community resources, uninsured patients, increases in drug use), the quantity of patients in psychiatric crisis who

are seeking treatment is on the rise. Between 1992 and 2007 (Figure 1), the proportion of mental health-related Emergency Department (ED) visits across the country has increased from 4.9% to 12.50% (Halmer & Tucci, 2016).

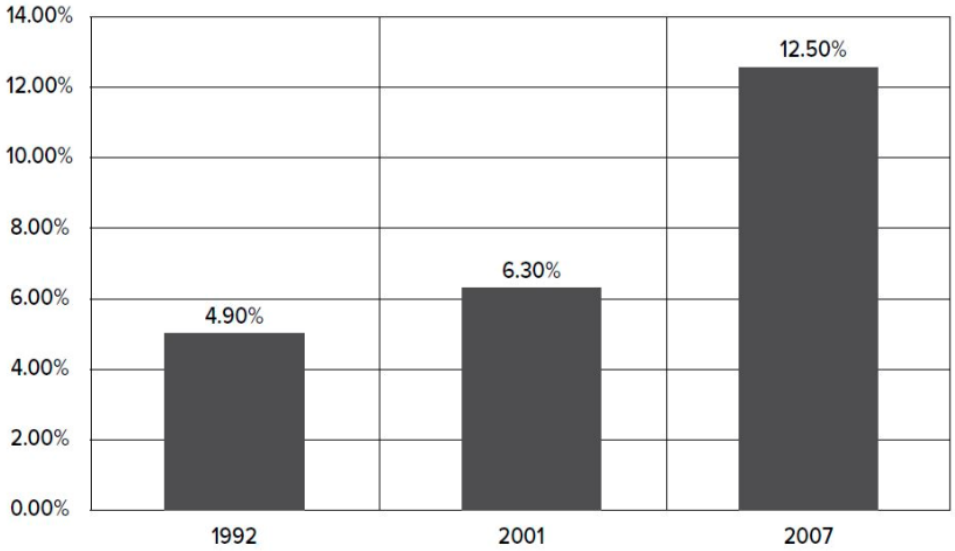

Figure 1. *Proportion of ED visits with behavioral health concerns* (Halmer & Tucci, 2016).

To address the rising need for treatment, outpatient services offered to this patient population has become more prevalent. Allowing patients to combine behavioral health treatment session with primary care visits or more readily get the help they need in the communities in which they live has helped to improve the patient experience and encourage them to seek treatment earlier before they are in a time of crisis (Black, 2017). Sadly, in many cases, the demand for behavioral health services is much greater than what is available in a community, particularly in rural environments, making it difficult for patients to understand

where they should go to receive the most effective form of treatment (Halmer & Tucci, 2016).

Provision of mental health services has shifted over the past two centuries. Mental health services were once centered around psychiatric asylums and long-term institutionalized care; however, the introduction of pharmaceutical therapies has allowed much of the care to be administered in an outpatient setting (Halmer & Tucci, 2016). As an attempt to help individuals with mental illness transition back into their communities from isolated mental health institutions, President John F. Kennedy signed the Community Mental Health Act in 1963. This Act was instrumental in creating mental health resources throughout communities nationwide through which patients in need could receive voluntary treatment (Community Mental Health Act, n.d.). Due to medicinal interventions and the impacts of the 1963 Community Mental Health Act, treatment for mental health conditions has shifted to a community-based, decentralized model of outpatient service offerings. While these methods have served as a viable solution for patients with moderate mental health conditions, the number of patients requiring more acute interventions has inundated many critical access points, causing many patients in crisis to visit emergency departments for treatment (Halmer & Tucci, 2016).

Due to limited resources for behavioral health in the community, EDs often serve as the safety net or patients go untreated. As a result, many patients in

need of behavioral health care flock to the ED for treatment. The quantity of patients throughout the United States who present to the ED has increased more than 50% since 2006 (Zeller, 2018). Of these visits, one in eight are related to mental health or substance abuse (Laderman, Dasgupta, Henderson, & Waghray, 2018). While the majority of psychiatric emergencies can be resolved within less than 24 hours if the appropriate method of intervention can be applied, in a standard ED, these methods are not easily achieved (Zeller, 2017). Due to limited knowledge on behavioral health treatment and resource shortages, many EDs are not equipped to appropriately treat psychiatric crises. In fact, patients with mental health and substance abuse listed as their chief complaint are 2.5 times more likely to be admitted than those with physical ailments. The most common forms of treatment for behavioral health patients in the ED are to refer patients to another facility with a more appropriate level of care or admit them to an inpatient treatment facility (Zeller, 2018).

Increased inpatient psychiatric admissions have generated additional demand for inpatient psychiatric beds (Dzubak, 2017). Unfortunately, the psychiatric bed supply is insufficient to meet the need with 80% of states across the nation reporting a shortage of psychiatric inpatient beds (Halmer & Tucci, 2016). The quantity of inpatient psychiatric beds dropped by 95% from 1955 to 2005, moving from 240 beds per 100,000 people to 17 beds per 100,000 people (Zeller, 2018). Because of this bed shortage, psychiatric patients awaiting

transfer or psychiatric bed placement must wait in the ED without treatment, with the average length of stay ranging anywhere from seven to 34 hours. This practice is known as psychiatric boarding (Zeller, 2018).

Behavioral health patients typically perform better in calmer settings with a trained psychiatric team (Zeller, 2017). Upon entering an ED, patients may experience a loss of control, leading to further anxiety and agitation of their condition (Dzubak, 2017) due to increased stimuli (Tavernero, 2015). The ED environment can further upset patients in crisis due to the types of activities that occur and the tendency for patients to be restricted to confined exam spaces for care (Zeller, 2017). Further, Emergency Department (ED) stays are often associated with “increased risk of symptom exacerbation or elopement” (Tavernero, 2015, para. 4).

Behavioral patients in the ED comprise a small proportion of the ED patient load; however, oftentimes these patients are high-risk and provide special circumstances for the care teams. As a result, boarding patients significantly strains operational processes and draws on ED resources including patient exam rooms and staff (Halmer & Tucci, 2016). This action often leads to ED crowding, longer wait times, and delays in care throughout the department (Zeller, 2018).

Boarding behavioral health patients in the ED is not ideal from the patient or staff perspective. Patients and the clinical staff caring for them have the right to a safe and respectful environment (Dzubak, 2017). Designing for the

behavioral health population requires collaboration between both the clinical and design teams. There are several innovative approaches that have been implemented in the past few years that integrate open layouts, collaboration spaces, and designated behavioral health sections within the ED for the management and treatment of patients (Oelrich, 2017; Zeller, 2017). Interior design research on behavioral health treatment areas has gained traction over the past few years with special emphasis on furniture, fixtures, and spatial layouts that can be used in areas that care for this vulnerable patient population (Oelrich, 2017). However, research is limited on how effective these design solutions are at managing patients, maintaining safety, and mitigating risks once implemented in the clinical environment.

While the overarching goal is to ensure all patients are able to quickly receive the appropriate level of care for their condition, there are still a number of factors that exist outside of the ED that inhibit this process from occurring for behavioral health patients (Halmer & Tucci, 2016). EDs cannot be planned or designed under the assumption that behavioral health holding will cease to exist. Instead, organizations should be proactive in implementing methods that can help to care for and manage these patients during their time in the ED. Design solutions should be properly evaluated to assess their ability to manage effectively behavioral health patients in the ED while mitigating the risk of boarding them for extensive periods of time.

Purpose of the Study

The purpose of this study is to examine key design features implemented in selected EDs and evaluate their efficacy in managing behavioral health patients throughout their course of treatment. This study focuses on three major areas that may contribute to behavioral health patient care in the ED: furniture and fixture solutions, spatial configurations (i.e. designated holding areas, treatment areas), and environmental features and controls. Solutions rendered effective as a result of this study can help to provide other organizations with potential solutions that can be implemented in their Emergency Departments to help manage these patients.

Research Objectives

The study addressed the following research objectives:

1. To identify potential issues that could present by holding behavioral health patients in the ED.
2. To assess current methods utilized by clinical teams in the ED to manage behavioral health patients.
3. To describe current healthcare design solutions (i.e. furniture, fixtures, lighting, color schemes, configuration of treatment areas) in the healthcare industry formulated to help manage behavioral health patients.

Delimitations

The study was delimited in the following areas:

1. The sample of respondents was not randomized but relied on convenience sampling via survey volunteers. Therefore, the results cannot be generalized to the population of front-line staff.
2. The sample was derived from clinical nursing staff working in the ED across three selected hospitals in Nacogdoches and Angelina counties within the state of Texas. These hospitals cannot be considered representative of all rural hospitals.
3. Respondents self-reported responses on perceived safety in their clinical work environments.

Definition of Terms

For additional clarity, key terms that may be unfamiliar to the reader have been defined in Appendix A. Please refer to this section for additional information.

CHAPTER 2

Review of Literature

It is not easy to predict when behavioral health patients will arrive or how acute their needs may be (Cox, 2018). As a result, Emergency Departments (EDs) must be prepared to accept and treat members of this vulnerable population at any time in a safe environment. In addition, due to the complexities of this patient type, providers are still attempting to define the components of appropriate behavioral health care. Once this definition is understood, organizations can design solutions that are more welcoming and appropriate for these patients (Reem, 2017). As stated in the *2018 Facility Guidelines Institute (FGI) Guidelines for Design and Construction of Hospitals*, “A safe environment is critical; however, no environment can be entirely safe and free of risk. Each organization will need to determine the appropriate environment for the treatment programs it provides and the patients it serves” (Cox, 2018, para. 7).

According to Reem (2017) in *Health Facilities Management*, “the design strategy is one that is human-centered, finding a balance between dignity and safety” (para. 2). In order to achieve safety, previous designs emphasized limiting patient movement through the use of restraints and seclusion at the cost of patient choice and comfort. These strategies “often created harsh environments with severe physical and perceived boundaries between patients and staff”

(Reem, 2017, para. 25). If planned correctly, clinical environments can help to reduce restraint utilization and seclusion techniques implemented to protect patients and staff (Reem, 2017).

In a study entitled Mental and Behavioral Health Environments: Measurement of Building Performance, Shepley et al. surveyed psychiatric nursing organizations and treatment facilities to understand which design features staff prefer to have present when caring for behavioral health patients. Conclusions of the study showed a statistical difference between clinical staff's perception of the importance of a design feature and it's efficacy. These findings suggested the existence of a gap between what the staff feels is important in the clinical environment to care for behavioral patients and what is actually available. Study respondents considered a well-maintained care environment (e.g., visually appealing furniture and furnishings, appropriate storage for equipment supplies, lack of clutter) and access to nature (e.g., outdoor group areas, views of gardens and/or landscapes) to be the most important positive contributors to patient care. While the need for durable, damage-resistant furniture was evident, specific design features considered to be most important by clinical staff were those that promoted staff safety, provided noise control, and optimized the amount of natural light entering the care environment (Shepley et al., 2016).

While there are several existing solutions related to the physical configuration of the treatment areas, environmental features controls (i.e. colors,

patient-controlled lighting), and furniture and fixtures in these care areas, there is limited research on which solutions have produced optimal results and/or are preferred by clinical staff after implementation. This review of literature attempts to explore different design solutions that have been developed and implemented in ED for the management of behavioral health patients seeking clinical intervention.

Environmental Features and Control

The ED physical environment plays a role in the overall outcomes and care for patients. Spaces should feel calm and respectful to both patients and staff (Reem, 2017). According to Thorsen (2018), design features providing natural daylight help to reduce anxiety. A study by Roger Ulrich further supported this notion as access to natural light yielded lower depression rates, length of stay, stress, reported pain, and subsequent use of pain medications among the patient population studied. These patients also reported improved sleep quality and patient satisfaction (Schwindel, 2011). As access to natural light has been found to be therapeutic for patients, designers are often tasked with integrating glass wherever possible to maximize the amount of light in an area while still balancing safety and budget (Turner, 2015). As depicted in in bold lines in Figure 2, the Emergency Center at Ocean Medical Center in New Jersey was designed to maximize the amount of natural light in behavioral health holding rooms (WHR Architects, Inc., 2016).

Figure 2. *Ocean Medical Center design for natural light into ED behavioral health area* (WHR Architects, Inc., 2016).

Design elements that offer patients choice and control provide calming perceptions during their stay. Features like color-changing accents and dimmable lighting provide patients the ability to tune music and lighting to a level with which they are comfortable, helping them to self-regulate and lower stress levels

(Reem, 2017). “Transitions between spaces are carefully considered and may include features such as semi-transparent doors so the patient is offered a glimpse of the activity within the unit before entering, reducing apprehension that may be associated with an unknown space” (Reem, 2017, para. 7). Based on a post-occupancy evaluation completed for a behavioral health unit at Swedish Medical Center-Ballard in Seattle, Washington, communal spaces that employed neutral natural tones and color palettes were perceived to be calming and tied to positive patient experiences (Thorsen, 2018).

Another way to offer patients choice is to have a variety of treatment rooms that patients can access outside of the exam room to meet multiple needs across different patient types. Within these areas, offering different seating options provides patients an opportunity to select seating that is most comfortable (Reem, 2017). In some instances, the inclusion of sensory rooms provides patients a destination of respite during emotional crises. According to DiNardo (2015), “these quiet rooms may offer aromatherapy, music, mood lighting, blankets, and soft furniture, and patients have a degree of control within the space, whether it’s the lights, sound, temperature, or music” (para. 24).

At the University of Minnesota Masonic Children’s Hospital, patients can visit a quiet room and an activity room. As depicted in Figure 3, the quiet room is outfitted with soft colors, curved walls, adjustable lighting, and a circular wall alcove with window bench for focused relaxation. The activity room features a

large projection screen, adjustable accent lights, and interactive floor tiles for patients to express themselves through movement.

Figure 3. *Quiet room at University of Minnesota Masonic Children's Hospital* (Reem, 2017).

These additional spaces have been cited by staff as having a positive impact, as they provide patients with opportunities to self-select and recognize their preferred environments in which they can manage and cope with their behavioral conditions. They allow staff to work collaboratively with patients to

understand and address patient concerns, while reducing the need to apply physical restraints during patient care (Reem, 2017).

Furniture and Fixtures

When designing for the behavioral health population, safety is achieved by attention to every detail however; in order not to compromise the overall design, these details must be considered in tandem with spatial design (Turner, 2015). According to Turner (2015),

> No matter how beautiful and engaging a space is, there will always be patients who are not happy about being there, and many patients may be there against their will. They may not fully understand what is happening to them and many are dealing with severe difficulties. An unfortunate fact of psychiatric care is that some patients will try to harm themselves. As the designer of this type of facility, you must anticipate designing the facility to minimize potential risks to the patient. The stakes are too high for this issue to be treated with anything but the utmost respect (para. 5).

The use of ligature-resistant fixtures in behavioral health environments has become common practice in the industry. As depicted in Figures 4 and 5, ligature-resistant fixtures typically are shatterproof, have sloped tops, recessed toilet paper dispensers, and toilet and sink fixtures without potential attachment points for patients to do harm. Utilization of push-button controls and automatic sensor controls help to significantly reduce ligature points (Cox, 2018).

Figure 4. *Ligature-resistant fixtures* (Cox, 2018).

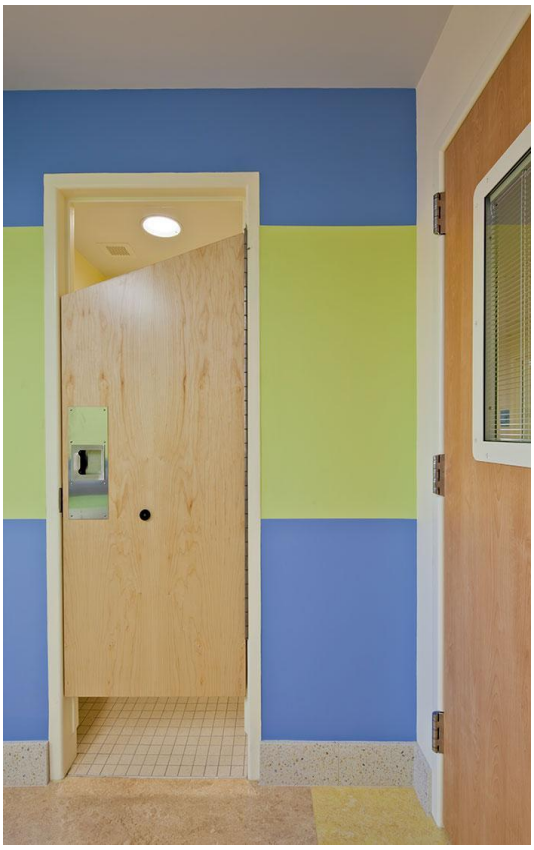

Figure 5. *Ligature-resistant doors* (Reem, 2017).

In addition, finishes in behavioral health spaces should be durable due to the amount of wear and tear that will likely occur. Flooring should be selected while taking pattern and color into account. In many cases, terrazzo is the preferred option, but it is often cost prohibitive for many organizations. Fluid-applied epoxy has been identified as a viable alternative and is easy to care for long term. The glazing on glass utilized in these spaces should be safety-laminated to ensure patients cannot break through the glass to injure themselves or others (Turner, 2015).

Spatial Configurations

EDs across the country are designed with a multitude of configurations to meet the needs of the organization, staff, and population served. Each spatial configuration has benefits and challenges that impact the staff and patient experience.

Assessment and consult areas. As depicted in Figure 6, quick patient assessment areas located in emergency departments provide environmental solutions in which “mental health professionals can meet with patients in more of a clinic setting that features lounge-type settings and consultations rooms” for more private conversations (Sanders, 2017, para. 4).

Figure 6. *Consult area for staff and patient conversations* (Sanders, 2017).

Nurse stations. In *Healthcare Design Magazine*, J. Mural (2015) suggested the existence of a disconnect between the use of enclosed nurse stations and the perception provided to patients. As design has evolved over the years, trends have started to implement open nurse stations in the behavioral health care environment. There are three potential configurations that should be evaluated prior to implementation in any care area: open, partially-open, and fully-enclosed nurse stations.

As depicted in Figure 7, open nurse stations provide minimal barriers between staff and patients, helping to increase communication during care as

well as unobstructed auditory and visual monitoring. In an open environment, staff members are part of the unit instead of being isolated, posing a safety risk if patients become violent.

Figure 7. *Open nurse station in Ellis Medicine ED* (Emergency Department – Ellis Medicine, 2019).

Depending on the organizational viewpoint, open nurse stations may be best implemented in environments where patients are less prone to violent behavior (Mural, 2015). During facility redesign at Pine Rest Christian Mental Health Services in Grand Rapids, Michigan, staff were initially concerned with

patients' ability to climb over the counter and induce harm; however, "instead they've found improved comingling between the staff and patients as well as decreased agitation and anxiety among patients" (DiNardo, 2015, para. 20).

Partially open nurse stations provide a combination of partition-height separations and counter-depth spaces. These design features make staff less accessible in case a violent situation arises while still maintaining a partially open barrier (Mural, 2015).

In traditional settings, areas in which behavioral health patients are seen are outfitted with a fully enclosed nurse station, providing staff physical protection against violent patients, as needed. While this option provides a completely enclosed physical protection barrier for staff, it prevents auditory control and significantly limits staff and patient interactions. In addition, this design, has traditionally communicated to patients that they are dangerous individuals who must be secluded from others, tending to be less conducive to a therapeutic environment (Mural, 2015).

Ultimately, existing research does not provide a consensus on staff preference for or efficacy of open versus enclosed nurse stations. This decision is often left to the organization's clinical leaders and design team to identify the best solution in which to deliver patient care (Mural, 2015).

Flexible exam rooms vs. designated treatment areas. Due to the wide range of conditions that fall within the behavioral health umbrella, "finding the

appropriate environment of care for an ED beyond 1:1 patient monitoring can range from providing one or two appropriate rooms to a whole section of an ED dedicated to behavioral health" (Cox, 2018, para. 8). In the industry today, some organizations have started to shift to a behavioral health section, while others prefer to flex existing exam room utilization based on if or when a behavioral health patient requires treatment.

When a patient arrives to the ED and reports a behavioral health ailment as a complaint, clinical staff often perform a quick assessment to collect preliminary health information and identify any additional medical ailments. Once this assessment is complete, the patient may be escorted to either a standard exam room within the ED or a designated behavioral treatment area in or adjacent to the main ED,

According to a survey conducted by *Emergency Physicians Monthly* on the introduction of psychiatric units as part of emergency departments, "36% had established a separate unit for patients with behavioral and psychiatric issues while 64% had not yet set up such units" (Levin-Epstein, 2015, para. 37). Additional survey results included the following:

- There were a multitude of reasons for creating separate ED units, including segregating patients with behavioral problems from those with other conditions; establishing a safe, secure area to handle patients with behavioral issues, especially those prone to violence;

dealing with an increasing volume of patients in the emergency room; streamlining care; and attempting to eliminate patients remaining in emergency departments for lengthy stays.

- Almost one-third of the respondents indicated that emergency department staff members were concerned about the risks posed by patients with behavioral issues to other patients. Of those reporting no concerns, however, 17 [of the 58 respondents] had independent units established to deal with patients with behavioral problems. (One respondent reported having three dedicated beds under the direct line of sight by local law enforcement officers and under video surveillance for patients under involuntary holds).
- The separate units are usually staffed by an ED physician but some also include a psychiatric nurse, social worker, or aide (Levin-Epstein, 2015)

Flexible exam rooms. For organizations wishing to utilize existing exam rooms to treat behavioral health patients, The Joint Commission advises that ED rooms can be designed with a metal roller door to quickly hide in-wall gases, equipment, and other room elements to make an exam room safe for behavioral health patients. Additionally, it is considered advantageous to co-locate consult space with flex ED rooms in case additional interventions are needed as depicted in Figure 8 (Cox, 2018).

Figure 8. *Flex ED room with adjacent consult space at Fairview Southdale Hospital ED in Edina, MN* (Sanders, 2017).

Behavioral health safe rooms within the main ED should not be located close to an entrance or exit as it poses a risk of elopement. Organizations will need to consider exactly how a room will be outfitted, especially considering clinical desire to flex exam rooms to serve other patients when not being used for behavioral health. According to Cox (2018), “rooms not intended for 1:1 observation should be ligature-, tamper-, and abuse-resistant, and have visual access and security” (Cox, 2018, para. 12). In addition, it is ideal to have rooms outfitted with soothing lighting that patients can control during their care to provide a sense of control over their environment (DiNardo, 2015).

Designated behavioral treatment areas. For organizations wishing to physically separate behavioral patients from the general ED population, designated treatment areas for these patients can be established. As depicted in

Figure 9 on the right side of the diagram, these designated areas are often physically located within the ED but segregated into a separate area or physically located outside yet adjacent to the ED.

Figure 9. *Example of behavioral health treatment unit within the ED* (WHR Architects, Inc., 2014).

EmPATH units. Behavioral health patients tend to perform better in calm settings with a trained psychiatric team. Over the past few years, a new model for behavioral health design has emerged across the nation called an emergency Psychiatric Assessment, Treatment, and Healing (emPATH) unit. EmPATH units are part of a hospital-based program model that readily accepts behavioral health

patients in the ED. These units are designed as a destination for behavioral health patients, serving as the area in which treatment, observation, and disposition decisions are made after an extensive psychiatric evaluation has been completed (Zeller, 2017).

Emphasizing empathy over involuntary treatment, emPATH units combine the calming, supportive atmosphere found in many community crisis clinics with the ability to accept acute psychiatric patients. While the physical layouts of emPATH units vary by needs of the organization, all configurations include a large central room in lieu of individual exam rooms. Equipped with patient recliners which can be rearranged for socialization or to provide personal space, “The entire atmosphere is one of calming and healing, where needs can be met, frustrations are minimized, and therapeutic interventions can be allowed the time and space to be effective” (Zeller, 2017, para. 8). This room is decorated using a soft color palette, calming artwork, and is outfitted with ambient lighting with windows to the outside implemented wherever possible (Zeller, 2017).

In addition to the central room, one design feature that stands out among all emPATH units is that staff are co-located with the patients, not situated behind a glass-enclosed nursing station. EmPATH units across the country have reported “substantial improvements in outcomes, safety, and patient satisfaction, while dramatically reducing the need for coercive measures, decreasing episodes of agitation and physical restraints, and diverting unnecessary

hospitalizations, all at substantially lower costs than the status quo" (Zeller, 2017, para. 5).

Johns Hopkins Suburban Hospital ED. Designed to replace its dedicated behavioral health pod in the main ED, the Johns Hopkins Suburban Hospital ED opened its psychiatric ED in April 2018. Previously an office suite, the unit is comprised of six patient rooms (one with a private restroom for solitary care) and a shared lounge. As a destination for socialization, the lounge is furnished with rocking chairs that cannot be thrown easily (approximately 50 lbs in weight) and equipped with a television located within a locked cabinet with hidden wire connections. Individual patient rooms contain only a bed and a security camera. The rooms are outfitted with dimmable lighting, closeable doors with small windows for both visualization and patient privacy, and anti-ligature fixtures to ensure patients cannot harm themselves (Nitkin, 2018).

Special emergency care unit (SECU). In Bellingham, WA, St. Joseph Medical Center opened a five-bed special emergency care unit (SECU) from its 39-bed ED to effectively manage an increase in behavioral health patient visits. The SECU, while still considered part of the ED, was physically located outside of the main ED. The unit included enhanced security features including "secured access to the unit, storage of in-room gases and equipment within locked cabinets, and acrylic glass windows that allow for visualization by staff into the unit and individual rooms" (Tavernero, 2015, para. 14).

The SECU is staffed 24/7 by a behavioral health counselor, social worker, and psychiatric nurse to provide assessments and regular interventions. A psychiatrist performs rounds on patients in the SECU as needed prior to discharge. Since implementation, the St. Joseph Medical Center ED has experienced a 50% reduction in violent encounters against staff and a 50% reduction in patient elopements. Additionally, the use of restraints and seclusion has decreased from 25 episodes per 1,000 patients to 7 episodes per 1,000 patients (Tavernero, 2015).

Unity Center for Behavioral Health. The Unity Center for Behavioral Health opened in Portland, Oregon, in 2016. Designed with 36 recliners, two comfort rooms, and two closed seclusion rooms (Oelrich, 2016), the Center employs a multidisciplinary method of care utilizing a social worker, nurse, and psychiatrist to perform a quick assessment upon entry into the facility (Farentinos, 2017). The goal of the Unity Center is to provide psychiatric treatment as quickly as possible in a safe and comfortable environment for patients and staff utilizing a team-based approach to care (Oelrich, 2016). As depicted in Figures 10 and 11 (Oelrich, 2016), the Unity Center evokes a living room-like setting with multiple seating and privacy options for patients (i.e. recliners, tables, and task chairs) (Farentinos, 2017) in which staff can monitor individuals from an open nurse station in a comfortable environment (Oelrich, 2016). Remarkably, the Unity Center has seen great success, serving an average of 30 patients per day in the

facility. According to C. Farentinos, the Director of the Unity Center, the “Unity Center discharges 77% of the patients who seek care within an average of 20 hours of stabilization, crisis intervention, and discharge planning” (Farentinos, 2017, para. 7).

Figure 10. *Unity Center for Behavioral Health open layout* (Oelrich, 2016).

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Figure 11. *Unity Center for Behavioral Health nurse station* (Oelrich, 2016).

Unity Point living room. To provide alternative models of care for behavioral health patients to be assessed and diagnosed, the Unity Point Emergency Department in Rock Island, IL, designed a dedicated Behavioral Health treatment area for patients once they have been medically cleared. Staffed with behavioral health nurses, social workers, and peer mentors who help assess patients, provide observation, and support when needed, the unit is designed with six private treatment rooms, two consult rooms, a central team

station, and a living room. As rendered in Figure 12, the living room is designed with home-like features, utilizing soft lighting, wood materials, an aquarium, calming artwork, and comfortable seating. It can accommodate peer-to-peer counseling and family visits with patients during their stay. While no empirical data exists yet to reflect effectiveness, the project has met its goals to de-escalate patients in the care environment (Stroupe, 2019).

Figure 12. *Unity Point ED behavioral health living room.* Stroupe, J. (2019).

Conclusion

Allen Jansen, the Corporate Director of Pine Rest Christian Mental Health Services, reported the following after speaking with staff following the opening of their new facility (Bazuin & Hicks, 2014):

> The consumers, who could by anyone's definition be considered 'the least of these' are dignified and honored by what they now enter. Social justice is a component of much of our day to day work, but we didn't know the new space, the coordinated colors, the welcoming entrance and the comfortable treatment spaces would contribute so much to the wellbeing of so many people who deserve nothing less (para. 30).

With every new design solution that has been discovered for behavioral health, the impacts are immeasurable in terms of how they contribute to the patient care experience. In the realm of behavioral health design, there is still plenty of research that needs to be done to identify appropriate solutions for the environments in which this vulnerable population is treated. The existing literature documents the types of solutions that are available. There is evidence of some solutions yielding desired outcomes and meeting project goals once implemented. Even with these solutions, however, the behavioral health crisis demands further exploration for improving the built environment.

Missing from the literature are post-occupancy studies of how many of these design solutions have performed after implementation. Although design trends are being implemented, limited research exists around what methods are preferred by clinical staff and what staff perceptions are of the efficacy of improving patient care and reducing safety risks.

CHAPTER 3

Methodology

This study investigated design features implemented in selected Emergency Departments (EDs) and evaluated their efficacy in managing behavioral health patients throughout their course of treatment. As respondents participated in the study on a volunteer basis, the factorial design quasi-experimental research method was utilized throughout the study to measure the interaction effects of each variable being studied.

Sample

Administrators from three hospitals offering emergency services in rural east Texas (Nacogdoches Medical Center, Nacogdoches Memorial Health, Woodland Heights Medical Center) consented for their staff to participate in the study. Identification of eligible study participants was in partnership with the researcher, hospital administration, and/or ED clinical leadership. Participation in the study depended on the availability of clinical nursing staff members to complete the survey during their scheduled shift in the ED. As a result, a non-probability convenience sampling technique was utilized.

Based on estimated respondent size at each site, approximately 100 surveys were printed for administration to survey respondents. Study respondents were comprised of clinical staff with a professional nursing degree

who were currently employed in the ED of one of the three sampling sites. The survey requested feedback on certain experiences these professionals have had in the ED while treating behavioral health patients, design features that were present in their current ED department that are utilized to help manage this population, and what design features should be implemented in their current environment to help them better manage this vulnerable population in the future.

Materials

A multi-page, paper-based survey was distributed at each sample site in Summer 2019. The survey was drafted using the design of the Clinic Design Staff Survey and Patient-Clinician Interaction Spaces Survey as a basis for tool development (Clinic Design Post-Occupancy Evaluation Toolkit, 2015). The survey was edited and adapted to fit the needs of this research to ensure all study variables could be appropriately investigated. Please refer to Appendix B for additional information on the survey tool used in this study.

The survey content addressed a variety of subject areas, utilizing a Likert-type scale to measure a negative or positive response from respondents. The researcher sought to gather feedback on staff work experience and the physical work environment, environmental features and controls (i.e., noise levels, colors, materials), furniture, and spatial layouts within the ED setting, which was then utilized to determine respondent opinion.

Survey Administration

All surveys were distributed and collected by the researcher and/or ED clinical leader in June-August 2019 during either the day or night shift, Sunday-Saturday. Survey respondents should have been able to complete the paper-based survey in ten minutes or less. Respondents were given approximately one month to complete the survey.

The researcher or clinical leader in the ED distributed surveys to respondents by hand. In cases where this was not feasible, blank surveys were kept in a manila envelope at a designated nurse station or staff lounge for respondents to obtain and complete.

Data Collection and Oversight

Due to the desire to involve human subjects in the study, the researcher applied for approval through the Institutional Review Board (IRB) at Stephen F. Austin State University. Please see Appendix C for IRB approval letter. Upon successful IRB approval, surveys were distributed to voluntary survey respondents at all sites. Completed surveys were returned to the ED clinical leader and/or placed in a secured collection box or envelope at each site. The researcher was in communication with ED leadership to understand the rate at which surveys were completed to determine a survey gathering timeline. Once most responses were complete, the researcher collected all surveys to input and analyze the data.

IBM SPSS Statistics version 26 software was utilized to analyze the data collected in this study. The five-point Likert scale responses were coded to numerical values to enhance descriptive statistic measures (see Table 13). Analysis involved the completion of frequency tables, crosstabulation, and measures of central tendency and dispersion. All data was entered manually by the researcher into the SPSS statistical analysis software.

Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Don't Know	Not Applicable	No Answer
1	2	3	4	5	-1	-2	0

Figure 13. Survey response coding

Completed surveys provided the researcher with insight into which design features of the physical ED environment were currently being utilized to help care for behavioral health patients. Survey responses helped to identify which design features clinical staff deem as viable solutions for managing this patient population in the future.

Due to the voluntary participation of survey respondents in the study, consent forms were collected, but no personal information was recorded. Signed consent forms were separated from completed surveys and stored separately. Within one month of study completion, all surveys were shredded and disposed of in the researcher's home.

The research provided minimal risk to the survey respondents. Risk may have included slight psychological discomfort while honestly answering questions about current work environment.

Target Data Collected

The survey collected both demographic information and respondent opinion. Respondents provided data through both open and close-ended items.

Demographic information. The survey collected self-reported respondent information on demographics. The demographics included respondent gender, tenure at organization (years), tenure in ED nursing career (years), employment status, and work shift.

Respondent opinion. The survey collected self-reported respondent opinions using the Likert scale on the following items:

- Identification of key situations in which staff struggled to manage behavioral health patients in the ED
- Identification of design features (i.e. furniture solutions, environmental controls, aesthetics, space configurations, etc.) currently being utilized to manage behavioral health patients in the ED
- Identification of preferred design features (i.e. furniture solutions, environmental controls, aesthetics, space configurations) that could be utilized in the future to help manage behavioral health patients in the ED

- Overall perception of safety and efficacy of the current environment in helping to manage behavioral health patients in the ED

Variables of Study

Several independent and dependent variables were investigated throughout this study. These variables, outlined below, were analyzed to gauge staff perception of effective solutions for managing behavioral health patients in the ED.

- Gender
- Tenure at present hospital
- Career tenure
- Past experiences with behavioral patients
- Presence and type of design solutions in the ED (ex. color, furniture, layout)
- User preference for a design solution

Research Questions and Tested Hypotheses

This study qualitatively explored staff perspectives on ED design at three rural hospitals located in eastern Texas. Based on the objectives of this study, research questions were as follows:

1. What issues have staff members experienced in their ED while caring for behavioral health patients?

2. What design features do staff member currently have available in their existing ED to help manage behavioral health patients?
3. Of the design features identified, which design features do staff members perceive to be most effective to help manage behavioral health patients?
4. What design elements would staff members like to implement in their current ED to help better manage the behavioral health patient population seen?

Based on these research questions, the researcher tested the following hypotheses:

1. Evaluation of the existing ED environment varies by user work experience at the present hospital.
2. Evaluation of design features present in the existing ED environment varies by career tenure.
3. Evaluation of the existing ED environment varies by facility surveyed.
4. Males and females evaluate the efficacy of design solutions differently.

By testing these hypotheses, the researcher was able to evaluate and describe the design solutions that are considered effective by ED staff to help manage behavioral health patients. The research objectives, site consent, survey development, and IRB approval helped contribute to the success of this study.

CHAPTER 4

Results

This study examined key design features implemented in select Emergency Departments (EDs) and evaluated their perceived efficacy by staff in managing behavioral health patients throughout their course of treatment. Focus was given to features that might affect behavioral health patient care in the ED, specifically furniture and fixture solutions, spatial configurations, and environmental features and controls available. Participants completed a paper-based survey to communicate their opinions on their existing ED environment. The five-point Likert scale responses were coded to numerical values to enhance descriptive statistic measures (Figure 13). The results in this chapter have been organized by research question, with analysis on the quantitative and qualitative data where appropriate. In some cases, a cumulative score was generated by summing respondent feedback across all questions within a category to provide a basis for comparison.

Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Don't Know	Not Applicable	No Answer
1	2	3	4	5	-1	-2	0

Figure 13. Survey response coding

Demographic Information

The researcher distributed paper-based surveys at Woodland Heights Medical Center in Lufkin, TX, Nacogdoches Memorial Health, and Nacogdoches Medical Center, respectively. Table 1 summarizes the demographic data of survey respondents utilizing several categories. With an estimated potential ED population size of 100 across hospitals, the total sample size was comprised of 56 ED nursing staff members. Approximately one-third of respondents were male. The majority of respondents worked full-time (98.1%). Of the 56 respondents, 46 (76.1%) had less than 10 years of work experience in the ED at their current location. Less than 12.7% of survey respondents (n=7) had more than 10 years of work experience in the ED, including at their current organization and previous places of employment. The median response group had 6-10 years of work experience as an ED nurse (50.9%). In addition, two-thirds of survey respondents most frequently worked the day shift.

As reflected in Table 2, the majority of respondents answered favorably toward teamwork (M = 4.54, SD = 0.87) and collaboration between staff (M = 4.50, SD = 0.83) while on the job. Mean responses for all work experience questions scored above 4 on the Likert scale between “Agree” and “Strongly Agree.” Staff answered least favorably toward feeling safe while caring for behavioral health patients in the ED with a mean response of “Neither Agree or

Disagree.” The mean response did not fall below “Neither Agree or Disagree” as all means scored higher than 3 on the Likert scale.

Table 1

Demographic Characteristics of Participants

Characteristics	Woodland Heights Medical Center	Nacogdoches Memorial Health	Nacogdoches Medical Center	n	%
Gender	14	19	22		
Male	3	9	6	18	32.7
Female	11	10	16	37	67.3
Years with Current Employer					
Less than 1 year	2	1	6	9	16.1
1-5 years	2	12	5	19	33.9
6-10 years	9	2	7	18	32.1
11-15 years	0	0	3	3	5.4
16-20 years	1	1	1	3	5.4
21 or more years	0	4	0	4	7.1
Years as an ED Nurse					
Less than 1 year	1	0	6	7	12.7
1-5 years	0	11	2	13	23.6
6-10 years	13	5	10	28	50.9
11-15 years	0	0	2	2	3.6
16-20 years	0	0	1	1	1.8
21 or more years	0	4	0	4	7.3
Employment Status					
Full-time	14	20	21	55	98.2
Part-time	0	0	1	1	1.8
Most Frequent Shift Worked					
Day Shift	9	14	15	38	67.9
Night Shift	5	6	6	17	30.4
Other (both)	0	0	1	1	1.8

Note. Total years worked includes both previous and current places of employment. One survey respondent left this question blank.

Table 2

Summary of Responses to Work Experience Questions by Category

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Mean	Std. Dev.
There is a lot of teamwork among the staff.	0.0%	7.1%	3.6%	17.9%	71.4%	4.54	0.87
The staff generally cooperates with each other.	0.0%	3.6%	10.7%	17.9%	67.9%	4.50	0.83
I have often been nervous as a result of my job.	3.6%	21.4%	23.2%	37.5%	14.3%	3.38	1.09
My job bothers me more than it should.	3.6%	14.3%	17.9%	35.7%	28.6%	3.71	1.14
Sometimes when I think about my job I get a tight feeling in my chest.	3.6%	12.5%	14.3%	37.5%	32.1%	3.82	1.13
This job lives up to my expectations.	0.0%	23.2%	23.2%	44.6%	8.9%	3.39	0.95
Knowing what I know now, I would apply for this job again.	3.6%	1.8%	32.1%	30.4%	32.1%	3.86	1.02
The job does not negatively affect my health.	5.4%	16.1%	21.4%	30.4%	26.8%	3.57	1.20
I feel safe while caring for behavioral health patients.	12.5%	10.7%	41.1%	23.2%	12.5%	3.13	1.16

Note. There were zero respondents who answered questions in this section with “Not Applicable” and “Don’t Know.” As such, these response categories were omitted from the summary table.

Response Data

The researcher analyzed responses received to environmental support and design features available while caring for behavioral health patients. Responses revealed a similar sentiment between staff at all facilities surveyed.

Issues presented from holding behavioral health patients in the ED. When asked to identify stressful or dangerous issues that had occurred in their existing ED while caring for behavioral health patients, staff responses received across all facilities reported situations that endangered the safety of both patients and staff as well as challenged specific elements in the ED they believed were

missing or of operational concern. Appendix D provides additional information on open-ended survey responses received.

One nurse noted, “patients with combative nature can cause issues (drug-induced or due to mental illness). I’ve seen patients ram their beds into the wall even with the brakes on.” Another noted, “we have had several aggressive patients with irrational delusions who have and/or would have become a danger to others; one patient brought in a gun.” Acts of violence and assault against staff were also common themes in the feedback received. One respondent wrote the following:

> A psychiatric patient under an EPOW (emergency peace officers warrant) came out of the room and assaulted two of the nurses, there were no officers around at the time to help; another psychiatric patient under an EPOW with an officer in the room tried to overcome the officer and attempted to take his gun and the doctor and another nurse had to help hold him down until backup arrived.

Staff attributed the existing challenges in the ED to both spatial and operational elements. Staff specifically cited inpatient bed placement as an issue, increasing the occurrence of behavioral health boarding in the ED. According to one respondent, “it’s not uncommon for patients to sit in the ER for a week awaiting a bed.” These challenges, while not able to be controlled fully by the ED,

were partially attributed to “small rooms,” a lack of constant security presence in the ED, and a lack of designated/adequate behavioral health space in the ED.

As depicted in Table 3, within their existing ED environments, staff members believed their current work environment encouraged collaboration and communication among the care team, making it easy to know the status of their teammates. On average, survey participants responded most favorably to the following statements within the Emergency Department Environment section of the survey:

- The ED environment facilitates communication and teamwork among staff (M = 4.04, SD = 0.99).
- The ED environment makes it easy to know other staff’s status (M = 3.79, SD = 1.14).
- The ED environment encourages an emphasis on infection prevention (M = 3.73, SD = 0.88).

As depicted in Table 3, staff members believed their current work environment was not conducive to working with or supporting the treatment of behavioral health patients due to insufficient space and a turbulent and stressful ED. Survey respondents responded least favorably to the following statements within the Emergency Department Environment section of the survey:

- Overall, I am satisfied with the physical environment of this ED in supporting my work with behavioral health patients (M = 2.71, SD = 1.21).
- The ED provides a calming, supportive environment for behavioral health patients (M = 2.61, SD = 1.00).
- Sufficient space is available to accommodate patients in various stages of the ED visit (check-in, waiting, exam room, etc.) (M = 2.75, SD = 1.21).

Table 3

Summary of Responses to Emergency Department Environment Questions by Category

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Mean	Std. Dev.
The ED environment facilitates communication and teamwork among staff.	0.0%	14.3%	3.6%	46.4%	35.7%	4.04	0.99
The ED environment makes it easy to know other staff's status.	3.6%	14.3%	12.5%	39.3%	30.4%	3.79	1.14
The ED environment encourages an emphasis on infection prevention.	0.0%	5.4%	39.3%	32.1%	23.2%	3.73	0.88
The physical environment of exam rooms allows easy communication with patients.	0.0%	14.3%	23.2%	44.6%	16.1%	3.64	0.93
I can have a clear view of patients and the computer screen in the exam room or other procedure rooms.	0.0%	16.1%	23.2%	44.6%	16.1%	3.61	0.95

Table 3 (continued)

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Mean	Std. Dev.
The ED environment allows me to quickly locate equipment, patients, and other staff.	0.0%	7.1%	30.4%	60.7%	1.8%	3.57	0.66
The noise level in the ED does not interfere with communication to patients.	10.7%	16.1%	10.7%	44.6%	17.9%	3.43	1.26
Our staff work area has pleasant features.	5.4%	14.3%	30.4%	33.9%	16.1%	3.41	1.10
The ED environment provides a sense of privacy for patients.	0.0%	26.8%	19.6%	41.1%	12.5%	3.39	1.02
The ED atmosphere is tense and stressful for staff.	0.0%	21.4%	23.2%	51.8%	3.6%	3.38	0.87
The noise level is appropriate.	3.6%	19.6%	28.6%	33.9%	14.3%	3.36	1.07
Exam room location/design provides privacy and confidentiality.	0.0%	35.7%	10.7%	42.9%	10.7%	3.29	1.07
The ED clinical treatment area has a pleasing look.	12.5%	17.9%	19.6%	28.6%	21.4%	3.29	1.33
Supplies are conveniently located.	3.6%	19.6%	23.2%	51.8%	1.8%	3.29	0.93
Design features provide a safe environment for staff to administer care.	3.6%	5.4%	55.4%	33.9%	1.8%	3.25	0.75
The ED environment makes it easy for private conversations with patients.	0.0%	35.7%	23.2%	26.8%	14.3%	3.20	1.09
The ED environment is depressing.	3.6%	12.5%	44.6%	39.3%	0%	3.20	0.80
The floor plan of the ED makes it easy for staff to find what they need.	8.9%	10.7%	32.1%	44.6%	1.8%	3.20	0.99
Design features are durable enough to withstand high amounts of wear.	14.3%	7.1%	35.7%	35.7%	7.1%	3.14	1.14
The ED feels bright inside.	12.5%	21.4%	19.6%	33.9%	12.5%	3.13	1.25
Design features (for example, lighting control) in treatment areas help reduce energy consumption.	1.8%	23.2%	39.3%	32.1%	0.0%	3.06	0.81

Table 3 (continued)

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Mean	Std. Dev.
The ED atmosphere is tense and stressful for patients.	3.6%	28.6%	26.8%	32.1%	3.6%	3.04	0.98
Design features (for example, lighting control) in treatment areas are able to be controlled by patients.	1.8%	41.1%	8.9%	48.2%	0.0%	3.04	0.99
The ED environment makes patients feel relaxed.	5.4%	26.8%	41.1%	14.3%	12.5%	3.02	1.07
Design features minimize a patient's ability to do harm to themselves or others.	10.7%	19.6%	30.4%	39.3%	0.0%	2.98	1.02
Design features (for example, lighting and temperature control) in the ED help reduce stress for patients.	5.4%	35.7%	21.4%	37.5%	0.0%	2.91	0.98
The ED environment makes me feel safe and secure.	8.9%	12.5%	58.9%	19.6%	0.0%	2.89	0.82
Sufficient spaces are available to accommodate patients in various stages of ED visit (check-in, waiting, exam room, etc.)	17.9%	32.1%	8.9%	39.3%	1.8%	2.75	1.21
Overall, I am satisfied with the physical environment of this ED in supporting my work with behavioral health patients.	10.7%	35.7%	25.0%	28.6%	0.0%	2.71	1.00
The ED provides a calming, supportive environment for behavioral health patients.	30.4%	17.9%	16.1%	32.1%	3.6%	2.61	1.32

As shown in Table 4, respondents with 11-15 years of work experience on average provided the most positive feedback regarding the overall nature of their existing ED (M = 115.33, SD = 11.59) followed by respondents with less than one year of work experience (M = 111.33, SD = 19.23). Respondents with 1-5 years

of work experience in their existing ED provided less positive responses on average than all other respondent groups (M = 85.43, SD = 13.08). Mean differences identified across all facilities yielded significantly different results (F = 4.553, df = 5 and 43, p = .002). A Tukey test further identified three significant pairs of mean difference:

- Less than one year – one to five years (25.90)
- Less than one year – six to 10 years (19.27)
- 11-15 years – one to five years (29.90)

Based on these results, the data did not support the hypothesis that evaluation of the existing ED environment varies by user work experience at the present hospital.

Table 4

Emergency Department Environment Response Scores by Tenure with Current Employer

Years with current employer	Mean	N	Std. Dev.
Less than 1 year	111.33	9	19.23
1-5 years	85.43	14	13.08
6-10 years	92.06	16	17.40
11-15 years	115.33	3	11.59
16-20 years	103.33	3	2.31
21 or more years	101.00	4	.00
Total	96.55	49	17.85

As shown in Table 5, respondents with less than one year of total work experience on average provided the most positive feedback regarding the overall

nature of their existing ED (M = 120.00, SD = 9.93) followed by respondents with 11-15 years of total work experience (M = 116.00, SD = 14.14). Respondents with 1-5 years of work experience in their existing ED provided less positive responses on average than all other respondent groups (M = 90.40, SD = 11.08). A One-Way ANOVA was utilized to analyze the data. Mean differences identified across all facilities yielded significantly different results (F = 7.174, df = 4 and 44, p = .000). A Tukey test further identified two significant pairs of mean difference:

- Less than one year – one to five years (29.60)
- Less than one year – six to 10 years (29.58)

Based on these results, the data supported the hypothesis that evaluation of design features present in the existing ED environment varies by career tenure.

Table 5

Emergency Department Environment Response Scores by Career Tenure

Years as an ED nurse	Mean	N	Std. Dev.
Less than 1 year	120.00	7	9.93
1-5 years	90.40	10	11.08
6-10 years	90.42	26	17.16
11-15 years	116.00	2	14.14
21 or more years	101.00	4	.000
Total	96.55	49	17.85

As shown in Table 6, on average, respondents from Nacogdoches Medical Center provided the most positive feedback regarding the overall nature of their

existing ED (M = 102.80, SD = 18.53). Woodland Heights Medical Center (M = 92.42, SD = 20.24) and Nacogdoches Memorial Health (M = 92.12, SD = 13.57) received the second and third highest number of positively rated comments, respectively. While mean differences existed in Total Environment Score across all facilities, the results were not significant (F = 2.172, df = 2 and 46, p=.125). Based on these results, the data did not support the hypothesis that evaluation of the existing ED environment varies by facility surveyed.

Table 6

Emergency Department Environment Cumulative Response Scores by Facility

	Facility Name	N	Mean	Std. Dev.	Std. Error Mean
Total Environment Score	Nacogdoches Memorial Health	17	92.12	13.57	3.29
	Nacogdoches Medical Center	20	102.80	18.53	4.14
	Woodland Heights Medical Center	12	92.42	20.24	5.84

As shown in Table 7, on average female respondents provided more positive feedback regarding the overall nature of their existing ED (M = 98.79, SD = 19.68), with a higher level of variability than male respondents. While mean differences existed between the male and female gender, the results were not significant (F = 1.725, df = 1 and 46, p=.196). Based on these results, the data did not support the hypothesis that males and females would evaluate the efficacy of design solutions differently.

Table 7

Emergency Department Environment Cumulative Response Scores by Gender

	Gender	N	Mean	Std. Dev.	Std. Error Mean
Total Environment Score	Male	15	91.47	12.93	3.34
	Female	33	98.79	19.68	3.43

Current methods utilized to manage behavioral health patients in the ED. As part of the survey, respondents were asked to identify which design features were present in their ED. If present, staff members were asked to evaluate that criteria on their ability to manage the behavioral health population served within the facility.

Table 8 represents key design features respondents identified as present in the ED environment across all facilities surveyed. Design features with the highest means indicate a higher cited presence in the clinical environment. For example, 0.8 or 80% of respondents cited the presence of visual barriers within their ED. Across all facilities, only three facilities reported a design feature mean over 50%. Respondents reported the top design features present in the ED to be visual barriers (80%), attractive/inviting colors/materials (65%), and audio barriers (54%). The bottom three design features were daylight (0%); patient control of window blinds, air conditioning, etc. (0%); and nursing station in a central location (7%).

Table 8

Presence of Key Design Features In the ED

Design Feature	Mean	Std. Dev.
Visual barriers	0.80	0.40
Attractive/inviting colors/materials	0.65	1.07
Audio barriers	0.54	0.50
Noise reduction measures	0.39	0.49
Pod/design cluster	0.39	0.49
Video monitoring	0.34	0.48
Designated treatment area for behavioral patients	0.34	0.48
Size/layout to accommodate different patient/family groups	0.31	0.47
Nursing station with high visibility	0.29	0.46
Comfortable furniture	0.29	0.46
Positive distractions	0.27	0.45
Decentralized nursing station	0.23	0.43
Nursing station in central location	0.07	0.26
Patient control of window blinds, air conditioning, etc.	0.00	0.00
Daylight	0.00	0.00

Table 9 represents the design features identified by respondents in descending order separated by facility. Five of the design features yielded a moderate association with the facilities, while the remaining features reflected a weak association. Participant feedback showed Nacogdoches Memorial Health with over half of the design features queried and the highest quantity of design features present in the ED (7), followed by Woodland Heights Medical Center (4), and Nacogdoches Medical Center (2), respectively.

- At Woodland Heights Medical Center, the top design feature identified by respondents was visual barriers (86%). Audio barriers, pod/design cluster, noise reduction measures, designated treatment area for behavioral patients, comfortable furniture, positive distractions, and video monitoring all shared the second highest level of identification at 42.9%. No respondents (0%) identified the presence of daylight; patient control of window blinds, air conditioning, etc.; or nursing station in central location at Woodland Heights.
- At Nacogdoches Memorial Health, 100.0% of respondents identified the presence of visual barriers in the ED. The second and third tiers of design factors identified included audio barriers (65.0%) and pod/design cluster (42.9%), noise reduction measures (42.9%), and attractive/inviting colors/materials (42.9%), respectively. No respondents (0%) identified the presence of daylight or patient control of window blinds, air conditioning, etc. at Nacogdoches Memorial.
- At Nacogdoches Medical Center, the top design feature identified in the ED was visual barriers (59.1%). The second and third tiers of design features identified were audio barriers (50%) and comfortable furniture (36.4%), decentralized nursing station (36.4%), and nursing station with high visibility (36.4%). No respondents (0%) identified the presence of daylight; patient control of window blinds, air conditioning,

etc.; or nursing station in central location at Nacogdoches Medical Center.

Table 9

Presence of Design Features by Facility (Response Count by Category)

	Response	Woodland Heights Medical Center	Nacogdoches Memorial Health	Nacogdoches Medical Center	Cramer's V	Measure of Association
Audio barriers	Yes	42.9%	**65.0%**	50.0%	0.18 (p=.41)	Weak
Visual barriers	Yes	85.7%	**100.0%**	59.1%	0.45 (p=.00)	Moderate
Pod/design cluster	Yes	42.9%	**45.0%**	31.2%	0.12 (p=.65)	Weak
Noise reduction measures	Yes	42.9%	**45.0%**	31.2%	0.12 (p=.65)	Weak
Attractive/inviting colors/ materials	Yes	42.9%	**45.0%**	31.2%	0.11 (p=.72)	Weak
Size/layout to accommodate different patient/family groups	Yes	21.4%	**40.0%**	27.3%	0.16 (p=.51)	Weak
Designated treatment area for behavioral patients	Yes	**42.9%**	30.0%	31.2%	0.11 (p=.71)	Weak
Comfortable furniture	Yes	**42.9%**	10.0%	36.4%	0.31 (p=.07)	Moderate
Positive distractions	Yes	**42.9%**	10.0%	31.2%	0.30 (p=.08)	Moderate
Daylight	Yes	0.0%	0.0%	0.0%	n/a	n/a
Patient control of window blinds, air conditioning, etc.	Yes	0.0%	0.0%	0.0%	n/a	n/a
Nursing station in central location	Yes	0.0%	**20.0%**	0.0%	0.37 (p=.02)	Moderate
Decentralized nursing station	Yes	28.6%	5.0%	**36.4%**	0.33 (p=.05)	Moderate
Nursing station with high visibility	Yes	28.6%	20.0%	**36.4%**	0.16 (p=.50)	Weak
Video monitoring	Yes	**42.9%**	30.0%	31.2%	0.11 (p=.71)	Weak

Note. The highest % for each design feature has been bolded.

As shown in Table 10, of the design features available in their existing ED environment that could help with the care of behavioral health patients, staff generally favored features that provided privacy and visual monitoring. Staff responded less favorably toward the presence of features providing video

monitoring and access to daylight within the ED. The overall responses received varied from Strongly Disagree to Agree, with no design feature receiving a mean score over 3.53 (between Neither Agree or Disagree and Agree) for any of the 31 total items. Of the responses received, 10 items received a mean score above 3.0 (between Neither Agree or Disagree and Agree), 19 items scored between 2.0 and 2.99 (between Disagree and Neither Agree or Disagree), and two items received a mean score below 2.0 (between Strongly Disagree and Disagree).

On average, survey respondents responded most favorably to the following statements in the Patient-Clinician Interaction Space section of the survey (Table 10):

- Curtains and other visual barriers prevent patient-sensitive information (such as measurements of weight) from being viewed by other patients or staff (M = 3.53, SD = 0.90).
- Staff members are able to provide constant observation of patients without risking their own safety (M = 3.33, SD = 0.84).
- Nursing station is open, providing a minimal barrier between patients and staff (M = 3.30, SD = 0.82).
- The treatment area is staffed with clinical professionals who can treat patients when needed (M = 3.27, SD = 0.87).
- Solid doors and walls, curtains, and window blinds prevent patients in rooms from being seen from outside the rooms (M = 3.26, SD = 0.87).

Survey respondents responded least favorably to the following statements within the Patient-Clinician Interaction Space section of the survey (Table 10):

- Controls of air temperature, window blinds, and music selection/volume are within reach of most patients (M = 2.42, SD = 1.01).
- The exam rooms and other patient-staff interaction spaces are grouped in clusters or a pod design to help segregate behavioral health patients from the general ED population (M = 2.38, SD= 0.78).
- High-quality home-like or natural materials are used as interior finishes, creating a non-institutional ambiance for patients and families (M = 2.32, SD = 0.91).
- Windows and/or skylights provide plenty of direct or indirect natural light into areas in which behavioral health patients are treated (M = 1.96, SD = 0.88).
- Video monitoring system provides continuous coverage over all public areas and behavioral treatment spaces without blind spots (M = 1.71, SD = 0.92).

The presence of video monitoring and natural light within behavioral health areas scored lowest among all responses received with mean scores falling below 2 (between Disagree and Strongly Disagree).

Respondent feedback on one feature provided the greatest degree of variability. This feature was stated as solid doors and walls, curtains, and window blinds preventing patients in rooms from being seen from outside the rooms (M = 3.26, SD = 1.19).

Table 10

Summary of Responses to Patient-Clinician Interaction Space Questions

Design Feature	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Not Applicable/ No Answer	Mean	Std. Dev.
Curtains and other visual barriers prevent patient-sensitive information (such as measurements of weight) from being viewed by other patients or staff.	0.0%	19.6%	8.9%	57.1%	5.4%	8.9%	3.53	0.90
Staff members are able to provide constant observation of patients without risking their own safety.	1.8%	14.3%	28.6%	44.6%	1.8%	8.9%	3.33	0.84
Nursing station is open, providing a minimal barrier between patients and staff.	7.1%	28.6%	3.6%	53.6%	3.6%	/3.6%	3.30	0.82
The treatment area is staffed with clinical professionals who can treat patients when needed.	0.0%	23.2%	21.4%	44.6%	1.8%	8.9%	3.27	0.87
Solid doors and walls, curtains, and window blinds prevent patients in rooms from being seen from outside the rooms.	3.6%	42.9%	14.3%	30.4%	1.8%	7.1%	3.26	1.19
Plenty of seating is available for patients and their family members.	3.6%	23.2%	7.1%	46.4%	1.8%	17.9%	3.24	1.04

Table 10 (continued)

Design Feature	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Not Applicable/ No Answer	Mean	Std. Dev.
Staff member work areas are located with patient treatment spaces	3.6%	12.5%	37.5%	35.7%	1.8%	8.9%	3.22	0,86
Nursing staff members have a clear view of interaction spaces and corridors from the nursing station(s).	7.1%	28.6%	3.6%	53.6%	3.6%	3.6%	3.19	1.13
I feel safe in the nurse station when caring for behavioral health patients.	46.4%	23.2%	10.7%	5.4%	0.0%	3.6%	3.06	0.90
Patients have easy access to magazines, information booklets, TV, or internet.	5.4%	30.4%	21.4%	17.9%	12.5%	12.5%	3.02	1.18
The exam rooms and other patient-staff interaction spaces are grouped in clusters, or a pod design is used to make it easy to monitor and reach individual interaction spaces.	8.9%	16.1%	23.2%	32.1%	0.0%	19.6%	2.98	1.03
The nursing station is located centrally, providing easy surveillance of interaction spaces (e.g., exam rooms) and reducing staff traveling.	23.2%	14.3%	17.9%	25%	0.0%	5.4%	2.92	1.43
The exam rooms and other patient-staff interaction spaces are grouped in clusters, or a pod design is used to make the layout easier to understand.	8.9%	17.9%	26.8%	26.8%	0.0%	19.6%	2.89	1.01
Solid doors and walls sufficiently prevent the conversations in one room from being overheard by other patients in neighboring rooms/corridors.	10.7%	16.1%	7.1%	50%	5.4%	10.7%	2.83	1.00

Table 10 (continued)

Design Feature	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Not Applicable/ No Answer	Mean	Std. Dev.
The noise level in rooms does not interfere with communications between patient and staff, and between staff and members.	0.0%	32.1%	19.6%	16.1%	1.8%	30.4%	2.82	0.89
The decentralized nursing station is located close to interaction spaces (e.g., exam rooms), providing easy surveillance to the interaction spaces and reducing staff traveling.	10.7%	25.0%	16.1%	30.4%	0.0%	17.9%	2.80	1.09
Large rooms are available to accommodate patients accompanied by a large group of family members.	5.4%	25.0%	33.9%	17.9%	0.0%	17.9%	2.78	0.87
Sound-absorbing ceiling tiles and other noise-reduction measures are used so that the rooms and corridors are quiet.	1.8%	26.8%	26.8%	14.3%	0.0%	30.4%	2.77	0.81
Furniture is comfortable to use for the majority of patients.	8.9%	28.6%	32.1%	17.9%	1.8%	10.7%	2.72	0.97
There are dedicated behavioral health treatment rooms within each pod.	12.5%	16.1%	37.5%	14.3%	0.0%	19.6%	2.67	0.95
Exam rooms are equipped with mechanisms (ex. metal “garage door”) that can be used to hide room features as needed to protect behavioral health patients in the room.	8.9%	39.3%	12.5%	19. 6%	3.6%	16.1%	2.64	1.09
Furniture cannot be easily moved or manipulated to cause harm.	10.7%	35.7%	25.0%	14.3%	3.6%	10.7%	2.60	1.03

Table 10 (continued)

Design Feature	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Not Applicable/ No Answer	Mean	Std. Dev.
Air temperature, window blinds, and music selection/volume can all be adjusted by most patients.	10.7%	46.4%	3.6%	19.6%	5.4%	14.3%	2.56	1.17
Different treatment areas (ex. lounge, exam room, quiet area) exist to allow patients in crisis to self-select their preferred treatment area.	10.7%	35.7%	41.1%	7.1%	0.0%	5.4%	2.47	0.80
Controls of air temperature, window blinds, music selection/volume are easy and intuitive to be used by patients.	12.5%	44.6%	5.4%	23.2%	0.0%	14.3%	2.46	1.05
Indoor plants, outside nature, artwork, or other pleasant stimuli are visible to most patients.	19.6%	35.7%	14.3%	8.9%	8.9%	12.5%	2.45	1.24
Controls of air temperature, window blinds, music selection/volume are within reach of most patients.	19.6%	23.2%	30.4%	12.5%	0.0%	14.3%	2.42	1.01
The exam rooms and other patient-staff interaction spaces are grouped in clusters or a pod design to help segregate behavioral health patients from the general ED population.	5.4%	48.2%	17.9%	8.9%	0.0%	19.6%	2.38	0.78
High-quality home-like or natural materials are used as interior finishes, creating a non-institutional ambiance for patients and families.	14.3%	33.9%	21.4%	8.9%	0.0%	21.4%	2.32	0.91

Table 10 (continued)

Design Feature	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Not Applicable/ No Answer	Mean	Std. Dev.
Windows and/or skylights provide plenty of direct or indirect natural light into areas in which behavioral health patients are treated.	30.4%	37.5%	16.1%	5.4%	0.0%	10.7%	1.96	0.88
Video monitoring system provides continuous coverage over all public areas and behavioral treatment spaces without blind spots.	46.4%	23.2%	10.7%	5.4%	0.0%	14.3%	1.71	0.92

As shown in Table 11, on average respondents from Nacogdoches Memorial Health provided the most positive feedback regarding the design features in place within their existing ED which could contribute to taking care of behavioral health patients (M = 94.00, SD = 18.30). Woodland Heights Medical Center (M = 84.25, SD = 9.56) and Nacogdoches Medical Center (M = 84.20, SD = 13.33) received the second and third highest number of positively rated comments, respectively. While mean differences existed across all facilities, the results were not statistically significant (F = 1.518, df = 2 and 26, p=.238).

Table 11

Patient-Clinician Interaction Space Response Scores by Facility

Total Design Features Score	Facility Name	N	Mean	Std. Dev.	Std. Error Mean
	Woodland Heights Medical Center	8	84.25	9.56	3.38
	Nacogdoches Memorial Health	11	94.00	18.30	5.52
	Nacogdoches Medical Center	10	84.20	13.33	4.22

Respondents with 1-5 years of work experience with current employer on average (Table 12) provided the most positive feedback regarding the design features in place within their existing ED which could contribute to taking care of behavioral health patients (M = 94.50, SD = 14.89). Respondents with the most experience working in the existing ED (16-20 years) provided less positive responses on average than all other respondent groups (M = 80.00, SD = 0.00). While mean response differences existed among participants, the results were not statistically significant (F = 1.944, df = 3 and 25, p = 0.148).

Table 12

Patient-Clinician Space Cumulative Response Scores by Tenure with Current Employer

Years with current employer	Mean	N	Std. Dev.
Less than 1 year	82.00	4	17.32
1-5 years	94.50	14	14.89
6-10 years	82.38	8	13.52
11-15 years	n/a	0	n/a
16-20 years	80.00	3	0.00
Total	87.93	29	14.93

Respondents with 1-5 years of work experience as an ED nurse (Table 13) on average provided the most positive feedback regarding the design features in place within their existing ED which could contribute to taking care of behavioral health patients (M = 101.00, SD = 15.75). Respondents with the most experience working in the existing ED (16-20 years) provided less positive responses on average than all other respondent groups (M = 87.75, SD = 15.17). Mean response differences among all participants were statistically significant (F = 4.036, df = 4 and 23, p = 0.013).

Table 13

Patient-Clinician Space Cumulative Response Scores by Career Tenure

Years as an ED Nurse	Mean	N	Std. Dev.
Less than 1 year	97.00	2	.00
1-5 years	101.00	8	15.75
6-10 years	81.56	16	11.30
11-15 years	80.00	1	.00
16-20 years	70.00	1	.00
Total	87.75	28	15.17

On average, male respondents provided more positive feedback regarding the overall nature of their existing ED (M = 92.18, SD = 21.52) compared to their female counterparts (M = 85.08, SD = 8.91) as reflected in Table 14. While male responses were overall more positive, their feedback exhibited a lot more variability than female responses. While mean differences existed between the

male and female gender, the results were not statistically significant (F = 1.494, df = 1 and 26, p=.233). Based on these results, the data did not support the hypothesis that evaluation of the existing ED environment varies by gender.

Table 14

Patient-Clinician Space Cumulative Response Scores by Gender

	Gender	N	Mean	Std. Dev.	Std. Error Mean
Total Design Features Score	Male	11	92.18	21.52	6.49
	Female	17	85.06	8.91	2.16

On average, male survey participants *favored* the following five statements in the Patient-Clinician Interaction Space section of the survey, with the mean response scoring between “Neither Agree or Disagree” and “Agree” (Table 15):

- Solid doors and walls, curtains, and window blinds prevent patients in rooms from being seen from outside the rooms (M = 3.60, SD = 1.06).
- Staff members are able to provide constant observation of patients without risking their own safety (M = 3.67, SD = 0.62).
- Curtains and other visual barriers prevent patient-sensitive information from being viewed by other patients or staff (M = 4.00, SD = 0.38).
- Nursing staff members have a clear view of interaction spaces and corridors from the nursing station(s) (M = 3.50, SD = 1.15).

- Plenty of seating is available for patients and their family members (M = 3.44, SD = 1.10).

Female participants *favored* the following five statements in the Patient-Clinician Interaction space survey with the mean response scoring between "Neither Agree or Disagree" and "Agree" (Table 15):

- Curtains and other visual barriers prevent patient-sensitive information from being viewed by other patients or staff (M = 3.31, SD = 0.99).
- The exam rooms and other patient-staff interaction spaces are grouped in clusters, or a pod design is used to make it easy to monitor and reach individual interaction spaces (M = 3.18, SD = 0.95).
- The treatment area is staffed with clinical professionals who can treat patients when needed (M = 3.21, SD = 0.95).
- Nursing station is open, providing a minimal barrier between patients and staff (M = 3.43, SD = 0.78).
- Patients have easy access to magazines, information booklets, TV, or internet (M = 3.13, SD = 1.11).

Of responses received, significant differences existed between male and female responses observed in the following statements:

- Curtains and other visual barriers prevent patient-sensitive information from being viewed by other patients or staff (t = 3.53, df = 47.65, p = .000).

- Furniture is not easily moved or manipulated to cause harm (t = 1.27, df = 24.54, p = .006).
- Video monitoring system provides continuous coverage over all public areas and behavioral treatment spaces without blind spots (t = 0.94, df = 19.25, p = .000).

Table 15

Summary of Responses to Patient-Clinician Interaction Space Questions by Gender

	Gender	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	N	Mean	Std. Dev.
Solid doors and walls sufficiently prevent the conversations in one room from being overheard by other patients in neighboring rooms/corridors.	Male	0.0%	53.3%	0.0%	46.7%	0.0%	15	2.93	1.03
	Female	5.6%	41.7%	22.2%	27.8%	2.8%	36	2.81	1.01
Solid doors and walls, curtains, and window blinds prevent patients in rooms from being seen from outside the rooms.	Male	6.7%	13.3%	0.0%	73.3%	6.7%	15	3.60	1.06
	Female	14.7%	20.6%	11.8%	47.1%	5.9%	34	3.09	1.24
Staff are able to provide constant observation of patients without risking their own safety.	Male	0.0%	6.7%	20.0%	73.3%	0.0%	15	3.67	.62
	Female	2.9%	20.0%	37.1%	37.1%	2.9%	35	3.17	.89
Curtains and other visual barriers prevent patient-sensitive information from being viewed by other patients or staff.	Male	0.0%	0.0%	6.7%	86.7%	6.7%	15	4.00	.38
	Female	0.0%	31.4%	11.4%	51.4%	5.7%	35	3.31	.99
The exam rooms and other patient-staff interaction spaces are grouped in clusters, or a pod design is used to make the layout easier to understand.	Male	18.8%	25.0%	43.8%	12.5%	0.0%	16	2.50	.97
	Female	7.1%	21.4%	28.6%	42.9%	0.0%	28	3.07	.98
The exam rooms and other patient-staff interaction spaces are grouped in clusters or a pod design is used to make it easy to monitor and reach individual interaction spaces.	Male	18.8%	31.3%	25.0%	25.0%	0.0%	16	2.56	1.09
	Female	7.1%	14.3%	32.1%	46.4%	0.0%	28	3.18	.95

Table 15 (continued)

	Gender	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	N	Mean	Std. Dev.
The exam rooms and other patient-staff interaction spaces are grouped in clusters, or a pod design to help segregate behavioral health patients from the general ED population.	Male	6.3%	56.3%	25.0%	12.5%	0.0%	16	2.44	.81
	Female	7.1%	60.7%	21.4%	10.7%	0.0%	28	2.36	.78
There are dedicated behavioral health treatment rooms within each pod.	Male	6.3%	37.5%	37.5%	18.8%	0.0%	16	2.69	.87
	Female	21.4%	10.7%	50.0%	17.9%	0.0%	28	2.64	1.03
Exam rooms are equipped with mechanisms that can be used to hide room features as needed to protect behavioral health patients in the room.	Male	16.7%	50.0%	0.0%	22.2%	11.1%	18	2.61	1.34
	Female	7.1%	42.9%	25.0%	25.0%	0.0%	28	2.68	.95
Sound-absorbing ceiling tiles and other noise-reduction measures are used so that the rooms and corridors are quiet.	Male	0.0%	53.8%	38.5%	7.7%	0.0%	13	2.54	.66
	Female	4.0%	28.0%	40.0%	28.0%	0.0%	25	2.92	.86
The noise level in rooms does not interfere with communications between patient and staff, and between staff and members.	Male	0.0%	46.2%	30.8%	23.1%	0.0%	13	2.77	.83
	Female	0.0%	44.0%	28.0%	24.0%	4.0%	25	2.88	.93
High-quality home-like or natural materials were used as interior finishes, creating a non-institutional ambiance for patients and families.	Male	15.4%	53.8%	7.7%	23.1%	0.0%	13	2.38	1.04
	Female	20.0%	36.7%	36.7%	6.7%	0.0%	30	2.30	.88
Plenty of seating is available for patients and their family members.	Male	11.1%	11.1%	0.0%	77.8%	0.0%	18	3.44	1.10
	Female	0.0%	40.7%	14.8%	40.7%	3.7%	27	3.07	1.00
Large rooms are available to accommodate patients accompanied by a large group of family members.	Male	16.7%	5.6%	50.0%	27.8%	0.0%	18	2.89	1.02
	Female	0.0%	48.1%	33.3%	18.5%	0.0%	27	2.70	.78
Different treatment areas exist to allow patients in crisis to self-select their preferred treatment area.	Male	5.6%	38.9%	50.0%	5.6%	0.0%	18	2.56	.71
	Female	14.7%	35.3%	41.2%	8.8%	0.0%	34	2.44	.86
The treatment area is staffed with clinical professionals who can treat patients when needed.	Male	0.0%	12.5%	37.5%	50.0%	0.0%	16	3.38	.72
	Female	0.0%	32.4%	17.6%	47.1%	2.9%	34	3.21	.95
Staff are co-located with patients.	Male	0.0%	12.5%	37.5%	50.0%	0.0%	16	3.38	.72
	Female	5.9%	14.7%	44.1%	32.4%	2.9%	34	3.12	.91

Table 15 (continued)

	Gender	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	N	Mean	Std. Dev.
Furniture is comfortable to use for the majority of patients.	Male	5.6%	44.4%	33.3%	16.7%	0.0%	18	2.61	.85
	Female	12.9%	22.6%	38.7%	22.6%	3.2%	31	2.81	1.05
Furniture is not easily moved or manipulated to cause harm.	Male	16.7%	27.8%	16.7%	27.8%	11.1%	18	2.89	1.32
	Female	9.7%	45.2%	35.5%	9.7%	0.0%	31	2.45	.81
Indoor plants, outside nature, artwork, or other pleasant stimuli are visible for most patients.	Male	11.1%	38.9%	22.2%	0.0%	27.8%	18	2.94	1.43
	Female	30.0%	40.0%	13.3%	16.7%	0.0%	30	2.17	1.05
Patients have easy access to magazines, information booklets, TV, or internet.	Male	11.1%	38.9%	16.7%	16.7%	16.7%	18	2.89	1.32
	Female	3.3%	30.0%	30.0%	23.3%	13.3%	30	3.13	1.11
Windows and/or skylight provide plenty of direct or indirect natural light into areas in which behavioral health patients are treated.	Male	16.7%	44.4%	22.2%	16.7%	16.7%	18	2.39	.98
	Female	45.2%	38.7%	16.1%	0.0%	45.2%	31	1.71	.74
Air conditioning temperature, window blinds, and music can all be adjusted by most patients.	Male	6.3%	56.3%	12.5%	6.3%	18.8%	16	2.75	1.29
	Female	16.1%	51.6%	0.0%	32.3%	0.0%	31	2.48	1.12
Controls of air conditioning temperature, window blinds, music are within reach of most patients.	Male	12.5%	31.3%	37.5%	18.8%	100.0%	16	2.63	.96
	Female	29.0%	22.6%	35.5%	12.9%	100.0%	31	2.32	1.05
Controls of air conditioning temperature, window blinds, music are easy and intuitive to be used by patients.	Male	6.3%	43.8%	12.5%	37.5%	100.0%	16	2.81	1.05
	Female	19.4%	54.8%	3.2%	22.6%	100.0%	31	2.29	1.04
The nursing station is located centrally, providing visibility to the status of interaction spaces and reducing staff traveling.	Male	12.5%	18.8%	31.3%	18.8%	18.8%	16	3.13	1.31
	Female	30.6%	13.9%	13.9%	30.6%	11.1%	36	2.78	1.46
The decentralized nursing station is located close to interaction spaces, providing visibility to the interaction spaces and reducing staff traveling.	Male	11.1%	27.8%	16.7%	44.4%	11.1%	18	2.94	1.11
	Female	14.8%	33.3%	22.2%	29.6%	14.8%	27	2.67	1.07
Nursing staff members have a clear view of interaction spaces and corridors from the nursing station(s).	Male	5.6%	22.2%	0.0%	61.1%	11.1%	18	3.50	1.15
	Female	8.6%	34.3%	5.7%	51.4%	0.0%	35	3.00	1.11

Table 15 (continued)

	Gender	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	N	Mean	Std. Dev.
Nursing station is open, providing a minimal barrier between patients and staff.	Male	5.6%	16.7%	50.0%	27.8%	0.0%	18	3.00	.84
	Female	0.0%	14.3%	31.4%	51.4%	2.9%	35	3.43	.78
I feel safe in the nurse station when caring for behavioral health patients.	Male	0.0%	33.3%	38.9%	27.8%	100.0%	18	2.94	.80
	Female	2.9%	31.4%	20.0%	45.7%	100.0%	35	3.09	.95
Video monitoring system provides continuous coverage over all public areas and behavioral treatment spaces without blind spots.	Male	62.5%	0.0%	18.8%	18.8%	0.0%	16	1.94	1.29
	Female	48.4%	41.9%	9.7%	0.0%	0.0%	31	1.61	.67

Current healthcare design solutions. When asked what additional design features should be incorporated into their existing ED to help manage behavioral health patients more effectively, designated treatment areas and enhanced security were cited as common themes. Appendix D provides additional information on open-ended survey responses.

The presence of designated treatment areas with “privacy for patients in crisis” was suggested by survey respondents. Responses proposed that these rooms be located in a “quiet environment [that] ...still allows for safety” with access to natural light. There should be enough behavioral health rooms to meet the needs of the population served, located “away from the general ER population.”

Enhanced security was also suggested as a mechanism to increase the staff's ability to care for patients. In addition to having access to more patient sitters to help monitor patients throughout their ED visit, staff suggested "video surveillance" as well as "security staffed at a position of patient entry to the ER lobby and treatment areas" to help staff quickly deescalate challenging situations.

Conclusion

When evaluating their current ED, survey respondents across all facilities believed that the environment and culture were supportive of teamwork and collaboration between staff while working. The presence of safety measures to provide staff with a sense of safety while in the ED was something identified across all facilities that could be enhanced, especially to support the care of behavioral health patients while in the department. Staff with less work experience, on average, provided higher ratings of the existing ED environment and the design features available to help manage behavioral health patients. Staff with more work experience provided lower ratings of the existing ED environment. Visual barriers and attractive/inviting colors/materials were identified by respondents across all surveyed facilities as being present in their existing EDs. Alternatively, daylight and patient control of window blinds, air conditioning, etc. were identified across all facilities as being absent in their existing ED environment. While mean differences were identified between

responses provided by male and female respondents, the results were not significant.

Looking ahead to their desired future state, staff would like to incorporate designated treatment areas for behavioral health patients into their existing ED to provide a safe place for care administration. In addition, an increased security presence within their existing EDs was suggested to enhance both patient and staff safety.

CHAPTER 5

Discussion

As the stigma surrounding behavioral health has started to decrease (Oelrich, 2017), treatment of these conditions across the country has become more prevalent. Similarly, as demand for increased access to behavioral health services increases, the need for healthcare organizations to be able to treat a more varied patient type has also emerged. Facilities must now balance the safety of patients, staff, and visitors with a healing environment that treats an even more vulnerable population (Black, 2017).

The purpose of this study was to examine key design features implemented in three rural Emergency Departments (EDs) in eastern Texas and evaluate their efficacy in managing behavioral health patients throughout their course of treatment. This study focused on three major areas that may contribute to behavioral health patient care in the ED: furniture and fixture solutions, spatial configurations (i.e. designated holding areas, treatment areas), and environmental features and controls. Data were collected via paper-based surveys; a total of 56 responses were received across all surveyed sites. Survey respondents were asked to complete the survey which contained simple demographic questions as well as a number of Likert-scale items. These items requested their opinions on their current ED and the existing design features in

place to help them better care for behavioral health patients throughout their course of treatment.

Limitations

The goal of the study was to have nursing staff at each site across all shifts participate in the survey. The majority of respondents who completed the survey were full-time staff, with approximately two-thirds of respondents working the day shift. Due to the inability for the researcher to be present during all shifts to administer the survey and garner participation from nursing staff, the researcher had to rely on word of mouth and guidance provided by hospital leadership to encourage respondents to complete the survey. In addition, because the survey was not clearly labeled to suggest that only nursing staff should participate, coupled with the researcher's inability to be present during administration, there is a chance that the survey was completed by non-nursing staff, causing the data collected to be skewed.

Within the design features section of the survey, it is likely that the data collected were an underrepresentation of possible data which could have been received. It is possible that other respondents overlooked the survey instructions provided for that section and the response box for indicating the presence of a particular design feature.

Results of the survey indicated inconsistent identification of design features present in the ED within the same organization. Some respondents at

one hospital checked an element as being present, whereas other respondents from the same organization did not. While the researcher coded these responses according to an absolute measurement (Yes or No), the researcher suggests there might be an opportunity to provide staff training around the different design features present in the ED to ensure the entire care team is aware of what resources are available to enhance safety for patients and staff in the department.

Hypothesis Findings

The study yielded a relatively large sample size of 56 participants across three hospitals. The following hypotheses yielded notable results in evaluation of the ED environment or design features.

Issues presented from holding behavioral health patients in the ED. Due to operational and capacity challenges associated with finding inpatient behavioral health bed placement for patients who present to the ED, all surveyed facilities were challenged with boarding behavioral health patients. A number of issues cited by respondents occurred when holding behavioral health patients in the ED environment for extended periods of time.

Feedback from respondents on the overall state of their EDs were generally positive when talking about the environment's support of team work and collaboration. The feedback regarding the environment's support of staff while caring for behavioral health patients, however, was less favorable. While

the researcher was encouraged by the staff's ability to work together to provide patient care, the inability to treat the behavioral health patients safely who walk into the ED was also a concern and a potential source of stress for both staff and patients. Behavioral health patients typically perform better in calmer settings (Zeller, 2017); however, this question received the lowest score based on respondent feedback. While design practices have trended toward implementation of a designated treatment area for behavioral health patients, all three facilities reported having insufficient space available to accommodate patients throughout their care. This problem makes designating any treatment space for one patient population versus another a challenge from a staffing and space perspective.

Responses collected on the overall condition of the existing ED yielded the most positive results from individuals with 11-15 years of work experience at their current employer. Individuals with one to five years of experience at their respective hospitals yielded the most negative results. The researcher speculates this difference could be due to the short amount of experience worked at the respondents' respective organizations as well as their limited exposure to different EDs. Staff with more years of experience have grown accustomed to their existing work environment and have gained a level of comfort in the day-to-day operations. Staff with less experience (or who may have worked elsewhere)

may be struggling to reconcile the current state with experiences they had in the EDs of other organizations.

Interestingly, staff members with less than one year of work experience throughout their career responded to questions regarding the overall condition of the existing ED most positively, reflecting the highest cumulative score. Again, individuals with one to five years of total work experience (regardless of previous organizations) yielded the most negative results. The researcher speculates this difference could be due to the more positive outlook had by newly graduated professionals entering into the career versus those who have more experience and have had more time to adjust to their surroundings and evaluate the existing environment through the lens of their greater experience.

Across all facilities surveyed, the mean differences of the cumulative scores identified across all sites were not significant. While respondents from Nacogdoches Medical Center yielded the highest cumulative mean, responses from Nacogdoches Memorial Health and Woodland Heights Medical Center were not significantly different despite their geographical locations and patient populations served.

The mean differences of the cumulative scores identified across both male and female genders were not significant. While female respondents yielded a higher cumulative mean, this result was not significantly different than responses received from the males. Male and female ED participants shared similar

perceptions about their work environment and its ability to support the treatment of behavioral health patients.

Current methods utilized to manage behavioral health patients in the ED. Of the design features identified, visual barriers, attractive/inviting colors/ materials, and audio barriers were reported as present in at least half of the survey responses. When comparing across facilities a higher percentage of respondents reported the presence of visual and audio barriers at Nacogdoches Memorial Health, leading the researcher to believe that these design elements are either more readily available or heavily used at this site compared to others surveyed. Feedback from respondents on the efficacy of design solutions available (i.e. individual statements which received the highest mean score) in their EDs to help manage behavioral health patients overall were generally positive when talking about the departmental staffing and collaboration, having an open layout to increase visibility within the department, and the presence of design elements that could be moved/manipulated easily (i.e., curtains, blinds) by staff to help provide privacy to patients during care. These are careful considerations when caring for behavioral health patients, as the department should be staffed appropriately to help manage the patients entering while also providing clear lines of sight to all staff throughout the department to encourage teamwork and allow visibility in cases where help is needed should an incident arise. While less than half of staff across all sites recognized a designated

treatment area for behavioral health patients within the ED, design features like curtains and blinds as well as general exam rooms with solid doors and walls were cited as available to provide privacy and a bit of seclusion throughout patient care. The researcher notes that while sound barriers were identified by respondents, it is unclear how effective they are in controlling sound within the ED due to the variety of responses provided regarding noise levels. While some questions regarding sound levels being appropriate for patient care were ranked high (Agree to Strongly Agree rating), other questions regarding noise levels in rooms interfering with departmental communication and the presence of sound-absorbing ceiling tiles and other noise reduction measures received low ratings (Strongly Disagree to Disagree). Many evaluation questions regarding noise also received a “Neither Agree or Disagree” response, making it difficult to understand sentiment one way or the other on efficacy of sound barriers deployed.

Patient control of window blinds, air conditioning, etc., and daylight were design features reported as being absent from the overall ED environment at all facilities surveyed. Feedback from respondents on the least effective design solutions (either missing or not widely utilized) in their EDs to help manage behavioral health patients overall noted minimal home-like or natural-looking interior finishes, a lack of natural light, and no clusters/pods to designate for behavioral health patients to help segregate them from the general population seen in the ED. Also missing from the ED environment were elements of patient

environment control (air temperature, window blinds, music selection/volume) within reach of patients to allow them to adjust their immediate surroundings during care. These findings were not surprising to the researcher as all three EDs surveyed were located on the interior of the facility (with no access to windows) and had not been recently renovated to provide the more patient-centric features.

Interestingly, at their current employer and throughout their career tenure, staff with one to five years of work experience responded to questions regarding the overall condition of the existing ED most positively, reflecting the highest cumulative score. Individuals with 16-20 years of total work experience (regardless of previous organizations) yielded the most negative results. The researcher speculates this difference could be due to the more positive outlook held by younger professionals who are developing their career skills and becoming more familiar with the ED versus those who have more experience and have had more time to adjust to their surroundings and evaluate the existing environment through the lens of more experience. Those with more experience are more likely to have tried numerous design solutions when caring for behavioral health patients and are more equipped to reflect on their efficacy. The researcher recommends that organizational leadership follow up with the more experienced staff to understand and allay their concerns with the existing ED environment.

Across all facilities surveyed, the mean differences of the cumulative scores identified across all sites were not significant. While respondents from Nacogdoches Memorial Health yielded the highest cumulative mean providing higher scores for individual criteria, responses from Nacogdoches Medical Center and Woodland Heights Medical Center were not significantly different despite their geographical locations and patient populations served.

In assessing design solutions currently available in the ED to help manage behavioral health patients, the mean differences of the cumulative scores identified across both male and female genders were not significant. While male respondents yielded a higher cumulative mean and on average scored the design features higher, this result was not significantly different than responses received from the females.

Current healthcare design solutions. When asked to describe dangerous and/or stressful encounters had in the ED while caring for behavioral health patients, respondents cited a number of incidents where they believed the patient was a danger to themselves and others while providing care in the department. One respondent said she was grabbed by the arm while attempting to take vitals in the exam room; a second cited several aggressive and delusional patients who had come to the ED to receive care, one of which brought in a gun.

When asked what design features staff would like to incorporate into their existing ED to assist with the management of behavioral health patients, themes

and responses were consistent across all sites surveyed. Staff across all sites identified enhanced security and designated treatment areas within the ED for behavioral health patients as preferred solutions to help enhance patient care as well as staff and patient safety.

The researcher's understanding was that the EDs surveyed did not have a dedicated security guard stationed in the department for 24 hours per day seven days per week. Security guards instead performed rounds throughout the facility. Also, when asked to evaluate the video monitoring system and its ability to provide continuous coverage across public areas and behavioral health treatment areas, the majority of responses received an evaluation score between "Strongly Disagree" and "Disagree" ($M = 1.71$, $SD = 0.92$). The ability to have a constant security presence in the ED was perceived by some respondents to act not only as a deterrent to violent episodes by behavioral health patients but also act as a first-responder to assist with de-escalation as needed. It was unclear to the researcher whether respondents would have a better sense of security if the video monitoring solution were more robust within the ED and/or staff had direct communication with the security team on campus to contact them as needed.

Respondents surveyed also suggested a designated treatment area or single-occupancy safe room for behavioral health patients be implemented in their ED. This solution was cited as providing more privacy for patients and thought to allow staff to treat patients in a more dignified way, as well as

segregating behavioral health patients from the general ED population. It was unclear from the data which design solution (safe room or designated treatment area) was preferred.

Implications

Based on the feedback gathered, there are a number of items identified that organizations can implement to enhance the experience of behavioral health patient treatment within the ED. While the hospitals surveyed cannot immediately relocate their departments to an exterior wall to achieve greater natural light, the current lighting utilized within the ED can be reevaluated to identify a solution that provides better lighting within the department. One such solution could be to add additional lighting in ED treatment areas. To provide a more natural, home-like environment, departments should consider adding local, nature-themed artwork throughout the treatment areas as well as repainting certain areas of the hospital to refresh the treatment areas. If the mechanical and electrical systems would allow, hospitals can install thermostats in each patient room to provide the patients the ability to adjust the room temperature to enhance their level of comfort in the space.

Design solutions proposed by the staff to help better manage behavioral health patients present potential implementation challenges by the hospital leadership team. The addition of enhanced security measures (i.e. robust monitoring, dedicated staff within the department) requires a financial investment

by the organization as either a single or on-going expense. Adding a designated behavioral health treatment area and/or safe room also requires a significant financial investment, as it would require either reallocating existing space or building out new space and equipping it appropriately for patient care. Instead, organizations can consider designating a set or cluster of general exam rooms that can be utilized to treat behavioral health patients as needed. This solution allows all behavioral health patients to be located in one area of the department as opposed to distributed throughout the unit which could be beneficial from a staffing and security perspective. In addition, organizations can consider staffing psychiatric nurses and/or social workers in the ED at peak shifts to be readily available to assist with de-escalation efforts when patients are in crisis. If not able to implement all solutions proposed, the researcher recommends the organization of leaders consider the solutions that are most feasible for their facility for possible implementation.

Recommendations for Further Study

While this study provided insight into the opinions and perceptions of nursing staff members on their existing ED environment and their ability to care appropriately for behavioral health patients, the proposed solutions provide a number of benefits and challenges for their particular organizations to implement. The study was limited to three general hospitals in rural east Texas with survey participation from 56 nursing staff professionals. The researcher recommends

further studies be performed across multiple hospitals in different geographical environments (e.g., rural, suburban, urban) to garner more varied representation.

As the respondent pool for the study was limited to nursing staff within each ED, there was a large number of respondents who did not have an opportunity to participate in the survey. The researcher recommends a question be added to the demographic information section of the survey to allow participants to self-select their role (i.e., provider, nurse, medical assistant, tech, other) prior to taking the survey. Addition of this question would allow further research to assess the opinions of every staff member within the ED and compare results across multiple roles within the department.

Respondents offered differing responses to the design features questions, specifically when asked to identify whether or not a feature was provided in the ED environment. To provide clarity while taking the survey, the researcher proposes that identification of the presence of design features be moved to a separate section of the survey. Evaluation of perceived efficacy of design features to treat behavioral health patients can then be completed using the remaining questions in the design features section. In addition, the researcher recommends a general definition or graphical representation be added to the design feature identification section to provide respondents with a standard set of criteria against which to evaluate their decisions.

To increase the quantity of open-ended questions provided, the researcher suggests a survey reorganization. The open-ended questions could be hybridized to include a general section from pre-populated responses could be chosen as well as an open-ended section for respondents to expand upon their responses.

In appreciation for the participation of the three hospitals, the researcher provided a summary of the study findings to the leadership teams at each hospital. The researcher extended an offer to present findings in person should the team desire.

Conclusion

This research on design features available in EDs to help manage the behavioral health patient population has revealed that while some elements exist, EDs are not appropriately equipped or staffed to manage this vulnerable patient population. Due to challenges with placement of patients into inpatient behavioral health beds, holding patients within the ED environment was a regular occurrence in all EDs surveyed. Due to the physical location of the EDs within the hospital, many staff members noted that natural light and inviting, home-like features were missing from their department. In addition to these two elements, lack of designated treatment space for behavioral health patients and a designated security presence within the ED were also cited as points of concern.

Both of these solutions were identified as priority items for implementation in the future.

Due to the physical location of the EDs within the hospital as well as age of the facilities surveyed, the researcher was not surprised by the overall results of the data gathered. The most surprising result to the researcher was the lack of security presence within the ED environment to provide monitoring of the waiting area and assistance with de-escalation where possible. In addition, the number of “Neither Agree or Disagree” responses provided by the respondents to survey questions surprised the researcher. The researcher expected stronger, more polarizing opinions on what was currently working well and in need of improvement within the ED environment in support of patient care.

As demand for behavioral health treatment continues to rise throughout the country, Emergency Departments will continue to see more of this vulnerable patient population come through their doors for treatment. Based on the outcomes of this survey, if provided an opportunity to alter the existing ED to provide additional treatment space for the behavioral health population, healthcare leaders should consider implementing the proposed solutions within the department to enhance the treatment experience for both patients and staff. In addition, leaders should consider If the solutions were implemented effectively, they could help deescalate patients during their course of treatment and potentially help them be evaluated sooner in the process.

REFERENCES

Alakeson, V., Pande, N., & Ludwig, M. (2010, September). A Plan To Reduce Emergency Room 'Boarding' Of Psychiatric Patients. Retrieved from https://www.healthaffairs.org/doi/10.1377/hlthaff.2009.0336

Bazuin, D., & Hicks, C. (2014, August 07). Design recommendations for behavioral health outpatient facilities. Retrieved from https://www.behavioral.net/article/design-recommendations-behavioral-health-outpatient-facilities

Black, J. (2017, September 28). 3 Technology Features To Improve Behavioral Health Environments. Retrieved from https://www.healthcaredesignmagazine.com/trends/perspectives/3-technology-features-improve-behavioral-health-environments/?hilite=%27behavioral%27%2C%27health%27

Clinic Design Post-Occupancy Evaluation Toolkit. (2015). The Center for Health Design. Retrieved from https://www.healthdesign.org/clinic-design-post-occupancy-evaluation-toolkit-pdf-version

Community Mental Health Act. (n.d.). Retrieved from https://www.thenationalcouncil.org/about/national-mental-health-association/overview/community-mental-health-act/

County Profile: Nacogdoches County, Texas. (2015). Retrieved from http://www.healthdata.org/sites/default/files/files/county_profiles/US/2015/County_Report_Nacogdoches_County_Texas.pdf

Cox, A. (2018, October 4). Applying behavioral health design strategies to the ED environment. Retrieved from https://www.hfmmagazine.com/articles/3486-behavioral-health-design-strategies

Data on behavioral health in the United States. (n.d.). Retrieved from https://www.apa.org/helpcenter/data-behavioral-health

DiNardo, A. (2015, September 25). State Of Mind In Behavioral Healthcare Design. Retrieved from https://www.healthcaredesignmagazine.com/trends/architecture/state-mind-behavioral-healthcare-design/

Dzubak, J. (2017). Managing mental health emergencies in the ED. American Nurse Today,12(11). Retrieved from https://www.americannursetoday.com/managing-mental-health-emergencies-ed/.

Emergency department – Ellis Medicine. (2019). Retrieved from http://www.envisionarchitects.com/portfolio/healthcare/emergency-department-ellis/

Farentinos, C. (2017, November 10). A Multidisciplinary Model for Emergency Psychiatric Care. Retrieved from https://www.hhnmag.com/articles/8687-a-multidisciplinary-model-for-emergency-psychiatric-care

Finch R.A., &. Phillips K. (2005). Center for Prevention and Health Services. An Employer's Guide to Behavioral Health Services: A Roadmap and Recommendations for Evaluating, Designing, and Implementing Behavioral Health Services. Washington, DC: National Business Group on Health.

Halmer, T. C., & Tucci, V. T. (2016). Ch 23. Mental Health in the Emergency Department. In N. R. Schlicher & A. Haddock (Eds.), Advocacy Handbook (4th ed., pp. 129-136). Dallas, TX: Emergency Medicine Residents' Association.

Huff, C. (2018, May 02). Alarming suicide rate jolts East Texas 'Bible Belt' community into action. Retrieved from https://www.dallasnews.com/business/health-care/2018/05/02/alarming-suicide-rate-jolts-east-texas-bible-belt-community-action

Laderman, M., Dasgupta, A., Henderson, R., & Waghray, A. (2018, January 26). Tackling The Mental Health Crisis In Emergency Departments: Look Upstream For Solutions. Retrieved from https://www.healthaffairs.org/do/10.1377/hblog20180123.22248/full/

Levin-Epstein, M. (2015, November 18). Psych Units in the ED: Trend, Solution, or Neither? Retrieved from http://epmonthly.com/article/psych-units-in-the-ed-trend-solution-or-neither/

Mural, J. (2015, July 1). What's The Best Nurses' Station Design For Psychiatric Hospitals? Retrieved from https://www.healthcaredesignmagazine.com/projects/behavioral-health/what-s-best-nurses-station-design-psychiatric-hospitals/

Nitkin, K. (2018, October 19). Design Features Set Psychiatric Emergency Areas Apart. Retrieved from https://www.hopkinsmedicine.org/news/articles/the-design-features-that-set-psychiatric-emergency-areas-apart

Oelrich, T. (2017, March 22). It's Time to Design a Better Experience for Behavioral Health Patients. Retrieved from http://meanstheworld.co/well-being/its-time-to-design-a-better-experience-for-behavioral-health-patients

Oelrich, T., Rufe, A. (2016, November). *Behavioral health and the ED: Is collaborating together the best answer for "unclogging" Emergency Departments and providing the appropriate care to behavioral health patients?* Conference presentation presented at Healthcare Design, Houston, TX

Reem, S. (2017, February 1). Dignity in design for pediatric behavioral health facilities. Retrieved from https://www.hfmmagazine.com/articles/2682-designing-with-dignity

Sanders, R. (2017, January 27). 6 Behavioral Health Design Trends. Retrieved from https://www.healthcaredesignmagazine.com/trends/architecture/6-behavioral-health-design-trends/

Schwindel, S., WHR Architects, Inc. (2011, February 15). Ocean Medical Center windows/light literature review [Literature review].

Shepley, M., Watson, A., Pitts, F., Garrity, A., Spelman, E., Fronsman, A., & Kelkar, J. (2016). Mental and behavioral health environments: measurement of building performance. The Center for Health Design, Concord, CA.

Stroupe, J. (2019). Designing the future of integrated behavioral health [White paper]. Retrieved from Steelcase Inc.

Tavernero, T. (2015, December 2). Addressing Psychiatric Boarding in the Emergency Department [White Paper]. TeamHealth, Knoxville, TN.

Thorsen, K. (2018, July 11). 5 ways design is transforming behavioral healthcare. Retrieved from https://www.bdcnetwork.com/5-ways-design-transforming-behavioral-healthcare

Turner, K. (2015, January 5). Designing for Health: Challenges and Opportunities in Psychiatric Healthcare Design. Retrieved from

https://www.contractdesign.com/practice/healthcare/designing-for-health-challenges-and-opportunities-in-psychiatric-healthcare-design/

WHR Architects, Inc. (2014). Emergency Department. [Architectural drawing].

WHR Architects, Inc. (2016, October 16). Option 1. (SD101.E Floor Plan Level 1 – Area E). [Architectural drawing].

Zeller, S. (2017, September 7). EmPATH Units as a Solution for ED Psychiatric Patient Boarding. Psychiatry Advisor. Retrieved from https://www.psychiatryadvisor.com/home/practice-management/empath-units-as-a-solution-for-ed-psychiatric-patient-boarding/

Zeller, S. (2018, August 16). What Psychiatrists Need to Know: Patients in the Emergency Department. Psychiatric Times. Retrieved from https://www.psychiatrictimes.com/psychiatric-emergencies/what-psychiatrists-need-know-patients-emergency-department

APPENDICES

APPENDIX A

Definition of Terms

APPENDIX A

Definition of Terms

Behavioral Health. “an umbrella term…refers to a continuum of services for individuals at risk of, or suffering from, mental, behavioral, or addictive disorders” (Finch & Phillips, 2005)

Boarding. Time spent waiting in an emergency room for a hospital bed or for transfer to another inpatient facility (Alakeson, Pande, & Ludwig, 2010)

Ligature Resistance. “Without points where a cord, rope, bed sheet, or other fabric/material can be looped or tied to create a sustainable point of attachment that may result in self-harm or loss of life” (Cox, 2018)

Psychiatric Boarding. Psychiatric patients’ waiting in hallways or other emergency room areas for inpatient beds (Alakeson, Pande, & Ludwig, 2010)

APPENDIX B

Research Survey Tool

EMERGENCY DEPARTMENT DESIGN STAFF SURVEY (PART 1)

This questionnaire asks questions about your perception of the work environment and your work experience in the Emergency Department (ED). Please mark the circle that most closely represents your level of agreement with each statement below. We are interested in your honest opinions, whether they are negative or positive. If you have comments about any one statement, please provide the comments in the spaces below the statement or on the back. Thank you in advance for your time and opinions.

Emergency Department Environment							
		Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Don't Know Not Applicable
1	The ED environment provides a sense of privacy for patients.	○	○	○	○	○	DK / NA
2	The ED environment makes it easy for private conversations with patients.	○	○	○	○	○	DK / NA
3	Exam room location/design provides privacy and confidentiality.	○	○	○	○	○	DK / NA
4	The physical environment of exam rooms allows easy communication with patients.	○	○	○	○	○	DK / NA
5	I have a clear view of patients and the computer screen in the exam room or other procedure rooms.	○	○	○	○	○	DK / NA
6	The noise level in the ED does not interfere with communication with patients.	○	○	○	○	○	DK / NA
7	The ED environment facilitates communication and teamwork among staff.	○	○	○	○	○	DK / NA
8	The ED environment makes it easy to know other staff members' status.	○	○	○	○	○	DK / NA
9	The ED environment encourages an emphasis on infection prevention.	○	○	○	○	○	DK / NA
10	The ED environment helps patients feel relaxed.	○	○	○	○	○	DK / NA
11	Our staff work area has pleasant features.	○	○	○	○	○	DK / NA
12	The ED clinical treatment area has a pleasing look.	○	○	○	○	○	DK / NA
13	The noise level is appropriate.	○	○	○	○	○	DK / NA
14	The ED feels bright inside.	○	○	○	○	○	DK / NA
15	The ED atmosphere is tense and stressful for staff.	○	○	○	○	○	DK / NA
16	The ED atmosphere is tense and stressful for patients.	○	○	○	○	○	DK / NA
17	The ED environment is depressing.	○	○	○	○	○	DK / NA
18	The ED environment allows me to quickly locate equipment, patients, and other staff.	○	○	○	○	○	DK / NA
19	Supplies are conveniently located.	○	○	○	○	○	DK / NA
20	The floor plan of the ED makes it easy for staff members to find what they need.	○	○	○	○	○	DK / NA
21	Sufficient spaces are available to accommodate patients in various stages of ED visit (check-in, waiting, exam room, etc.)	○	○	○	○	○	DK / NA
22	Design features (for example, lighting control) in treatment areas help reduce energy consumption.	○	○	○	○	○	DK / NA
23	Design features (for example, lighting control) in treatment areas can be controlled by patients.	○	○	○	○	○	DK / NA
24	Design features (for example, lighting and temperature control) in the ED help reduce stress for patients.	○	○	○	○	○	DK / NA

25	The ED provides a calming, supportive environment for behavioral health patients.	○	○	○	○	○	DK / NA
26	Design features provide a safe environment for staff to administer care.	○	○	○	○	○	DK / NA
27	The ED environment makes me feel safe and secure.	○	○	○	○	○	DK / NA
28	Design features are durable enough to withstand high amounts of wear.	○	○	○	○	○	DK / NA
29	Design features minimize a patient's ability to do harm to themselves or others.	○	○	○	○	○	DK / NA
30	Overall, I am satisfied with the physical environment of this ED in supporting my work with behavioral health patients.	○	○	○	○	○	DK / NA

Work Experience

1	There is a lot of teamwork among the staff.	○	○	○	○	○	DK / NA
2	The staff members generally cooperate with each other.	○	○	○	○	○	DK / NA
3	I have often felt nervous as a result of my job.	○	○	○	○	○	DK / NA
4	My job bothers me more than it should.	○	○	○	○	○	DK / NA
5	Sometimes when I think about my job I get a tight feeling in my chest.	○	○	○	○	○	DK / NA
6	This job lives up to my expectations.	○	○	○	○	○	DK / NA
7	Knowing what I know now, I would apply for this job again.	○	○	○	○	○	DK / NA
8	The job does not negatively affect my health.	○	○	○	○	○	DK / NA
9	I feel safe while caring for behavioral health patients.	○	○	○	○	○	DK / NA

Demographic Information

This group of questions is for comparison purpose only. Please mark or write down the responses.

1.	What is your gender?	○ Male ○ Female ○ Other					
2.	How long have you been working with your current employer?	○ Less than 1 year	○ 1-5 years	○ 6-10 years	○ 11-15 years	○ 15-20 years	○ 20 or more years
3.	How long have you been working in the Emergency Department as a nursing professional?	○ Less than 1 year	○ 1-5 years	○ 6-10 years	○ 11-15 years	○ 15-20 years	○ 20 or more years
4.	What is your employment status?	○ Full-time ○ Part-time ○ Other					
5.	What shift do you work most often?	○ Day Shift ○ Night Shift ○ Other _____					

Please explain any stressful or dangerous issues that have occurred during the treatment of behavioral health patients in your ED.

What additional design features should be incorporated into your existing ED to help manage behavioral health patients more effectively?

EMERGENCY DEPARTMENT DESIGN STAFF SURVEY (PART 2)

Patient-Clinician Interaction Spaces

Instructions: Below is a list of design features in patient-clinician interaction spaces (exam, consultation, procedure). One or several criteria can be found under each design feature. Please walk through all patient-clinician interaction spaces in which behavioral health patients are treated and verify if the feature is implemented in your ED.

If the design feature is implemented, please check the box next to the design feature and then assess how do you agree or disagree that the design feature has met the criterion/criteria to support the design principle(s). If the design principle was not implemented, leave the box next to it blank and move to the next design feature.

#	Design Feature	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Not Applicable
1	Audio barriers ☐ Check box if design feature implemented						
	Doors and walls sufficiently prevent the conversations in one room from being overheard by other patients in neighboring rooms/corridors.	○	○	○	○	○	○
2	Visual barriers ☐ Check box if design feature implemented						
	Solid doors and walls, curtains, and window blinds prevent patients in rooms from being seen from outside the rooms.	○	○	○	○	○	○
	Staff members are able to provide constant observation of patients without risking their own safety.	○	○	○	○	○	○
	Curtains and other visual barriers prevent patient-sensitive information (such as measurements of weight) from being viewed by other patients or staff.	○	○	○	○	○	○
3	Pod/design cluster ☐ Check box if design feature implemented						
	The exam rooms and other patient-staff interaction spaces are grouped in clusters, or a pod design is used to make the layout easier to understand.	○	○	○	○	○	○
	The exam rooms and other patient-staff interaction spaces are grouped in clusters, or a pod design is used to make it easy to monitor and reach individual interaction spaces.	○	○	○	○	○	○
	The exam rooms and other patient-staff interaction spaces are grouped in clusters or a pod design to help segregate behavioral health patients from the general ED population.	○	○	○	○	○	○
	There are dedicated behavioral health treatment rooms within each pod.	○	○	○	○	○	○
	Exam rooms are equipped with mechanisms (ex. metal "garage door") that can be used to hide room features as needed to protect behavioral health patients in the room.	○	○	○	○	○	○
4	Noise reduction measures ☐ Check box if design feature implemented						
	Sound-absorbing ceiling tiles and other noise-reduction measures are used so that the rooms and corridors are quiet.	○	○	○	○	○	○
	The noise level in rooms does not interfere with communications between patient and staff, and between staff and members.	○	○	○	○	○	○
5	Attractive/inviting colors/materials ☐ Check box if design feature implemented						
	High-quality home-like or natural materials are used as interior finishes, creating a non-institutional ambiance for patients and families.	○	○	○	○	○	○
6	Size/layout to accommodate different patient/family groups ☐ Check box if design feature implemented						
	Plenty of seating is available for patients and their family members.	○	○	○	○	○	○
	Large rooms are available to accommodate patients accompanied by a large group of family members.	○	○	○	○	○	○

7	Designated treatment area for behavioral patients ☐ Check box if design feature implemented						
	Different treatment areas (ex. lounge, exam room, quiet area) exist to allow patients in crisis to self-select their preferred treatment area.	○	○	○	○	○	○
	The treatment area is staffed with clinical professionals who can treat patients when needed.	○	○	○	○	○	○
	Staff member work areas are located with patient treatment spaces	○	○	○	○	○	○
8	Comfortable furniture ☐ Check box if design feature implemented						
	Furniture is comfortable to use for the majority of patients.	○	○	○	○	○	○
	Furniture cannot be easily moved or manipulated to cause harm.	○	○	○	○	○	○
9	Positive distractions ☐ Check box if design feature implemented						
	Indoor plants, outside nature, artwork, or other pleasant stimuli are visible to most patients.	○	○	○	○	○	○
	Patients have easy access to magazines, information booklets, TV, or internet.	○	○	○	○	○	○
10	Daylight ☐ Check box if design feature implemented						
	Windows and/or skylights provide plenty of direct or indirect natural light into areas in which behavioral health patients are treated.	○	○	○	○	○	○
11	Patient control of window blinds, air conditioning, etc. ☐ Check box if design feature implemented						
	Air temperature, window blinds, and music selection/volume can all be adjusted by most patients.	○	○	○	○	○	○
	Controls of air temperature, window blinds, music selection/volume are within reach of most patients.	○	○	○	○	○	○
	Controls of air temperature, window blinds, music selection/volume are easy and intuitive to be used by patients.	○	○	○	○	○	○
12	Nursing station central location ☐ Check box if design feature implemented						
	The nursing station is located centrally, providing easy surveillance of interaction spaces (e.g., exam rooms) and reducing staff traveling.	○	○	○	○	○	○
13	Decentralized nursing station ☐ Check box if design feature implemented						
	The decentralized nursing station is located close to interaction spaces (e.g., exam rooms), providing easy surveillance to the interaction spaces and reducing staff traveling.	○	○	○	○	○	○
14	Nursing station with high visibility ☐ Check box if design feature implemented						
	Nursing staff members have a clear view of interaction spaces and corridors from the nursing station(s).	○	○	○	○	○	○
	Nursing station is open, providing a minimal barrier between patients and staff.	○	○	○	○	○	○
	I feel safe in the nurse station when caring for behavioral health patients.	○	○	○	○	○	○
15	Video monitoring ☐ Check box if design feature implemented						
	Video monitoring system provides continuous coverage over all public areas and behavioral treatment spaces without blind spots.	○	○	○	○	○	○

APPENDIX C

IRB Approval Letter

STEPHEN F. AUSTIN STATE UNIVERSITY

Institutional Review Board for the Protection of Human Subjects in Research
P.O. Box 13019, SFA Station • Nacogdoches, Texas 75962-3046
Phone (936) 468-1153 • Fax (936) 468-1573

Principal Investigator: Mitzi Perritt
Human Sciences
Box 13014
mperritt@sfasu.edu

Co-investigators: Rheena Ware (Rheena.luchansky@gmail.com), Ray Darville (rdarville@sfasu.edu), Dr. Karen Migl (kmigl@sfasu.edu) Annabella Koloskov (Akoloskov@eypae.com), Debra Taylor (Debra.Taylor@woodlandheights.net), Kristine Sutton (suttonk@nacmem.org) , Patti Bennett (Patricia1.bennett@tenethealth.com)

RE: Project Title "Effective Design Features for the Management of Behavioral Health Patients in Emergency Departments of General Hospitals" Case # AY2019-2098

TYPE OF RESEARCH: Thesis

FROM: Luis E. Aguerrevere, Chair, IRB-H

Luis E. Aguerrevere

DATE: May 8, 2019

I would like to thank you for submitting your project entitled "Effective Design Features for the Management of Behavioral Health Patients in Emergency Departments of General Hospitals" to the IRB for review. It has been reviewed and has been **Approved as Exempt** based on the following criteria:

CFR §46.101(b)(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:(i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

Your project has approval through **May 8, 2020**, should you need additional time to complete the study you will need to apply for an extension prior to that date. The IRB should be notified of any planned changes in the procedures during the approval period, as additional review will be required by the IRB, prior to implementing any changes, except when changes are necessary to eliminate immediate hazards to the research participants. The researcher is also responsible for promptly notifying the IRB of any unanticipated or adverse events involving risk or harm to

participants or others as a result of the research.

All future correspondence regarding this project should include the case number **AY2019-2098.**

APPENDIX D

OPEN-ENDED SURVEY RESPONSES

Respondent ID	Facility Name	Please explain any stressful or dangerous issues that have occurred during the treatment of behavioral health patients in your ED.	What additional design features should be incorporated into your existing ED to help manage behavioral health patients more effectively?
2	Nacogdoches Memorial Health	While attempting to obtain vitals, due to small room, patient grabbed by arm. Male nurses took over assessment allowing myself to be removed from situation.	Privacy for patients in crisis; quiet environment; but still allows for safety
3	Nacogdoches Memorial Health	Occasionally waiting days to find in care treatment for patients	
4	Nacogdoches Memorial Health	Finding placement for patients that need an inpatient bed; it's not uncommon for patients to sit in the ER for a week awaiting a bed.	More psych rooms; being able to room patients without having to strip rooms; psych patients away from the general ER population
5	Nacogdoches Medical Center	Patients have assaulted staff in the past	There should be security staffed at a position of patient entry to ER lobby and treatment areas.
6	Nacogdoches Medical Center	no central nursing station; no security/only when called; no designated/adequate BH room; feels like we are in a cave	central nursing station; video surveillance; designated room for behavioral health patients; more windows/natural lighting
7	Nacogdoches Medical Center	staff assaults; patients with weapons; violent patients; no security	safe room
9	Nacogdoches Medical Center	Patients with combative nature can cause issues; drug-induced or due to mental illness; I've seen patients ram their beds into the wall even with brakes on.	unsure
10	Nacogdoches Medical Center	We had a female psych patient who charged into the nursing station and physically attached to a male nurse. The patient had to be physically removed and law enforcement contacted.	
12	Nacogdoches Medical Center	I have not witnessed any of those issues in this ED	sliding glass doors should be changed; increase # of patient sitters available
13	Nacogdoches Medical Center	We have had several aggressive patients with irrational delusions who have and/or would have become a danger to others; one patient brought in a gun.	designated offices in the unit
16	Woodland Heights Medical Center	A psychiatric patient under an EPOW (emergency peace officers warrant) came out of the room and assaulted two of the nurses, there were no officers around at the time to help; another psychiatric patient under an EPOW with an officer in the room tried to overcome the officer and attempted to take his gun and the doctor and another nurse had to help hold him down until backup arrived.	better security (officers/staff with means to help if a situation gets bad); better locking systems (the ambulance bay doors are "locked" but if you barely pry them with your hands they will open with ease); better designs for registration desk (maybe glass/plexiglass to help better secure them for unruly patients in the lobby)

VITA

In May of 2011, Rheena Ware Luchansky graduated from the University of Pittsburgh with a Bachelor of Science in Bioengineering and Bachelor of Arts in Architectural Studies. Mrs. Luchansky was awarded her Master of Science in Human Sciences with a concentration in Healthcare Design in the winter of 2019. Leveraging her diverse educational background, Mrs. Luchansky has had the opportunity to work in a variety of healthcare environments working with technology, architectural design, construction, and medical equipment planning. Strengthened by her newest degree, Mrs. Luchansky will continue to build upon her career in current healthcare consulting.

Permanent Address: 2605 Calumet Street Apt 25

Houston, TX 77004

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This thesis was typed by Rheena Ware Luchansky.