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How Architecture Can Promote a Sustainable and Therapeutic Experience for Patients in Psychiatric Hospitals in China

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HOW ARCHITECTURE CAN PROMOTE A SUSTAINABLE AND THERAPEUTIC EXPERIENCE FOR PATIENTS IN PSYCHIATRIC HOSPITALS IN CHINA

by

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"How architecture can promote a sustainable and therapeutic life for patients in psychiatric hospitals in China"
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ABSTRACT

Mental, physical and social health are the interwoven strands of well-being for all individuals' lives. Mental health, in particular, is crucial to the overall robustness of humans, as it enables individuals to realize their abilities, cope with the normal stresses of life, work productively, and contribute to their communities. Unfortunately, mental disorders have suffered the stigma of disgrace. Although the world has long struggled to understand, identify, and treat mental illnesses, the quality of relative facilities and treatments lags far behind other medical fields. The conditions of mental healthcare facilities are especially inadequate in developing countries, like China.

The author's direct personal experience informs this thesis. Diagnosed with a major depressive disorder, she was institutionalized in a psychiatric hospital in China for one month. She compares it to prison for criminals rather than a hospital for treating patients with illnesses. As a designer, the author sees an opportunity to improve the living conditions and promote a sustainable and therapeutic experience for psychiatric patients through architecture.

This thesis conducts a series of literature review, background research, and interviews regarding the architectural design practices of psychiatric hospitals including China. It also summarizes the findings and makes recommendations on sixteen design practices towards enhancing life for psychiatric patients of China.

CONTENTS

1. INTRODUCTION

For humankind, mental, physical and social health are interdependent, interactive and interconnected. Mental health, especially, is crucial to the overall well-being of individuals and their societies. It affects performance, relationships, works, productivities, and community engagement. In many parts of the world, mental health is not regarded as important as physical health and social health. Mental illness has historically been ignored or discriminated against and has often promoted fear through lack of understanding. These negative attitudes lead to the stigmatization of mental illness and the inhumane confinement of mentally ill individuals. A half-century ago, mental institutions were designed like prisons, lacking sunlight, presenting an atmosphere of isolation, using iron bars or doors to separate patients and without furniture or color…However, research shows that mentally ill people need a healing environment to positively affect treatment and recovery. Though the bad living conditions of psychiatric patients have been altered in some developed countries since the mid-1950s, the improvements have not been realized in psychiatric hospitals in China, even in some of its best facilities.

After enduring major depressive disorder without treatment for 25 years, the author finally received professional treatment in Beijing Anding Hospital until one year ago, as the negative attitudes toward the mental illness are still strong in China. Admitted to Beijing Anding Hospital, considered one of the best psychiatric hospitals in China, the author came to understand that it is actually representative among the Chinese psychiatric hospitals. The unhealthy conditions include: the windows are separated into many small windows by dark, iron mullions to prevent suicide and escape; huge wards are designed for a large number of patients with no privacy; no personal belongings are allowed; colors around are white and gray; three cold iron

doors isolate patients from the outside world; the bathroom is dirty, slippery and ugly… These conditions are adversely affecting patients' treatments and recovery.

After experiencing these firsthand conditions, the author conducted research on how architecture can promote a sustainable and therapeutic experience for the patients in psychiatric hospitals of China.

This thesis identifies 51 references from different databases and conducts close examinations of 20 literature sources; studies the history and trends of psychiatric hospital development and design globally; observes the current situation of psychiatric hospitals in China; examines professional design practices from a series of case studies of advanced psychiatric hospitals; conducts interviews with psychiatric patients of Beijing Anding Hospital; and analyzes patient interviews conducted by other researchers.

To achieve the research goal of promoting a sustainable and therapeutic experience for the patients in psychiatric hospitals of China, this thesis summarizes the main findings and considerations from the literature reviews, background research and interviews. Then, makes recommendations for sixteen architectural design practices based on four starting points for psychiatric hospital design in China. Considerations include including the building shape, layout, façade, location, privacy, gardens, social interaction, entertainment rooms, interior finishes and color, lighting, noise, smoking rooms, safety and security, and nursing stations. This research will contribute to the foundation of actual design practices for psychiatric hospitals in China and help translate existing studies and researches into improved designs.

This thesis will show how mental healthcare facility design is a critical component of psychiatric patient care, affecting how treatments and services are provided and the efficiency with which the patient recovers. As the mental healthcare facilities and services in China lag

behind most of the developed countries, this thesis proposes sustainable and therapeutic practices that can be introduced into the design of psychiatric hospitals in China for the benefit of patients.

2. LITERATURE REVIEW

In order to establish a framework for enhancing the lives of patients in psychiatric hospitals, this thesis identifies 51 references from different databases and conducts close examinations on 20 literature sources listed below in four domains: 1) user perspectives; 2) design features; 3) employed methods; and 4) outdoor environments. All resources were published from 2005 to 2017. They provide comprehensive background information of psychiatric hospital development, methods employed during the research, findings, suggestions and solutions regarding the various aspects of design practices, as well as numerous quantitative and qualitative data of end users' perceptions. The review of the literature helps shape the research methodology, interviews and the decisions of the thesis.

Domain I: user perspectives

Design in mind: eliciting service user and frontline staff perspectives on psychiatric ward design through participatory methods.

This journal article reports a study which recorded and analyzed psychiatric patient and staff perceptions towards the ward design by employing innovative methods (Shepley et al., 2016). The study methods consist of metrics generation, test and retest of the new metrics, and an inpatient photographic study. The data collection took place at four 18-bed acute wards of a national health service mental health trust in a large city during 2012-2013. Questionnaires and interviews were conducted among two groups of users (patients and staffs), while photographs were taken by the patients of places they like or dislike most within the hospital. Results of the study demonstrate a method of obtaining endusers' perceptions of ward design; provide

qualitative and quantitative resources of end users' perceptions; and provide valuable evaluations of inpatient psychiatric facilities. Because of a lack of such research, this study and data have been valuable in helping the thesis draft the interview questionnaire and better understand psychiatric patients' environmental needs.

Creating 'therapeutic landscapes' for mental health caregivers in inpatient settings: A dynamic perspective on permeability and inclusivity.

This research was part of a newly constructed mental hospital project in a mid-sized industrial town in Northern England, taking place between 2010 to 2011. It was designed to evaluate the changes in inpatient settings between an old facility and this new facility that replace it (辛闻, 2015). Distinctively, this research started from caregivers (friends and families) perceptions and observations, rather than patients and staffs perceptions. Caregivers' actions blur the responsibilities and boundaries between the works of professionals and the care of families and friends; therefore, caregivers are viewed more as partners in the recovery process, and their needs and wellbeing should also be addressed in hospital design. This research unusually examines whether the new inpatient environment offers a therapeutic landscape and benefits the wellbeing of caregivers, as well as patients and staffs, from the caregivers' perspectives. The research gains qualitative data through interviews and discussion groups. The findings are reported in 7 specific domains. The thesis studies this research as it starts out from an unusual angle, the caregivers' perceptions, which is totally different from other literature sources reviewed by the thesis. Additionally, it includes qualitative data from the caregivers, discussing the design issues from their perspectives. Though the importance of addressing caregivers' needs

in the inpatient environment hasn't been confirmed by present studies, this research can be useful as an additional tool for seeking the best practices within mental healthcare environments.

Therapeutic landscapes' and the importance of nostalgia, solastalgia, salvage and abandonment for psychiatric hospital design.

This paper mainly examines emotional reactions to changes in landscapes of mental health care spaces. It describes "how the meanings attribute to 'therapeutic landscapes' from one's past can evoke emotions or memories, manifesting in ideas about nostalgia, solastalgia, salvage and abandonment, which can impinge on one's therapeutic experience" (中环现场, 2015). The therapeutic experiences of patients can be influenced by built environments, relationships and the meanings attached to these by patients. This paper analyzes findings from a case study regarding the transfer of psychiatric inpatient care from an old to a new facility. Further, interviews were conducted among the end users of this new facility. Finally, the paper makes recommendations for good practices in future mental hospital designs, based on the findings. This thesis uses this paper mainly to understand how patients react emotionally to the changes in the caring environment, especially when the environment can have a positive impact on the users.

Including patients, staff, and visitors in the design of the psychiatric milieu: Notes from the field

This paper presents the benefits of participation of the end users during the design process of mental healthcare facilities. It describes three case studies, in which the end user opinions were used in the decision making of the psychiatric hospital designs. The paper also

creates a conceptual framework using “design imperatives” that have been successful in the design of outdoor settings (Wood et al., 2013). In the findings, nine design imperatives are shown that can be applied to mental health facilities to achieve therapeutic benefits for the end users. This thesis cites this paper as it highlights the engagement and the importance of end users in the design process. It combines end users concerns, recommendations and opinions for each case study, which are adopted by the thesis as additional sources.

Domain II: design features

Mental health facility design guide 2010 by the US Department of Veteran Affairs.

This design guide was published by the US Department of Veteran Affairs as a tool for guiding designers to understand the comprehensive functional and operational requirements within professional mental health facilities. The Veterans Health Administration operates one of the world’s most comprehensive mental health care systems (Bengtsson and Grahn, 2014). A central theme of the design guide is that the therapeutic environment is critical to the recovery process. Emphasis is placed on hope, healing, meaning, and the potential of individuals, as well as enhancing socialization, engagement, and coordination, and one’s control of the social environment. Further, the design guide summarizes the trends of mental health facility design, design recommendations and criteria, technical methods, and different mental care program and services. This thesis refers to this design guide as it illustrates fundamental knowledge and future design concepts for mental health facilities, covering the functional and operational requirements for numerous design elements. It is considered one of the foundations for future research and design of the thesis.

Best Practices: environmental and therapeutic issues in psychiatric hospital design: toward best practices.

This review has been applied as a guiding tool by architectural design teams and has been adopted by The Veterans Health Administration. It classifies the best practices of psychiatric hospital design; combines important literature findings; draws on whose firsthand experience in the design of a new inpatient psychiatry building at the VA Palo Alto Health Care System. The review surveys relevant research and literature. “Findings are classified into five domains, including ambient features, architectural features, interior design features, social features, and specific issues” (Karlin and Zeiss, 2006), covering different design issues and considerations that have the potential to enhance the inpatient environment. This thesis suggests that the identified practices in the review can be fully incorporated into future research and designs of psychiatric hospitals to provide an inclusive, dynamic and patient-centered design approach. The suggestions are organized in clear, specific and straightforward categories.

Mental and behavioral health environments: critical considerations for facility design.

This paper reports a research on the physical environment of mental health care facilities. The study was developed to identify design features with positive impacts on patients and staffs in mental health care facilities and to develop a foundation for future research. The study conducted 400+ literature reviews during the research, emphasizing on inpatient facilities and outpatient environments. Nineteen interview scripts were designed based on these literature reviews. The interviewees included psychiatric staff, facility administrators and architects. “Seventeen topics were addressed in the interviews ranging from the importance of a deinstitutionalized environment to social interaction and autonomy” (Shepley et al., 2017). The

results are reported comprehensively under each category. In its conclusion, the paper summarizes potential design topics and design goals for both new or remodeled mental health care facilities. This thesis is informed by the breadth of the reviews and interviews based on 300+ article reviews and 100+ publications of mental behavioral health design, demonstrating strong reliability and feasibility of the topic. In addition, this paper alternatively studies the perceptions of psychiatric staff, facility administrators and architects, rather than the patients' perceptions of psychiatric hospitals.

Compassionate containment? Balancing technical safety and therapy in the design of psychiatric wards.

This paper emphasizes the connections between different theories of therapeutic landscape and other social theories regarding the social control involved in surveillance and risk governance. The author states, "It demonstrates a strong awareness among the end users about how responsibilities for risk governance of 'persons' are exercised through 'technical safety' measures and the implications for therapeutic settings" (Yanni, 2007). The paper carried the research through an evaluation of a purpose-built inpatient psychiatric healthcare facility, opened in 2010 in England. The data was collected from interviews and discussion groups with staff, patients and their families and friends. Their comments revealed their concerns of how surveillance and risk governance might conflict with a therapeutic environment and their considerations that they might engage more effectively with patients without obvious implementation of technical safety measurements. This paper supports the premise of this thesis that safety and security design within the mental healthcare environment are important issues.

Spaces for smoking in a psychiatric hospital: Social capital, resistance to control, and significance for 'therapeutic landscapes'.

This paper focuses on whether psychiatric hospitals should allow smoking among patients, smoking's effect on the recovery of patients, and how smoking spaces are organized within hospital settings. The paper gathered data from observations, conversations, and interviews with the patients, caregivers, and staff. Methods focus on building design and settings in relation to patients' wellbeing. Remarkably, issues relating to smoking emerge as important for many participants (Shepley et al., 2016). However, allowing smoking and creating smoking spaces within psychiatric hospital environments are controversial topics among current studies. Smoking is detrimental to physical health, but it creates social and psychological significance among patients and staff, as well as provides resistance to institutional control, which in all might contribute to the therapeutic landscape of the hospital. This thesis recognizes this special topic that hasn't been fully addressed by other current literature and raises a controversial question of whether psychiatric hospitals should allow smoking. The discussion about smoking spaces will be addressed in the following chapter of this thesis.

Architectural design of a secure forensic state psychiatric hospital

This article introduces the architectural design at the Colorado Mental Health Institute. The project was designed based on the opinions of staff, outside consultants and an experienced architectural design team. The main focus of the design was to maximize the dignity and privacy of the patients on the one hand, while increasing the observation ability of the staff on the other. This thesis studies this article as it provides a practical example of a successfully designed psychiatric hospital, including various design features and necessary functions regarding the

safety and security issues of the Colorado Mental Health Institute. It also provides the site plan, unit plan, and overall building plan of this institute, which became an important study reference for this thesis.

The importance of audio-visual aspects in the architectural design of psychiatric clinics.

This article discusses the impacts of audio-visual environments on psychiatric patients and the architectural design of the audio-visual environments. Poor technical conditions of mental hospitals will have a negative impact on treatment. Lighting and acoustics are the main attributes of audio-visual space and are closely linked to the process of treatment. For example, noise is a stressor; and low light conditions can worsen depression. This thesis refers to this article as it mainly presents a specific design element within the psychiatric hospital environment. The article summarizes design solutions for noise and lighting in detail, which can be fully adopted in this thesis research.

The therapeutic impacts of environmental design interventions on wellness in clinical settings: a narrative review.

This review documents the role of physical elements in mental healthcare facilities and their influences on the well-being of patients and staff. The review identified 1393 references through several databases, with closer examinations on 195 references. These references include significant content relating to physical elements that have positive or negative effects on the patients and staff, which demonstrate that a well-designed physical environment has the potential to impact the well-being of the users in various ways. The review also summarizes the design trends towards promoting a therapeutic environment in mental hospitals. This thesis studies this

review as it documents, as well as summarizes the theories, findings, and trends of mental healthcare facility design based on an extensive body of literature. A large number of references suggest strong reliability and feasibility of the findings and can, therefore, be reliably utilized for this thesis.

Stress reduction in the hospital room: applying Ulrich's theory of supportive design

This study was conducted to test Ulrich's (1991) theory. According to Ulrich's theory, the hospital environment will reduce stress if it fosters perceptions of control (PC), social support (SS), and positive distraction (PD) (北京青年报, 2005). Though this theory is well-established, there is no empirical test of any model. The test result confirms Ulrich's theory. This research investigates numerous small design elements in a psychiatric ward and specifically addresses their influences on the patients' well-being. It also provides a chart listing the experimental conditions of PC, SS and PD and the relating design elements. These results contribute to the detailed research of this thesis.

Domain III: employed method

Mental and behavioral health settings: importance & effectiveness of environmental qualities & features as perceived by staff.

This paper reports research involving the development and testing of a survey - the Psychiatric Staff Environmental Design (PSED) tool - on mental health facilities. The goals of the research include evaluating the importance and effectiveness of different design features, generating mental health facility design guidelines, and making recommendations for future research. During the exploration of the PSED tool, staff was recruited as participants from four

psychiatric nursing organizations and a large mental health facility in New York City. The survey includes 17 demographic questions, 63 Likert-style questions, 11 ranking questions and two open-ended questions (Karlin and Zeiss, 2006). The results are recorded in multiple categories with specific quantitative and qualitative data. The research demonstrates the feasibility of the PSED tool among mental health facilities; other important findings are also thoroughly analyzed by the paper. This thesis studies this paper as it provides quantitative data from the staff survey and introduces the method for generating a tool for evaluating design features of mental health facilities. The data are so comprehensive and can be adopted by the thesis as evidence during the research. The PSED tool also helps shape the development of thesis' interview. Moreover, the paper was published in 2017 and therefore a current resource.

Stressed spaces: mental health and architecture.

This paper presents a comprehensive review of the existing literature of 2011. It covers the influence of architectural design on users of mental healthcare facilities under a broad socio-economic and political context, especially to contribute to the mental healthcare facility design field. Sources were gained through numerous architecture and health websites during research phase I, as well as through 165 articles from 13 databases in phase II. Sixteen keywords that were applied in the research were carefully defined and selected by the paper's authors. This comprehensive and systematic review summarizes 13 major themes of architectural design practices, giving specific explanations and recommendations for each theme. This thesis utilizes this paper as a literature resource through 2011, adopting its keywords for research.

Design in mind: eliciting service user and frontline staff perspectives on psychiatric ward design through participatory methods (summarized in Domain I).

Domain IV: outdoor environment

Outdoor environments in healthcare settings: a quality evaluation tool for use in designing healthcare gardens.

This article introduces an easy-to-use Quality Evaluation Tool (QET) to be utilized in the design process of outdoor environments for healthcare facilities. Though thousands of research studies demonstrate that an outdoor environment can serve as a positive element during patient recovery, no guidelines regarding garden design have been established. Subsequently, this article summarizes theories and evidence of outdoor environmental design within healthcare contexts to contribute to the fundamental basis of this QET. The development of QET was based on multiple scientific sources and is fully described in charts and figures. This thesis utilizes this article in evaluating the outdoor space design of healthcare facilities. Further, the article provides various visual examples for each design feature of the outdoor spaces that are considered to be important. Though it was not exclusively designed for the mental healthcare system, the thesis can largely draw on this article to seek better design solutions.

How nature can be used to create a therapeutic outdoor environment.

This article reports a scheme of introducing wildlife into a group of 305 care homes in the UK. The scheme is considered to have positive effects on the residents and staff and encourage declining wildlife back to urban gardens (Vujcic et al., 2017). It offers residents a different lifestyle with various activities and relaxations (feeding the wildlife; making food and shelters

for wildlife; playing with wildlife…). The article discusses how this scheme can bring therapeutic benefit to the residents and staff, as well as how protecting wildlife can be implemented at the care homes. This article suggests an innovative therapeutic treatment for people suffering from different illnesses and injuries. Though the scheme was rolled out in care homes, this thesis suggests the idea can be transferred to mental healthcare facilities with specific changes for creating therapeutic landscapes for psychiatric patients.

Nature based solution for improving mental health and well-being in urban areas.

This was a pioneering study in Serbia, conducted to understand how horticulture therapy in urban green environments can improve mental health, even though horticulture therapy hasn't been accepted as a professional mental health treatment. The study was based on post-evaluation and DASS21, "which is a self-report instrument measuring current symptoms of depression, anxiety and stress" (Szántová and Rychtáriková, 2015). During the research, 30 psychiatric patients and hospital users stayed in a Serbian botanical garden three days a week, one hour a day, for one month, and participated in a special nature-based therapy program. The results indicate a positive influence of nature-based therapy on the mental health of the participants, specifically on stress-related mental issues. This thesis studies this paper as it raises an innovative way of treating the mental disease. The result of the study can influence the architectural design and well-designed outdoor green space for mental health facilities.

Collaborative design: outdoor environments for veterans with PTSD.

This paper explores collaborative outdoor designs and their potentials to contribute to the wellness of veterans diagnosed with PTSD, along with their families and staff. The study verifies

that nature improves physical and mental health outcomes through a review of various literature sources. It shows the combination of landscape architecture and occupational therapy are key elements to achieving successful design outcomes and supporting the healing process. Furthermore, the findings show that collaboration among clinicians and designers during the design process is critical in assisting the healing process. This thesis stet this paper's focus on the benefits of outdoor environments on the recovery of patients, as well as its suggestions for practical outdoor environment design principles with specific explanations and references.

Therapeutic landscapes: an evidence-based approach to designing healing gardens and restorative outdoor spaces.

This book focuses on the creation of therapeutic outdoor spaces within healthcare facilities using the keyword healing garden and restorative garden. The core of the book consists of garden design guidelines for different types of healthcare facilities, including mental hospitals that are documented for assisting architects and designers during the design process. Chapter 12 introduces garden design for mental and behavioral health facilities, stressing the benefits of nature on the recovery of psychiatric patients. Comprehensive guidelines and recommendations are provided for designing healing gardens in psychiatric hospitals, along with several case studies for garden designs in mental healthcare facilities. This thesis focus on this chapter as the most comprehensive guidebook for designing outdoor gardens for mental healthcare facilities, which is a primary focal point of this thesis research.

3. BACKGROUND RESEARCH

Introduction

Mental health is vital to the overall well-being of individuals. According to the U.S. Centers for Disease Control and Prevention, 26.2 percent of Americans ages 18 and older—more than one in four adults— suffer from a diagnosable mental disorder in a given year (Karlin, and Zeiss, 2006). Psychiatric patients shouldn't be judged or labeled into certain group by their behavior. Psychiatric patients need professional protection, pleasant living conditions and strong support from society due to their vulnerability. To study how to create a new design philosophy, how to prevent design mistakes, and particularly, how to improve the living condition for hospitalized psychiatric patients in hospital, this thesis refers to the history, as well as current trends, of psychiatric hospital development and design across the world. Simultaneously, the current situation of Chinese psychiatric hospitals is reviewed to analyze the gaps between their development and other developed countries. In addition, case studies of advanced psychiatric hospital design methods and their effects on patients are discussed in this thesis to help create a new design philosophy. Further, interviews with psychiatric patients in Beijing were conducted. The results of these interviews, as well as the findings of other users' interviews, are analyzed in this thesis to provide examples of what users need and want. Through the background research, we gain a thorough understanding of how architects can promote a sustainable and therapeutic experience for patient in psychiatric hospitals in China, as well as the best practices for designing psychiatric hospitals in China.

The history of psychiatric hospital development and design

In the latter part of the Middle Ages, insane asylums were in reality dungeons. They were grubby, gloomy and the patients/ prisoners were chained, tortured, and treated like wild animals. In 1792, at an asylum in Paris, an experiment of removing chains from the prisoners and releasing them into tidy and sunny wards was conducted. It was discovered that many of these patients showed signs of recovery and were able to leave the asylum.

These new European ideas about the care and treatment of mental illness were soon brought to the United States during the opening decades of the nineteenth century. The idea was called “moral treatment”, which generated a new type of asylum. The treatment assumed that mental illness would be cured if the patients were treated kindly and in ways that appealed to the parts of their brain that functioned rationally. It was against the use of harsh restraints and isolation of mentally ill individuals with the most severe behaviors. It led to specially designed hospitals that provided secluded and peaceful country settings, meaningful work and recreation opportunities, privileges and rewards for rational behavior and shorter periods of gentler restraints (Shepley et al, 2016).

In the mid 19th century, the Kirkbride Plan provided plans for how hospitals devoted to moral treatment should be designed, built and organized. These new types of buildings, generally located on farmlands, became the prototypes for many future insane asylums. Each building served hundreds of patients with a central core and long, rambling wings to provide natural light, access to the natural environment and privacy for patients. St. Elizabeth Hospital in Washington D.C. (Figure 1) and Hudson River State Hospital in New York City (Figure 2) are good examples for Kirkbride Plan.

During the last decades of the nineteenth-century, treatment of mental illness tended to move outside asylums. Outpatient care developed quickly as it provided an inexpensive alternative to the treatment. It stimulated the development of several outpatient dispensaries, such as the Pennsylvania Hospital dispensary in 1885 and the Boston dispensary in 1897.

Begin in the 1900s, the idea of keeping patients outside the institutions began to dominate the policy-making (Iyendo, 2016). The concept was to keep the most dangerous patients and severe cases in state hospitals; other patients would stay in regular hospitals for short-term observations to decide whether they required confinement in State hospitals. The aim was to cut costs for state hospitals. However, this concept announced the sad ending of Kirkbride plan buildings as the government determined to use the old lunatic asylums as state hospitals to incarcerate those dangerous patients. Also due to the fact that Kirkbride Plans were too expensive to maintain, some were demolished, some were repurposed, and others were renovated and restored. Many of these large buildings were used by mental health departments to house thousands of people who couldn't take care of themselves and had nowhere to go. We can still find such plans in existing psychiatric hospitals, such as the Delaware Psychiatric Hospital Center, Jacksonville State Hospital in Illinois, the Helsingør Psychiatric Hospital in Denmark and the Forensic Psychiatric Clinic of Stockholm.

Around 1912, a new type of institution - the psychiatric hospital - appeared. They were specialized hospitals for short-term observation and assessment of patients' mental illnesses. After a few days, doctors would decide whether to send the patient home or to state hospitals. This was a bold step in mental illness treatment as patients were allowed to convalesce at home.

During the 1950s, new mental health care models replaced the large complexes with smaller buildings. This model provided the ability to group different patient types into different

buildings. By the mid-1950s, a push for deinstitutionalization and outpatient treatment re-emerged around the world. This international movement aimed to transform the "asylum-based" mental health care system to community-oriented care and depended on the belief that psychiatric patients would recover better if treated in their communities rather than in large, isolated asylums. The 1970s was the height of deinstitutionalization; the driving force behind this phenomenon was cost-cutting. Though many argue the positive effects of community-based mental health care programs, such as patients would receive better care and feel more comfortable in community-based healthcare facilities, critics of the deinstitutionalization movement found that individuals living in community settings had "significant deficits in important aspects of health care, including vaccinations, cancer screenings, and routine medical checks," and community nursing centers or residential homes were not always equipped to meet the requirements for mental illness. However, even opponents of the deinstitutionalization movement contend that most patients would benefit more from community-based treatment programs if these programs are well equipped and staffed (Bengtsson and Grahn, 2016). With this emphasis on deinstitutionalization and a community-based healthcare model, both the number of psychiatric hospitals and psychiatric patients declined dramatically, yet the need for psychiatric hospitals still existed. Treatment and diagnosis for severely mentally ill people continued to be available (Shepley et al., 2017). At the same time, some new facilities had been constructed to meet the new demand of advanced treatments.

Over the past few decades, mental healthcare facilities find it more and more difficult to treat patients within outdated and deteriorating facilities, driving the design and construction of new, modern mental healthcare facilities. Further, an increasing percentage of people diagnosed with mental illness has accelerated this process (萬萬, 2015). Consequently, smaller-but-high-quality

community-based facilities with a more structured care environment emerges to fill the void. These facilities provide mental health patients with professional treatment and assistance for extended periods of time, and “often aid in the transition to self-sufficiency”. Many psychiatrists consider these facilities as one of the most important parts of mental health system (Karlin, 2006). Nowadays, with the stigma gradually fading away, more people are becoming potential patients. Recovery and shorter stays have become the main focus of treatment at psychiatric hospitals.

In conclusion, the design of psychiatric hospitals is intertwined with the treatment of mental illness. As architects, we understand that the physical environment can deeply impact the well-being of a psychiatric patient. When we design, our consideration of mental illness can help us create a safe, supportive and positive atmosphere that contributes to the recovery process of patients, while avoiding the mistakes that our predecessors made.

Figure 2 St. Elizabeths Hospital, Washington D.C.

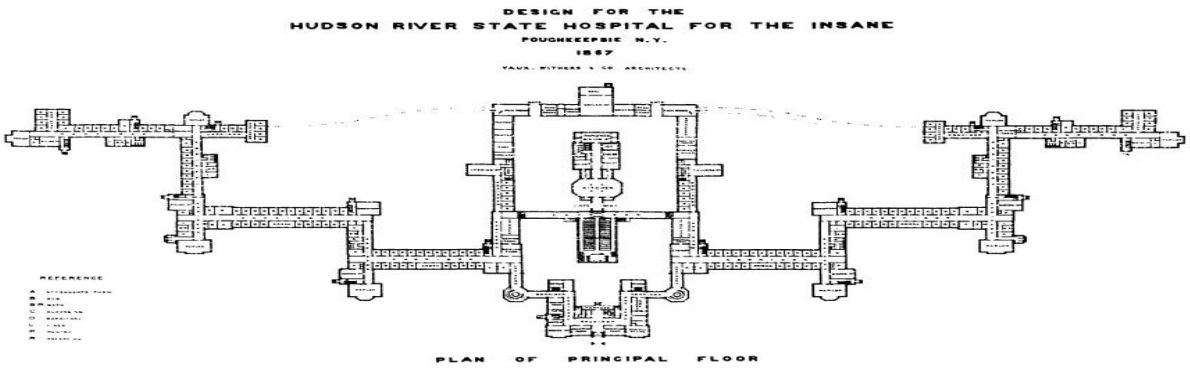

Figure 1 Hudson State Hospital. 1867

Current trends of psychiatric hospital design

Contributing to a boom in the construction of psychiatric facilities is a paradigm shift in the way mental illness is viewed by society (中环现场, 2015). The philosophy of today's psychiatric facility design usually addresses the following concerns.

- Newer facilities are making the inside an extension of the community outside. Patients need to feel as if they're in familiar surroundings so that they can react to the environment better. Facilities should resemble a real community in which patients will live after treatment (Figure 3 & 4). This has been shown to reduce social isolation, as well as to create a smooth transition for patients moving through professional levels of care toward eventual independent living in the community.
- Rather than treating all patients the same in large institutional settings, healthcare organizations are evolving toward smaller-scale settings that address an individual patient's particular needs in the recovery process (Shepley et al., 2017).
- Today's facilities tend to be sprawling, single-story buildings with a campus feel (Figure 5). As with the Kirkbride plans for 1900s, this structure allows for natural lighting, an airy environment, and access to outdoors, which are deemed important elements in the recovery process. However, the downside of these sprawling facilities is expensive construction and maintenance costs, based partly on a huge footprint and large amounts of exterior walls.
- The management inside the facility should be efficient, clear and easy. Distances and adjacencies are crucial to treatment, safety, and security. A single story building with more than 120 beds could be difficult to manage (Shepley et al., 2017).

- Many facilities are transforming from semi-private wards to a private ward, which has aroused controversy among experts, who fear the risk of patient suicide in a private ward.
- Safety and security of patients and staff must be ensured. There shall be nowhere for patients to hang themselves, no way for them to make weapons and nothing for them to throw. Removing or weakening the barriers between nursing staff and patients should also be considered carefully.

In conclusion, the concerns listed above represent the new directions in psychiatric hospital design of the 21st century. By emphasizing the social role of patients, the needs of individual patients, access to the natural environment, efficient management inside the facility, the transformation of patient wards, and the safety and security of patients and staff, newer mental healthcare facilities could help psychiatric patients with quicker recovery, and greater independence and happiness.

Figure 3 The main of Riverview Psychiatric Center.

Figure 4 The central café of Riverview Psychiatric Center.

Figure 5 Cordilleras Mental Health Facility

Current situation of Chinese psychiatric hospitals development

It's evident that the development and standard of Chinese psychiatric hospitals lag far behind than other developed countries. At the same time, according to a 2009 study published in the British medical journal The Lancet, the number of Chinese suffering from a mental disorder reached 173 million, but only less than 6% sought professional help. Adding to the problem, there were only 20,000 psychiatrists in China, equaling 1.5 for every 100,000 people, or a tenth of the ratio in the United States (Wood et al., 2013).

This thesis summarizes the main reasons of this situation as follows. 1) Low investment from the government: only less than 1% of the national health budget of China is allocated to mental health care (Karlin and Zeiss, 2006). 2) Limited well-trained mental healthcare professionals: the wages are low, roughly equivalent to 769 USD per month for an attending doctor/ psychiatrist, according to a personal interview with one of the attending doctors of Beijing Anding Hospital; additionally, medical students are unwilling or even afraid to study psychology, worrying that they may also catch mental diseases while working with psychiatric patients. 3) Poor access to mental healthcare services and systems: professional mental health services are mostly or only provided by large psychiatric hospitals; general hospitals or community medical facilities typically do not provide any mental health services. Further, most rural people still have less access to any form of mental health services (北京青年报,2005). 4) A huge shortage of insurance coverage: in recent years, only 45,000 people in China had been covered for free outpatient treatment and only 7,000 for free inpatient care (辛闻, 2015). 5) The lack of medical resources: hospitals don't have enough medical resources or enough hospital beds to meet demand, with only 1.7 beds per 10,000 of the general population (Yanni, 2007). 6) A high level of stigma and discrimination: most Chinese people still believe in the stereotype

that people with mental illness are more violent and brutal than so-called “normal” people, posing a higher risk to public safety; some think that people with psychiatric conditions are possessed by evil spirits; some regard mental illness as a social contagion; families are ashamed of having kin with mental illness; individuals with mental health issues resist seeking help because they are too embarrassed. 7) Closed management measures: Most Chinese psychiatric hospitals implement closed management measures, and therefore people are reluctant to stay, afraid of being locked behind bars. Such management also has negative impact on the recovery of patients.

While the Chinese government has made efforts to reverse the current situation of Chinese psychiatric hospitals, the change is slow and difficult. As new psychiatric hospitals have opened, services and treatments have been upgraded at some existing facilities. However, many such hospitals continue to resemble prisons and treat patients as prisoners, with limited medical resources and professionals.

The author of this thesis has suffered from severe major depressive disorder for 25 years and had received treatment and care for one month in 2016 in Beijing Anding Hospital, one of the best public psychiatric hospitals in China. During that time, the author witnessed and experienced inhumane conditions including: patients with one single violent outburst could be strapped to their beds for a full day or even several days (Figure 6: nurses are tying patient to the bed); special hooks, designed for easily restraining patients, were installed at six different points of each bed; there was no decoration or furniture except beds in the ward; patients were scared and confined; three cold, iron doors isolated them from the outside world; huge wards accommodate 10 or more patients, giving them no privacy at all (Figure 7); the bathrooms were dirty, dark and cold, and shared by all the patients at a specific time; windows were separated

into many small panes by dark iron mullions to prevent suicide and escape; colors around the living space were dull gray and white, and finally there was no access to outdoor spaces. Considered this is one of the best public psychiatric hospitals in China, the average public psychiatric hospitals in China are worse. This thesis provides pictures of similar ward conditions in public psychiatric hospitals of China (Figure 6 & 7).

Fortunately, there has been a surge in higher quality private psychiatric hospitals in China. Private psychiatric care in China grew at a compounded 20% annually to 2014 (Yanni, 2007), possibly due to China's fast economic growth. Wenzhou Kangning Hospital Co, China's first and largest private psychiatric hospital is raising capital amounting to 193 million CNY/ 30 million USD with the aim of expanding its business (Vujcic et al., 2017).At another private psychiatric hospital, Beijing Yining Hospital, 38 beds are attended by 20 full-time medical staff; each patient can have his own living quarters rivaling that of a luxury hotel (Yanni, 2007). Meanwhile, the costs at these desirable private hospitals are expensive, where top rooms can cost nearly 1000 USD a day.

In terms of architectural design, psychiatric hospitals in China lag far behind the world. First, no formal design specifications for psychiatric hospitals of China have been published, and therefore efficient dimensions, function, planning, and layout have not been addressed effectively. Second, published papers about psychiatric hospital design theories and methods are rare in China, which also shows a lack of research among design professionals (北京青年报, 2005). And third, there is no paradigm of psychiatric hospital design in China for designers to use as a reference; though there are a few newly constructed advanced psychiatric hospitals in China, the documentation of their designs is not widely accessible.

In conclusion, the development and architectural design of Chinese psychiatric hospital are behind other developed countries. A few private psychiatric hospitals in China have advance treatments and designs, but related documents are rare.

Figure 6 A patient is tied down at a mental hospital in Taiyuan, Shanxi province

Figure 7 A current public psychiatric hospital of China

4. CASE STUDY

Case 1: Helsingor Psychiatric Hospital/ Ellsinore Psychiatric Clinic

Architects: BIG +JDS Architects/ Location: Helsingor, Denmark / Project year: 2006

Figure 8 Helsingor Psychiatric Hospital

Though the design group had conducted intensive research and interviews with the patients, relatives, staff, and clients, there was still no clear concept of what this clinic should be.

The two-level structure of Helsingor Psychiatric Hospital is comfortably situated into the green and hilly landscape. Nestles in nature preserves the views from the clinic itself and allows its users to have multiple views of the surrounding lake and woods. Where the building is half rooted underground, the lawn stretches over the roof, making this clinic part of its natural environment for curing the mental illness (Figure 9). Peaceful and calm nature settings have been shown to enhance the healing and recovery of patients.

The design concept of Helsingor Psychiatric Hospital eliminates clinical facility stereotypes. Traditional hospital hallways have no windows, rooms on both sides, and artificial easy-cleaning materials, such as plastic paint, linoleum on floors and ceilings. In Helsingor, all materials are natural textures. Cast floors in concrete and lively colors and walls are made of glass, wood and concrete (Figure 10). The functions are designed to fit modern treatment and

therapy. The conflicting ideas collected from the interviews drove the design to balance the following principles:

- Decentralized/centralized

  Psychiatric hospitals should provide an appropriate organization to maximize health care. Walking distances must be effectively and logically minimized. Meanwhile, autonomy and intimate spaces for patients should be provided to give them a sense of home.

- Freedom/control

  Part of the hospital contains observed treatment areas, where patients have limited freedom to move but without feeling trapped.

- Openness/closure

  The day-and-night sections are spatially open. While offering overall views to the staff, it avoids patients feeling of being watched.

- Privacy/sociability

  The hospital provides spaces for social interactions, activities, meetings, and collaborations between the users, while offering private and intimate spaces for seclusion and contemplation.

The Helsingor Psychiatric Hospital is organized into two main programs: living and treatment. These two programs consist of multiple different and individual functions that must work together. Each program is carefully designed and then transformed into an integrated, differential whole (Karlin and Zeiss, 2006).

Figure 13 The lawn stretches over the roof

Figure 12 Walls made of glass, wood and concrete

The living program blends into the landscape at lake level. A clover-shaped organizing structure is applied to the living program so that each inpatient unit has its own connection to the landscape. Two sets of rooms face the lake, and one set of rooms face the surrounding hills. Apart from the inpatient units, the living program includes a collective space, six small sunken gardens and several offices, populated by small patios (Figure 11). On the other hand, the treatment program is organized into five single or double story individual pavilions, radiating from the center of the clover structure (Figure 12). All parts of the building are fused at one single point, resembling a snowflake structure (Figure 13). In day sessions, outpatients' clinic and department of district psychiatry gather around the arrival areas; individual pavilions including treatment spaces and offices are placed to one side and waiting areas to the other side. The galleries of the treatment program grow along the individual pavilions, varying in lengths according to the size of individual pavilion.

Figure 11 The living program plan

Figure 10 The treatment program plan

Figure 9 Snowflake structure

Case 2: Kronstad Psychiatric Hospital

Architects: L Origo Arkitektgruppe/ Location: Bergen, Norway/ Project year: 2013

Figure 14 Kronstad Psychiatric Hospital

Figure 15 Kronstad Psychiatric Hospital

Located in a high traffic area of Bergen, the design of the Kronstad Psychiatric hospital focuses on the openness and transparency towards the public, as well as the protection of patients. Nature and city views are main elements in the design. This 12,500 square meter building includes inpatient departments with several gardens for recreation (Figure 14) and outdoor activities (Figure 15) on upper floors. Lower floors include daycare, policlinics and underground parking.

The public square at the north of the building is one of the creative design features of Kronstad (Figure 16). Surrounded by city traffic, the square stretches under the building, inviting the patients and staff while also welcoming the general public. Citizens can sit, talk and play outside in the square; at the same time, the big windows on the facades display this busy outside world for the patients inside the building to view, strengthening the idea of openness and transparency of mental health issues. The white façade symbolizes stability, security, and home. Three atriums, located on the east side of the hospital, open up towards the view of mountain Ulriken, adding sunlight, air, nature views, and outdoor recreational spaces to the building

(Figure 17). Each department has its own roof garden, which encourages social interaction and activities, and also provides places for contemplation in nature (Figure 18).

The layout emphasizes the clarity of the structure. Floorplans are clear and logical to enhance communication, circulation and management within the hospital. The main entrance connects to the light rail stop, which offers direct access for all the departments. Special designs supporting the security and safety of patients and staff are embodied in the window and stair designs. Living units are designed to give staff a clear overview, reducing patients' feeling of being watched (Cooper and Naomi, 2013).

All the solutions are meant to enhance the patient's feeling of openness, transparency and safety, as well as create a positive environment for patients and staff.

Figure 17 The square at the north of the building

Figure 18 The atrium opens to the view of mountain Ulriken

Figure 16 Kronstad Psychiatric hospital section

Case 3: Forensic Psychiatric Clinic

Architects: BSK Arkitekter/ Location: Stockholm, Sweden/ Project year: 2012

Figure 19 Forensic Psychiatric Clinic

The design of the Forensic Psychiatric Clinic balances the stringent demands of safety, fire, details, healthcare environment, and patient/ caretaker relations, against its relationship with society. The building is located on top of a hill, where most natural areas remain intact (Figure 19). The administrative and clinical bodies face the nearby urban community, enabling the inpatient environments to face nature (Bengtsson and Grahn, 2014).

Five main focal points are designed into this modern healthcare and working environment. 1) Safety: a 6-meter-high wall surrounds the whole facility, to keep patients from escaping (Figure 20). However, the walls are barely visible, because of the hospital's hilltop location. Devices, such as alarms, cameras, and lighting, also help enhance the safety of the environment. Additionally, the topography is an obstacle to escape; the undulating mountains covered densely with pine trees. 2) Logistics: the program encourages collaborations between staff and interaction between patients while separating certain patient groups (Carol, 2013). Extra care is applied to main circulation ways and points, such as gallery, employee courtyard, stairwells, and ward-offices. 3) Living environment: patient living environments should be calm, clear, and robust; much care has been placed on details, materials, and technical installations; natural

materials are used in all interior spaces to strengthen the characteristics of each room. 4) Social environment: social environments for patients and staff include the shared facilities between and within the wards that are designed for a variety of social activities and interactions. For instance, every four patient wards share a “caretaker plaza” in the middle, where patients and staff can meet to encourage knowledge-sharing (Figure 21). The employee courtyard is a meeting place for conversation, work, and rest (Figure 22); the large atrium at the entrance is accessible and visible throughout the entire administrative and clinical areas (Figure 23); coffee machine, cafeteria, conference rooms, and gym are located immediately off the atrium, strengthening collaboration, cooperation and interaction among the coworkers. 5) Nature: this hospital is placed between islands of rock and forest with views towards all the directions.

Figure 23 6-meter-high wall around the facility

Figure 22 First-floor plan

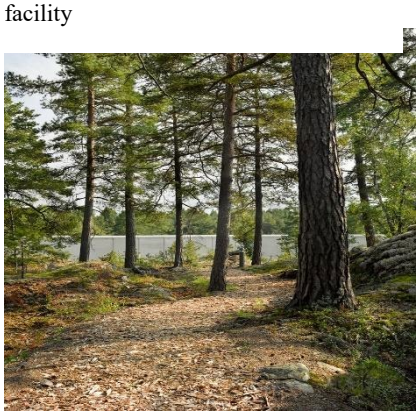

Figure 21 Employee courtyard

Figure 20 Large atrium

Case 4: Vermont Psychiatric Care Hospital

Architects: architecture+/ Location: Berlin, Vermont/ Project year: 2014

Figure 25 Vermont Psychiatric Care Hospital

Figure 24 Site Plan

The new Vermont Psychiatric Care Hospital (Figure 24) places importance on promoting healing and reducing aggression in patients. Arranged around two courtyards (Figure 25), the hospital presents a quiet and dignified suburban setting. It treats patients suffering from diverse mental illness offering a safe and therapeutic atmosphere within the aesthetic of traditional Vermont cottage style design (Bengtsson and Grahn, 2014).

The administrative and clinical parts of the hospital are clad in brick, while the inpatient wings are sided with wood to distinguish the difference between front house formality and back house domesticity. The single-story structure of the building promotes a campus feeling, providing natural lighting, airy environment and access to outdoors (Figure 26). The facility offers twenty-five private bedrooms with en-suite bathrooms in small, flexible living units, maintaining privacy, reducing stress, decreasing the sense of being watched, and promoting patient healing (Figure 27). All rooms, including wards, treatment spaces and offices, are equipped with operable windows to allow patients to control their own environment, which, in turn, also reduces stress. Living rooms, quiet rooms, comfort rooms, and generous on-unit dining areas are directly connected to the bedroom wings. A broad range of recreational activities are

accommodated, including a library (Figure 28), fitness room, greenhouse, chapel/ court, art room, and visiting rooms. Two courtyards provide spaces for outdoor activities, and function as enclosed village for patients and staff. The first courtyard is for quiet activity and contemplation; the second one, with a track and basketball court, is more active (Figure 29).

The interior design uses natural Vermont materials and elements, reinforcing the sense of the location. Locally harvested stone and hardwoods are prevalent throughout the spaces. The combination of finish materials and colors are designed to promote soothing and restorative feelings. Linoleum is laid in a color pattern to mimic a creek flowing down the living units' corridors with arriving "docks" at each bedroom door. Each inpatient unit is themed by a season of the year with related colors and iconic elements. Nursing stations are released from separate rooms to corridors, increasing the eye contact between the patients and staff. The furniture is cozy while safe and durable, blending with other interior design and wayfinding systems.

Figure 27 Campus feeling

Figure 28 Living unit

Figure 26 Courtyard

Figure 29 Library

In conclusion, we can summarize from the case studies above that best design practices of psychiatric hospital design today are to create a peaceful, natural and healing environments for patients, maximizing openness, freedom, privacy and sociability; simultaneously, create an efficient, organized, collaborative working environment for staff. Natural elements have become one of the most important design features as nature positively effects the recovery and the well-being of the patients. Privacy, a controversial topic, needs to be addressed deliberately to ensure the safety of the patients. Inside functions should become an extension of the community outside to help patients quickly adapt between the two environments. Architects must have the opportunity to design a healing wonderland for people to treat their mental traumas and help them become independent and happy.

5. INTERVIEWS WITH PSYCHIATRIC PATIENTS

Currently, principles and standards for the best practices of mental health facility design are limited. This chapter consists of interviews with psychiatric patients of Beijing Anding Hospital regarding their perspectives about the hospital design conducted by the author, as well as the users interview study by others. The responses to the interviews reveal the opinions of what the users feel they need and want, which, in turn, could drive best practices of mental healthcare facility design. The interview study sought to identify what design features can have a positive effect on patients and staff;, what kinds of design should be considered as inappropriate; how different design features can affect patients and staff; what are the design failures of most of China's psychiatric hospital; and finally, how to promote a sustainable and therapeutic experience for patients of psychiatric hospital in China.

Interviews with ten psychiatric patients from Beijing Anding Hospital:

Since patient interviews regarding their opinions on psychiatric hospital design are not available, the author conducted ten interviews with ten psychiatric patients of Beijing Anding Hospital. Beijing Anding Hospital is considered one of the best psychiatric hospitals in China and has been a stet of practice for many psychiatric hospitals there. The patient participants are aged from 18 to 45 and their residence on the wards was more than one month. Interviews were conducted through phone calls and live videos. Each interview included nine questions; a five-point anchored Likert scale was employed ranging from 5 "strongly agree" to 1 "strongly disagree". Additionally, the interviews included a free conversation with patients about their opinions towards the hospital design and environment. All the participants preferred to remain anonymous. As the interviews sometimes included long responses, this thesis translates them

into the seven major patient concerns and how, in the patients' opinions, hospital conditions can be improved.

Prison feeling:

This was the main patient complaint. All interviewees responded that they had a strong feeling of being in prison. The iron doors were always locked, telling them they were confined; behind one locked iron door, there was always another one, to prevent them from escaping, spreading a sense of hopelessness; the only furniture was iron beds that further contributed to prison look; windows indicated that they were in prison too, since the windows were separated into many small sections by dark iron mullions, making patients feel as though they were peeking outside prison bars. Fifty percent of the interviewees believed that the design concept of this hospital contributed to feeling of torture. All of the patients had lied to their doctor about their real feelings so that they could be released from the hospital sooner. Fifty percent also claimed that cast a dark shadow over their lives.

How to improve:

The interviewees suggested that the iron doors between different functions in the inpatient's zones should be taken down. The entrance door of the inpatient zone could be kept, but the material and color must be softened, and include a window on the door to inform them of what's going on outside. The finish material of the beds should be wood as the iron makes the beds cold and unwelcoming; the hooks should be removed as sixty percent of patients don't have violent issues. Windows should be larger and without mullions to provide nice views to the outside.

Lack of privacy:

Most of the interviewees (70%) considered the lack of privacy as the second most important issue. Bedrooms were designed for 10-15 people and felt overcrowded; with their action watched

by others, they felt embarrassed and extremely inconvenienced most of the time. There was no private space for them to deal with their emotions or have an intimate talk with friends. There was only one large bathroom for all the patients, and bath time was only once a week; half of the patients (female) found the lack of privacy affected their living quality; one claimed that outside the hospital she typically needs two showers a day to feel clean.

How to improve:

All the interviewees wished to have a private bedroom, a place where they could feel safe and would not be watched by others. They also suggested that they would want simple pieces of furniture, such as a nightstand, bedside lamp, reading table or chair. Seventy percent preferred a private bedroom with en-suite bathroom, so they can get shower whenever they want.

Lack of entertainment:

The only place for patients to entertain was a small activity room with a TV and pool table; play time was only two hours a day. Patients stayed in their bedroom ward for the rest of the time. Seventy percent wanted to get exercise every day; Thirty percent wanted to draw, write or sing every day. The entertainment activities were too limited. In their daily living, fifty percent simply changed from sitting in the bedroom to sitting in the activity room.

How to improve:

They patients wished to have dedicated activity rooms room, such as a gym, drawing room, dancing room, singing room, movie room, and chess room. They also reported they should be allowed to use these rooms at any time they want. They wished to be provided with a table, pens and papers in the wards so that they could write and draw. The patients fell these activities would help them to recover quicker, feel good about themselves, promote their well-being, and keep them alive.

Color setting and decorations:

The color theme of the hospital was gray and white. The floors, walls, ceilings, beds and beddings, lights, and windows were all in dull grey and white, making them feel endlessly bored. There was no decoration in the hospital, providing them with no healing atmosphere.

How to improve:

Ninety percent wished to have more colors in the surroundings, but according to the interviews, there was no preference on their favorite color, although blue and red were mentioned by interviewees. Patients suggested that every room should have decorations, such as plants, artworks, maps, sculptures, curtains, carpets and wallpaper. One patient mentioned a desire to have a big, soft pillow so she could hold it when she felt sad and unsafe.

Cannot go outside / no view from outside:

Since the hospital is located in a busy urban setting and wards are on the 2nd to 4th floors, no one is allowed to go outside. All windows face the courtyard of the hospital, but the courtyard was an active construction site, and no one even wanted to stand beside the windows. All the balconies were locked. Half of the interviewees felt constrained and stressed under these settings. They felt they were stuck in a gray box.

How to improve:

Interviewees understood that they could not go to the actual natural environment in the hospital's urban setting but felt they should at least be able to go outside into the courtyard or on a balcony to enjoy sunlight and fresh air. The courtyard should be renovated into a garden with benches and leisure facilities.

Poor hygiene of the bathroom:

All the interviewees complained about the discomfort of the communal bathroom. The state of the bathroom had largely compromised the quality of their lives. The plumbing fixtures were always dirty and in disrepair. The bathroom floors were always dirty, wet and slippery. Fifty percent of the interviewees (female) claimed that they were very reluctant to use the bathroom, and they felt that they would get an infection or even smell bad after using the bathroom.

How to improve:

Interviewees had already reported that they preferred a private bedroom with en-suite bathroom. They also suggested that the hospital could hire more cleaners to clean the bathroom every few hours; if they were not allowed to get private a bathroom, simply installing more bathrooms could help fix the issue.

Lack of control:

Interviewees were unable to adjust windows, lights or the ambient temperature of their wards. For safety, lights remained on all night, which harmed the quality of their sleeping. Patients could only gain access to the activity room at certain times (two hours a day) depending on the nurses and were required to stay in their bedrooms for the rest of the day. Patients didn't understand why they were not allowed to recreate whenever they wanted during daytime.

How to improve:

Patients suggested that if they could have their own bedrooms, they could feel more of a sense of controlling their own living environment. Hospital should get rid of the iron doors between the activity room and bedrooms and let them decide when they want to recreate.

Users interview and questionnaire study in journal article "Design in mind: eliciting service user and frontline staff perspectives on psychiatric ward design through participatory methods":

The study was approved by the Bexley and Greenwich ethics committee. Data collection took place in 2012–2013 in four 18-bed adult acute wards in a large inner-city NHS (National Health Service) Mental Health Trust. The criteria for patient participation included presence on the ward for at least three days. The criteria for patient participation included working on the ward for at least four weeks. Ten patients and ten nurses participated in the interviews. Fifty-three patients and sixty-one staff joined the questionnaire phase. The patient questionnaire includes 19 items, while the staff questionnaire includes 21 Items were divided into different categories, such as communal areas, bathrooms. A six-point anchored Likert scale was employed ranging from 1 "strongly agree" to 6 "strongly disagree". The total scores were computed by summing the corresponding items, with higher scores indicating negative views. Eight items were identical across both questionnaires which enabled direct comparisons of staff and patient views. For each category, comment spaces were provided to record additional qualitative data (Szántová and Rychtáriková, 2015). Additionally, patients were provided a point-and-click digital camera to take two photographs representing the best and worst aspects of the physical environment of the ward; and they were asked to briefly describe their photographs. This thesis mainly discusses the qualitative results and the photographic study. Patient and staff demographic data, patient and staff characteristics and their associations to ward perceptions, analysis of identical items between two measures, Staff and service user qualitative data are included in the appendix.

Shared concerns between the two groups:

Participants from both groups considered their surroundings too institutional, "mentioning features such as "standard issue" bedding and "washed out" color on the walls, which – as one service user put it – contribute to "a very uninspiring 'what needs must' form of environment" (Szántová and Rychtáriková, 2015). *Both groups hope to see more artwork in the ward and patients believed that a "brightening up" of the ward will have a positive impact on their well-being. Still, some participants also pointed out that adding artwork may not be enough to improve their experience in the ward.*

Hygiene and maintenance:

The communal bathroom is the main focus around hygiene: several participants complained about facilities in disrepair, overcrowding, mess and fear of infection. Bathrooms and plumbing fixtures are difficult to keep clean, due to the ratio of patients to bathrooms in each ward – one bath for 18 people. Patients also claim that they were reluctant to use the bathrooms due to its condition, worrying about hygiene problems. Furthermore, some patients suggested that having communal bathrooms in an acute ward makes it difficult to maintain hygiene standards.

Patient concerns:

Lack of control and of autonomy were two of the pervasive concerns. Users were unable to adjust the ward appliances and fixtures such as windows, lighting, showers, and heating. Lack of access to the TV remote was also frequently reported. The locking of rooms was another major concern given that patients could only gain access to bedrooms or bathrooms depending on the nurses. At the same time, patients felt extremely vulnerable if their bedroom locks were damaged.

Staff concerns:

Staff frequently complained about the lack of spaces for therapeutic or leisure activities. They considered that it could cause certain problems for running the ward, as it could interfere with patients' needs for privacy and confidentiality and therefore interfere with their ability to carry work with patients; it could also limit patient choice and compromise the living quality of the ward.

Photographic study:

The most frequently photographed areas were the bathroom facilities, the dayroom and the private bedroom. Bathroom photographs were overwhelmingly negative (88%), while dayroom and bedroom photographs were mostly positive (85% and 83%). In the interviews, patients mentioned their preference for private bedrooms, spacious facilities and bright, comfortably furnished dayrooms. Fifty-two percent of the negative photographs focused on lack of maintenance and poor hygiene.

Conclusions from both the interviews with psychiatric patients from Beijing Anding Hospital (study 1) and users' interview and questionnaire study by other researchers (study 2):

There is no obvious difference regarding complaints on design features between the two sets of interview studies; the comments mostly focused on the feeling of being in a prison, poor hygiene, the lack of control, the uninspiring color setting, and the lack of decoration within the two interview studies.

Based on both interview studies, this thesis summarizes good design practices as follows. 1) Openness should be addressed in the design as much as possible to mitigate the patients' feeling of being in a prison; easy access between different spaces must be gained by patients. 2)

Wards must be well-furnished with colorful and comfortable furnishings, as well as interesting decorations, to make patients feel at home. 3) Well-furnished private bedrooms with en-suite bathrooms should be provided, while extra effort must be made to prevent patient suicide or self-harm in the private spaces. 4) Activity rooms should be provided to offer more entertainment and leisure activities for patients. 5) Outdoor spaces must be provided to enhance the well-being of patients. 6) Bathrooms should be equipped with adequate well-functioned plumbing fixtures to reinforce the quality of living in the wards (if no private bathroom could be provided); extra effort should be made to keep the bathroom clean. 7) Certain controls for lighting, windows, doors, TV, and air temperature should be accessible to patients. 8) Every space needs to be open and large to improve the quality of life.

However, this thesis finds that the responses from study 2 appear to be more positive than those from study 1 due to the worse conditions of Beijing Anding Hospital than the mental healthcare facility analyzed in study 2. The differences, as well as the reasons for these differences, are discussed as follows. 1) Patients of study 2 did have private bedrooms, yet patients of Beijing Anding Hospital had to share a bedroom with other 14 people, resulting in a much higher dissatisfaction with the lack of privacy in study 1 than study 2. 2) The photographic study of study 2 shows a high satisfaction rate of the bright, comfortably furnished dayrooms; contrasted with the dayroom (activity room) of Beijing Anding Hospital that was small and poorly decorated, the patients considered it as one of the major failures of design in study 1. 3) Few complaints were found in regard to the outdoor area in study 2, except the female patients' report on the messiness of the shared garden with male patients; given that Beijing Anding Hospital didn't provide patients with an outdoor space, the dissatisfaction concentrated on the lack of outdoor space in study 1. 4) Both groups of patients mentioned that the ward was like a

prison, but they were talking about the different “kinds of prison”. Though the category “the ward is like a prison” got the highest score (most negative) in study 2, no detailed comments on “in which ways the facility look like prison” was found in its qualitative data; this thesis understands that the facility did not resemble a prison; patients described it as a prison because they lacked certain controls, privacy and access; Beijing Anding Hospital was actually designed like a prison, the window with thick framing, the beds with restraints, the locked iron doors, and bedroom wards for 15 people.

By analyzing the two studies and identifying the differences between them, this thesis gains a better understanding of what design features can have a positive/negative effect on patients and staff. In particular, this thesis examines the design failures in Beijing Anding Hospital, as well as in most psychiatric hospitals of China (since Beijing Anding Hospital is one of the models for practice among the psychiatric hospitals of China). These studies contribute to the foundation of promoting a sustainable and therapeutic experience for patients in psychiatric hospitals of China.

6. METHODOLOGY

Introduction

The overall purpose of this thesis is to explore better architectural design practices for psychiatric hospitals in China, focusing on promoting a sustainable and therapeutic experience for psychiatric patients in hospitals there. To find better design practices and ensure the feasibility of these practices, this chapter outlines the research methods defining the main focuses of study for the research. Specifically, this thesis selected a typical hospital sample in China to understand psychiatric hospital development in China; conducted comprehensive literature reviews to find a guidebook for the research; researched history and trends of psychiatric hospitals to explore the design direction, studying advanced design cases to learn better design solutions from these appropriate or relevant examples; documented self-observations of the psychiatric inpatient settings in China to provide firsthand qualitative data; conducted interviews with psychiatric patients in China and examined other interviews conducted by former researchers to attain more qualitative data; analyzed the qualitative data to fully understand patients' demands; and finally drew conclusions on different research topics to create simplified results. These research methods are partly based on the methods documented in the literature reviews of the thesis.

Defining the main focuses of the research

To research more efficiently and productively, this thesis defines several main study areas. As this thesis emphasizes enhancing the patients' experiences, ward zone design, including individual ward design, and the necessary facilities and the functions, become the most

important topics in the discussion. In addition, since the first impression of a hospital on patients can also largely affect patients' feeling towards the hospital and the subsequent treatment, the façade design of the hospital becomes another main issue. Further, due to the influence of the natural environment on the recovery process of patients, this thesis also lays importance on the location selection and the hospital's situation in the natural environment.

Selecting a typical hospital sample in China

To better understand the situation of Chinese psychiatric hospitals, this thesis selected a typical hospital sample in China and observed it thoroughly. Beijing Anding Hospital was selected for the following reasons: 1) Beijing Anding Hospital is considered one of the best public psychiatric hospitals in China and has therefore been used as the design model for and is representative of many other psychiatric hospitals in China. 2) The author of this thesis had been incarcerated in Beijing Anding Hospital for one month in 2016 and experienced and witnessed the situations and inadequate designs of the hospital described herein. 3) The author's deep understanding of Anding informs the methods that can be applied to create a better design practice. 4) The study of inpatient zones of other psychiatric hospitals in China was not possible as the author had no permission to visit these places.

Conducting comprehensive literature reviews

To find a guidebook for the research, the thesis identifies 51 references from several databases and conducts closer examinations on 26 literature sources concerning four domains: 1) users' perspectives; 2) design features; 3) employed methods; 4) outdoor environment. All the resources are published from 2005 to 2017. The literature reviews provide the thesis with

comprehensive background information of psychiatric hospital development, methods and advanced design practices, as well as interview data. It shapes the research methodology, interview scheme and the design decisions of the thesis.

Researching on the history and trends of psychiatric hospitals

To explore new design directions and philosophies, this thesis studies the history and trends of psychiatric hospital development. The evolution of psychiatric hospitals demonstrates both improper and proper design. The research also reveals the development of cultural attitudes towards the mental illness. To seek out better design practices, architects must avoid the historical design mistakes, follow 21st-century trend, and invent new design concepts to offer a supportive, safe and healing environment for patients.

Studying advanced design cases

To find examples and proof for how architecture can promote a healthier life for psychiatric patients, this thesis examines four advanced psychiatric hospital design cases. Each case study places importance on the following design elements. 1) The location; 2) The building height; 3) Access to nature; 4) The floor plans of ward zone; 5) The furnishings, material and details; 6) The color; 7) The recreational functions in the ward zones; 8) The social environment; 9) The façade of the hospital; 10) The layout and organization of the hospital. Then, this thesis summarizes the main design features and characteristics from these cases. The final design solutions will be partly based on these case studies.

Conducting interviews with patients and examining former interviews

To attain qualitative data, this thesis reports on ten interviews with ten psychiatric patients from Beijing Anding Hospital and examines other patient interviews conducted by former researchers from other countries. Other patient interviews from China have been found and little is known about facility design in the mental healthcare environment in China. The interviews conducted for this thesis were through phone calls and live videos; participants are aged from 18 to 45 and their residency in the wards was at least one month. Each interview included 15 questions; a five-point anchored Likert scale was employed ranging from 5 “strongly agree” to 1 “strongly disagree”; the interviews also included free conversations with patients about their opinions towards the hospital design. On the other hand, the interviews conducted by other researchers consist of opinions from both patients and staff; two sets of questionnaires were handed out among a patient group and a staff group; a six-point anchored Likert scale was employed ranging from 6 “strongly agree” to 1 “strongly disagree”; the opinions and comments from the participants were also included; additionally, this interview asked patients to take two photographs representing the best and worst aspects of the physical environment of the ward and write a brief description of the photos.

Analyzing the collected qualitative data

To fully understand patients’ demand, this thesis analyzes the qualitative data from both sets of interviews. The main complaints are summarized in five areas, and good design practices are summarized in eight areas; moreover, the differences in the results between the two sets of interviews and the reason for these differences are also examined by this thesis. The qualitative

data analyses contribute to the foundation of the final design solutions and must be answered in the final solutions.

Self-observations in the psychiatric hospital

Since the author of this thesis had once stayed in Beijing Anding Hospital for one months' treatment, firsthand qualitative data about the condition of this psychiatric hospital is obtained through the author's self-observation and personal experiences. This method is critical as the author examined the environment, identified the problem, and sought better solutions from both the perspective of an architect and a patient. Consequently, the final design recommendations are more comprehensive and patient-centered. In addition, since mental illness is still a taboo topic in China and related articles, news and pictures are rare, this firsthand data collected by the author is extremely valuable.

Drawing conclusion from the gathered information

To create simplified reviews, this thesis draws conclusions on several research topics mentioned above in their own chapters. The simplified reviews are also designed as a convenience to future researchers.

7. FINDINGS

General findings

The development of psychiatric hospitals is based on the economic, political and cultural environments and how mental illness is viewed by society in different times and countries. The forms of psychiatric hospitals have experienced four main phases of evolution, starting from the prison-like insane asylums to moral-treatment-based new asylums, then to specially designed mental healthcare institutions and hospitals, and finally to smaller, community-based mental healthcare facilities.

To better assist treatment and recovery of patients, the design of mental healthcare facilities of the 21st century tends to appear as smaller, deinstitutionalized settings addressing the individual demands of patients. This thesis summarizes the main design considerations of today's psychiatric hospital development and design as follows:

- Deinstitutionalized and homelike settings:

  Providing a sense of being at home helps patients to feel relaxed, safe and welcome. Psychiatric hospitals need to become a healing bridge between homes and society.
- Sprawling shape with one to two stories:

  This structure allows the demands for natural lighting, an airy environment and access to outdoors, which are important elements in the recovery process.
- Enhancing privacy:

  Private bedrooms and bathrooms are preferred by almost all the patients. Private living spaces maximize the psychological satisfaction and comfort of patients.
- Well organized and maintained environments:

On the one hand, a well-organized and maintained environment conveys a sense of respect for patients (Shepley et al., 2016). On the other hand, it enhances the management of the.

- Access to nature:

  Outdoor environments positively affect the physical and psychological health outcomes of patients and can serve as a resource for recovery and rehabilitation (Bengtsson and Grahn, 2014).

- Attractive furnishings:

  Furnishing design helps reduce the feeling s associated with institutional atmospheres, that is in turn associated with enhancing emotional and intellectual well-being improving patients' behavior (Karlin and Zeiss, 2006).

- Enhancing social interaction:

  Feeling connected to others is important in the recovery process source. Social activities help patients break the feeling of isolation and patients adapt to society more quickly after their stay.

- Providing certain freedom and control:

  Lack of control is one of the pervasive concerns among patients. A sense of freedom and control is part of the recovery, improving the psychological health outcomes of patients.

- Maximizing lighting:

  Daylighting and electrical lighting are important elements in psychiatric facilities. Daylighting is associated with improving good sleep, decreasing aggression and

reducing the length of stay of patients (Shepley et al., 2017). Electrical lighting is associated with enhancing the comfort and safety of users.

- Strengthening safety and security:

  Safety and security are one of the biggest concerns among staff. A well-designed psychiatric environment should reduce the stress of staff due to the potential threat of some violence from patients.

- Noise control:

  Noise is a stressor and has a negative impact on the well-being of patients. Minimizing noise will enhance the treatment and healing of patients.

- Improving hygiene:

  Hygiene problem is one of the main concerns among patients. A bad state of hygiene will largely compromise the quality of their lives.

- Allowing smoking:

  Though smoking is detrimental from a physical health aspect, it creates social and psychological significance among patients and staff, as well as reduces the feeling of an institutional atmosphere.

- Increasing entertainment amenities:

  Many patients complain of a lack of entertainment amenity within psychiatric hospitals. Entertainment is part of the treatment and can enhance sleep quality and help patients adapt to society quickly after their hospital stay.

- Nurse station:

  Nurse station design must balance the supervision of patients and the safety of staff. The decision often focuses on open versus closed stations.

- Preventing suicide:

  Suicide resistance is critical in psychiatric hospital design as psychiatric patients have a higher rate of suicide. Furniture and furnishings must minimize or eliminate the possibility of suicide.

The design considerations listed above reflect the inadequacies of today's psychiatric hospital design around the world. However, the conditions and standard of psychiatric hospital development and design in China is much worse compared to the world. Most psychiatric hospitals in China still look like prisons. Though the Chinese government has made efforts to reverse the situation, the change is slow and difficult.

For Chinese psychiatric hospital development and design, the design considerations listed above can't be fully adopted yet; changes and innovations must be addressed according to the fundamental realities in China. This thesis summarizes some of the main difficulties of Chinese psychiatric hospitals keeping pace with psychiatric hospital development in the rest of the world. 1) Couldn't transform into smaller community-based facilities. 2) Couldn't ensure a high level of privacy for patients. 3) Couldn't provide a selection of entertainment for patients. 4) Couldn't ensure a high level of freedom and control for patients.

This thesis summarizes the reasons of these difficulties as follows. Since there are more than 170 million people suffering from mental disease in China (中环现场. 2015), the demand for psychiatric hospitals and services in China is huge; and as public psychiatric hospitals dominate the Chinese market, the patient population pressure is mainly laid on large public psychiatric hospitals. Though psychiatric hospitals in the rest of the developed world tend towards smaller and more professional community-based facilities, China couldn't follow this trend. The smaller community-based hospitals host about 40-60 beds per 100,000 people in state

psychiatric hospitals (Karlin and Zeiss, 2006); some private hospitals only have 20-30 beds, in contrast in China, there are only about 1650 psychiatric hospitals and 228 thousand psychiatric beds in China (辛闻. 2015), which can be roughly translated to 1381 beds per hospital. Comparing to the 170 million psychiatric patients in China, the number of beds is far from adequate. Also, there is a lack of investment in such facilities in China: less than 1% of the national health budget of China is allocated to mental health care, and therefore China doesn't have the luxury to design and build smaller community-based mental healthcare facilities with a full range of professional treatments and services for each. In addition, since China still must build larger mental healthcare facilities and the investment is always tight, these facilities may not be able to provide private bedrooms and bathrooms and multiple entertainment rooms for patients, which ultimately reduces the desired level of control and freedom by patients.

Other findings

There are no rules or preferred plans for designing today's psychiatric hospitals. Many designers still adopt the linear shape transformed from the old Kirkbride plan; some are using symmetrical plans; Some are designed with several smaller cores with shorter wings radiating from the cores; some are designed as a large building with several courtyards in the middle. The only repeating pattern of today's psychiatric hospitals discovered in this thesis research is that they have short building height in common, usually varying from one to four floors total. However, psychiatric hospitals in China are taller buildings with four or more floors (due to the large demand of beds).

Though the Kirkbride psychiatric hospital plan has been mostly abandoned by architects and psychiatrists, we still find updated versions of such plans in many advanced psychiatric

hospitals, such as the Delaware Psychiatric Hospital Center, Jacksonville State Hospital in Illinois, the Helsingør Psychiatric Hospital in Denmark and Forensic psychiatric clinic of Stockholm.

Limitations of implementing the feasible design practices in China

- Since China is still considered a developing country, it doesn't have the resources to make investment in the development of psychiatric hospitals, the training of professional clinicians, and the related systems and services.
- As the development and design of Chinese psychiatric hospitals lag far behind other countries, there is no academic source addressing the development and design of psychiatric hospitals in China. Though there are a few website sources discussing these issues, the information is sparse.
- Due to primary concerns, the photos recording the condition of inpatient zones, especially the ward zone, of Chinese psychiatric hospitals are rare. In addition, the façade pictures of these hospitals in China are uncommon.
- No users' interview record of Chinese psychiatric hospital design has been found.
- The author as unable to conduct a case study of the inpatient zone at any psychiatric hospital in China.

In conclusion, when we seek design practices for promoting sustainable and therapeutic experiences for patients in psychiatric hospitals in China, our task is tougher than in developed countries. There is no specific rule of design for psychiatric hospitals. Architects can follow the

trends of 21st-century psychiatric hospital development and, at the same time, make adjustments and innovations according to the fundamental realities in China.

8. STARTING POINTS OF RECOMMENDATIONS

After a close examination of the development and trends of psychiatric hospital design around the world, Chinese psychiatric hospitals development, case studies, end users' interviews and related literature reviews, this thesis makes detailed recommendations on different design aspects for Chinese psychiatric hospitals. First, this thesis sets four starting points in the design.

Starting points:

1) Therapeutic environment:

Creating a therapeutic environment is the most critical foundation of today's psychiatric hospital concept. It emphasizes on home-like settings, higher levels of privacy, innovative outdoor environments and activities, natural views, multiple indoor activities, attractive furnishing designs, various relaxing places, clean and sunny rooms, and a higher level of safety and security. Achieving these design goals helps alleviate patients' anxious feelings of staying in a hospital. Proper design promotes a psychological healing journey which will positively affect their recovery, reduce their length of stay, and help them to better adapt to the society after their stay.

2) Cheerful and welcoming hospital façade:

The façade design of the hospital provides the first impression to patients and caregivers, as well as present a face of this hospital to the general public. From observations of the author, the façade of today's psychiatric hospitals in China have an imposing, a formal and boring institutional look (Figure 30, 31,32,33), spreading a sense of stress to the society - especially to patients. Patients are reluctant to go to these hospitals, knowing that they are perceived as different from normal people, and afraid of being

controlled, with a loss of freedom once they are inside. They also isolate patients from society. And the society, in return, discriminates against mental illness. By creating a cheerful and welcoming façade, it gives patients and their caregivers the respect and dignity. Patients will feel relax, relieved and confidence when they come to the hospital, and maybe even willing to stay in the hospital for treatment. Further, it would help alleviate the discrimination against the mentally ill in Chinese society. People will show more respect to psychiatric patients and view mental illness as a normal modern disease but not a creepy incurable sickness.

- Construction and maintenance budget:

  This thesis shows that the investment from the Chinese government to psychiatric hospital construction, medical resources, mental healthcare professional training and related public services and systems in China is limited. When considering the large number of people suffering from mental illness, the investment seems even more inadequate. Consequently, along with creating a therapeutic and welcoming environment, the construction and maintenance budget needs to be reduces to make these hospital designs more feasible and practical. Considerations may include adopting smaller, more efficient layouts, inexpensive materials and structures, energy efficient plans, materials and equipment, durable furnishing and materials.

- Chinese characteristics:

  Chinese culture is well-established and profound. However, with the rapid development of China, traditional Chinese culture is disappearing in modern cities. When exploring design practices for psychiatric hospitals of China, we have the opportunity to embed Chinese design elements into architecture as well as program

design, to make a contribution to the country's cultural heritage. Moreover, Chinese style activities could also help Chinese patients to better acclimate to the new environment. For example, simple elegant wood furniture could be adopted for interior design; traditional Chinese landscape design could be utilized in garden design; bamboo could be applied as a special decoration; activity rooms for traditional Chinese painting and brush writing could be provided as a special therapy; and a Chinese tea room could be provided for social or relaxing space.

Figure 33 Beijing Anding Hospital


Figure 32 Beijing University Institute of Mental Health

Figure 30 Hengshui mental Hospital


Figure 31 Wenzhou Kangning Hospital

9. DETAILED RECOMMENDATIONS

This thesis makes detailed recommendations for 16 design practices, primarily for public Chinese psychiatric hospitals since they dominate the market there.

1) Building shape:

Instead of following the development trend of a sprawling one-story building, this thesis recommends a sprawling four to six-story structure. This sprawling structure ensures meeting the demands for natural lighting and an airy environment. The multi-story design will: One, meet the huge demand for beds in Chinese psychiatric hospitals; Two, will balance the expensive cost of construction and maintenance as it is cheaper to build up than out.

2) Building layout

The physical layout of the building is an important component of constructing a therapeutic and safe environment. As the focus of this thesis is on promoting a sustainable and therapeutic experience for patients, only the layout of the inpatient zone is discussed here. The layout of the building should be continuous without separations, allowing staff to walk around the core of the building and with lines of sight to easily see every bedroom and activity on that floor. The detailed recommendations include: The central building core should contain all the shared functions, such as treatment rooms, main offices, calm room, waiting rooms, and recreational rooms to increase the efficiency of using the building; several residence wings would radiate from the building core; bedrooms should be located on the south and west side of these wings to receive more sunlight, whereas corridors could be located on the north and east side; courtyards would be located between the different

wings to create more outdoor spaces; the south and west side of the building can be devoted to gardens and a greenhouse. (Figure 34)

Figure 34. Helsingor Psychiatric Hospital/ Ellsinore Psychiatric Clinic ‘s garden and greenhouse

3) Façade:

As stated earlier, the façade design of hospital provides the first impression to patients and caregivers, as well as provide a face to the community. Several design strategies can help psychiatric hospitals in China achieve a cheerful and welcoming façade, and set up a positive and harmonious image to the society: using lighter and soothing colors, such as white background with light greens and warm blue decorations, to create a therapeutic feeling; using local characteristic design or decoration elements to help the building fit into the surrounding settings; using bold, less institutional, fashion elements to follow current aesthetic trends; use elements reminiscent of a resort or holiday village (Wood et al., 2015), to help modify the stigma of mental illness; design adjacent areas as city public square to offer a place for citizens to sit, play and be comfortable in proximity to the hospital. (Figure 35)

Figure 35. Kronstad Psychiatric Hospital façade garden.

4) Location:

This thesis recommends three kinds of locations for psychiatric hospitals in China. The first suggested location is in urban settings near residential districts. The interviews with carers showed that a more distant location is not a cost-effective solution for carers (Wood et al., 2013). They prefer hospitals that are near to their homes, so they can visit the patients frequently. The second suggested location is also in an urban setting, close to public transportation routes. Due to the low private car ownership rate in China (30%) (人民网-汽车频道. 2016) (北京青年报. 2005), many people use public transportations to visit their family members in hospitals. The third suggested location is in suburbia. On the one hand, a large site in suburbia allows a sprawling shape of the building. On the other hand, the suburban setting ensures the

access and views to the natural environment, strengthening the therapeutic environment of the hospital.

5) Privacy:

Though high-quality community-based mental healthcare facilities are one of the developing trends of international psychiatric hospitals (Yanni, 2007) (Shepley et al., 2007), China still needs larger mental healthcare facilities to meet the huge demand of patients. Since each facility may receive hundreds to thousands of patients and the investment is always tight, providing private bedrooms and bathrooms for each patient is impractical. Using Beijing Anding Hospital as a typical plan, the average number of beds in a normal ward of Chinese psychiatric hospitals is roughly 10-16. This thesis also collects data from online photos; no academic resources addressing the number of beds in Chinese psychiatric ward has been found). The thesis recommends providing two-bed units and four-bed units with patients in each unit sharing a bathroom. As a result, the construction cost and the building size will be reduced compared to hospitals with private bedrooms and bathrooms; the living quality of patients will be largely improved compared to the existing psychiatric wards in China; with more people in a unit, they can supervise each other and inform the staff if others are acting strange. Private bedrooms should also be available in each hospital to receive patients with severe conditions or special requirements.

6) Natural environment – garden:

This thesis recommends following design practices for gardens in psychiatric hospitals. 1) Safety: no object that could harm a patient or others (such as bigger stones, tree branches, clay pots, poisonous vegetation) is allowed in the garden; gardens must be enclosed 17 with higher shrubs covering the unwelcoming fences to define the garden perimeter; the shrubs should also prevent the risk of intrusion; no dead corner is allowed; it is better to have ramps rather than steps in the garden to help prevent falling; benches, trees, and movable structures should be far enough from fences to prevent elopement. 2) Access: visual and physical access to the gardens should be provided. 3) Enhance interaction: there should be enough seating spaces to encourage interaction. 4) Provide shade and avoid glare: in addition to general comfort, shade offers protection to patients with sensitivities to UV rays and glare. 5) Exercise: wide paths for walking and jogging, and spacious grounds for exercising are necessary. 6) Orientation and wayfinding (Bengtsson and Grahn, 2014): the routes in the gardens should be clear and easy to understand; with a balance of complexity and simplicity. 7) Locations: gardens can be placed at different locations such as outside, indoors, on roofs, underground and or in courtyards. (Figure 36, 37, 38, 39)

Figure 37. Kronstad Psychiatric Hospital's garden.

Figure 38 Kronstad Psychiatric Hospital's garden.

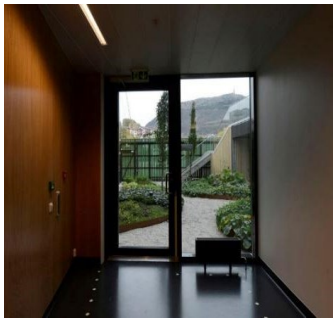

Figure 36 Kronstad Psychiatric Hospital's garden.

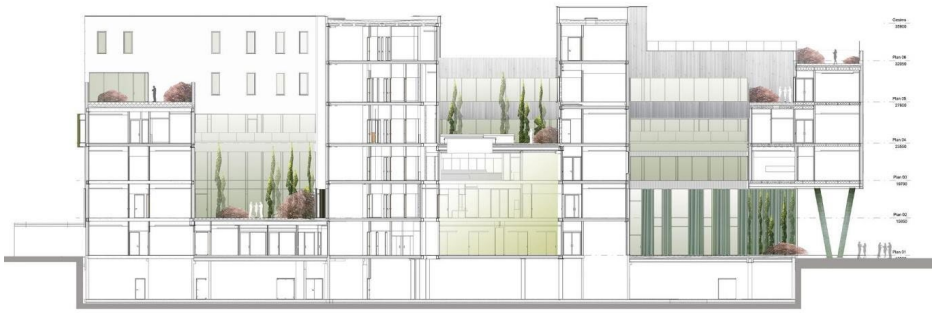

Figure 39 Kronstad Psychiatric Hospital's gardens.

7) Natural environment - horticulture:

Though horticulture therapy hasn't been certified as an official treatment in curing mental illness, it has been proved to have the ability to relieve stress and help the human brain to rest and recover from mental fatigue (Vujcic et al., 2017). This thesis recommends combining the horticulture therapy concept with the psychiatric hospital design to enhance the therapeutic atmosphere, incorporating a large garden and greenhouse. Patients would participate in activities in these gardens to improve their moods. The gardens and greenhouses should be placed on the south or southwest side of the building (in the northern hemisphere), or to face the prevailing wind. In this way, the gardens will be able to receive a maximum amount of sunlight and the air filtrated by the garden can be brought into the rooms by the prevailing wind. In addition, the gardens and greenhouses should be located close to the building to enhance connections between patients and nature (Maecus and Sachs, 2013). Patients should be able to experience the gardens simply by opening the hallway doors; and could enjoy the sight of a garden while sitting in their rooms. The greenhouse could

attach to the building to serve as a thermal break during the winter to enhance the energy performance of the building.

8) Natural environment - wildlife:

Due to the poor environmental conditions of most cities in China, wildlife is disappearing rapidly. Some species have already died out; and some are nearly extinct; Embedding a wildlife protection scheme into a psychiatric hospital can positively affect the recovery of patients, as well as encourage the wildlife to return to the urban environment (Carol, 2011). This program could offer patients various outdoor activities and benefits for health. Patients could help staff to provide food and build shelters for wildlife; they could play with wildlife or simply enjoy having the wildlife around. The program would not only promote a sustainable life and therapeutic environment for patients, it would also create an opportunity for sustainable development of wildlife. In addition, it could increase the interaction between patients, patients and staff, and patients and their families. Furthermore, it could educate patients and staff on wildlife sustainability. To launch this program, gardens with carefully designed landscapes should be close to the building to provide patients with easy access to wildlife; It is advisable to use ramps rather than steps to connect the building and the gardens; Patients should be able to watch this wildlife garden from different rooms and hallways within the building; bird tables, birds' feeders, hedgehog homes, and small water ponds should be visible from different rooms. Construction of this program should be easy and quick.

9) Social interaction:

Social interactions break the feeling of isolation and lower stress among patients. They can be achieved through several methods including: 1) Seating areas should be provided liberally within the building. 2) Well-designed dayrooms (with comfortable furniture, TV, pool table…) offer a place for patients to gather, they should be placed in several locations near the wards to reduce overcrowding (the number of patients in Chinese psychiatric hospitals is huge). 3) Gardens create extra activities and a relaxing atmosphere and should be located in different areas of the hospital. 4) Entertainment halls and activity rooms can provide gathering spaces for patients and staff to have fun, improve personal skills, communicate and cooperate; they should be located in space central to the wards. 5) Smoking spaces can act like a sanctuary for patients, they tend to talk more during smoking (Wood et al., 2013).

10) Entertainment rooms:

Life inside a hospital doesn't have to be boring and dull. Patients have different hobbies and interests and psychiatric hospitals should be a place to encourage patients' pursuits. Hospitals should provide entertainment activities that can accelerate the recovery of patients. Entertainment rooms could include: a gym, an art gallery or special rooms for pottery, games, sports, billiards, dancing, singing, art or reading. Many of these rooms could be in outdoor spaces or combined into larger halls placed at the center of the wards. Unfortunately, entertainment activities provided in psychiatric hospitals in China is limited, possibly due to budget issues. When making final decisions, we must balance patients' demands and budget.

11) Attractive interior furnishings and colors:

Deinstitutionalization is one of the biggest developing trends for 21st century psychiatric hospitals. To make hospitals more like homes, interior furnishings and colors can add playfulness to the environment (figure 39). In the interviews, most people mentioned they would like to see red and blue in the hospital. Though there was no specific preference of patients for color, lighter colors and warm blue tones are recommended to create a positive and soothing atmosphere in the hospitals (Karlin and Zeiss, 2006). Different types of furniture, decorations, paintings, sculptures, curtains, carpets, floors, ceilings, wallpapers, shelves, plants and lights can be provided in hallways and rooms. (Figure 41 & 42)

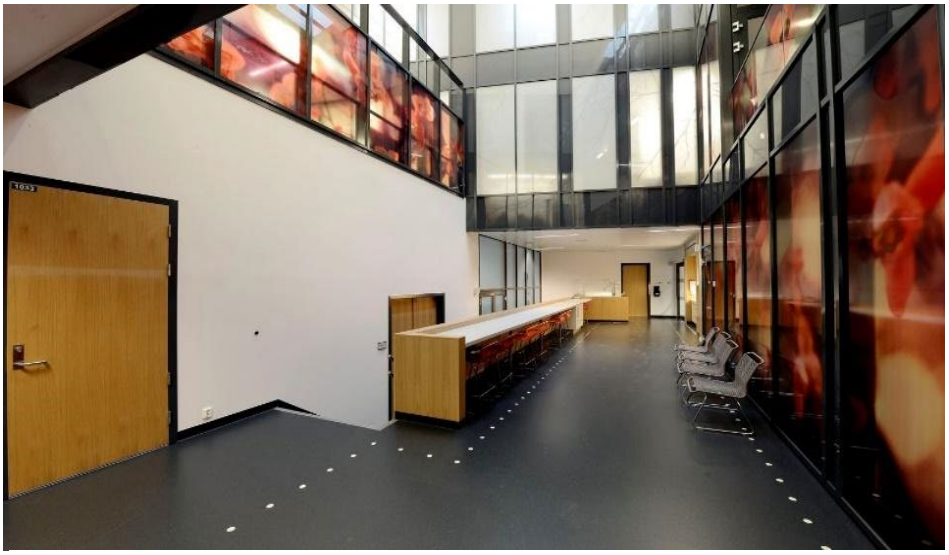

Figure 40 Forensic Psychiatric Clinic's hallway.

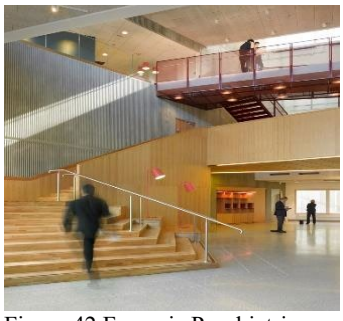

Figure 42 Forensic Psychiatric Clinic's lobby.

Figure 41 Forensic Psychiatric Clinic's meeting space.

12) Lighting:

Both daylighting and electrical lighting can elicit a strong human biological response and therapeutic effect (Szántováand Rychtáriková). Daylighting is important for the recovery and rehabilitation of patients, as well as the well-being of staff (Iyendo et al., 2016); Electrical lighting can enhance the biological feeling and feeling of safety of people. To maximize daylighting, a large atrium can create a light well to invite sunlight to each floor; window sizes should be bigger; light-reflecting fixtures can be installed on the ceiling; the wards should be located on the south side; shading devices should be provided outside the window to avoid glare and excessive illuminations. In terms of interior electrical lighting, except to reach the healthy indoor light condition. it should be flexible to provide variable lighting levels based on different activities and time of the day; exterior and interior accent lighting should be provided at where it is appropriate. More importantly, the emphasis should be laid on daylighting, as it can improve the energy performance of the building, resulting in a lower utility fee.

13) Noise:

Noise is a stressor and can lead to the worsening of mental illnesses. Even after removal of the source of noise, a permanent perception of that noise can remain in the psyche of the person affected (Szántová and Rychtáriková). Noise can negatively affect the therapeutic environment of a hospital. The design practices in psychiatric hospitals to mitigate unwelcome noise usually include: using double or triple glazing, plants, the building structure, sound absorbing materials, finishes, walls, floors and

ceilings. In particular, bedrooms, we should need noise abatement. Though single bedroom units are recommended in many articles, they are not possible or typical in Chinese psychiatric hospitals; however, there are options to reduce noise for shared bedrooms. Lounges, utility rooms, dayrooms, and entertainment rooms that generate noise should be located away from bedrooms; beds should be located away from corridors (Iyendo et al, 2016); and gentle soft background music can be played in hospitals to cover other disturbing noises.

14) Smoking room:

Though allowing smoking in psychiatric hospital is a controversial topic, this thesis considers it is necessary to design smoking spaces for hospital patients and staff. Smoking has been found to enhance the psycho-social well-being of patients and staff and, for those who smoke, they contribute to the 'therapeutic landscape' of the hospital (Wood et al, 2013). Smoking creates a sense of control over patients' dignity, which diminishes the institutional feeling of the hospital. In addition, smoking enhances interaction between or among patients as they tend to communicate more during smoking. Smoking spaces should be restricted to outdoors and should be far away from building (still within the hospital perimeter) to prevent emergencies caused by fire; special smoking shelters should be provided, but without furniture to prevent smokers from lingering too long in the shelters. Such planning informs the patients and staffs that smoking is allowed but not encouraged. Moreover, cameras should be provided at the shelters to ensure the safety of the smokers.

15) Safety and security:

Safety and security are important aspects of creating a therapeutic landscape within psychiatric hospitals. Patients' safety and security issues include but not limited to: patient's escape from the hospital; suicide; the potential of self-harm; violent behavior among patients; accidental injuries or falls (Wood et al., 2013). Staff safety and security issues mainly focus on patients' aggressive and violent behaviors towards them, such as throwing furniture, punching, spitting, scratching, verbal abuse or pulling hair. To ensure the safety and security of both patients and staff, the following design practices are recommended: the circulation of the hospital should be simple, clear and wayfinding; the layout should be open without unnecessary barriers; over-crowding should be avoided; courtyards should be used instead of fenced outdoor spaces; visibility of patients should be provided from staff offices and other; glass partitions can be utilized for maintaining visual sightlines (Figure 43); no dead corners allowed; CCTV should be the main method of surveillance instead of patrol covering every corner of the inpatient zones, except bedrooms and bathrooms; objects that can be used as weapons should not be allowed; protrusions should be eliminated; open balconies should be eliminated; abuse resistance alarms should be provided throughout the inpatient zone; windows should be double or triple glazed; the building and finish materials should be able to resist the special stresses to which they will be subjected when patients vent their feelings on their surroundings (Wood et al., 2013).

Figure 43 Helsingor Psychiatric Hospital/ Ellsinore Psychiatric Clinic's glass interior wall.

16) Nurse station:

Design practices debate open versus closed nurse stations. Considerations for an open station include enhancing the communications between patients and staff and creating a welcoming atmosphere for patients. On the contrary, there could be safety issues with open stations in the event of patients' aggressive behaviors to staff. This thesis recommends placing an open nurse station in front of a closed one. The open station would serve more as a reception desk, but both sides of the open nurse station would connect to the wall behind to prevent patients' intrusion into the station; staff can observe patients or do routine works, such as patient check-in and out, at the open stations during normal times; when they need to do work that requires concentration, they could retire to the closed station; if a patient start to act violently, staff can run into the closed station quickly and wait for help; patients' records, files and other equipment would be stored in the closed station at behind, along with resting spaces. This arrangement strengthens the communication between patients and staff, conveys

an image of welcoming to patients, improves work efficiency, and reinforces the safety of staff. (Figure 44)

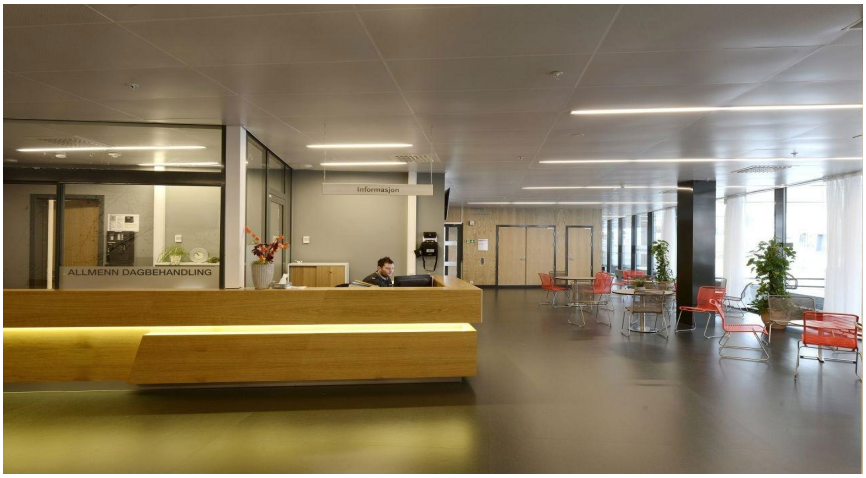

Figure 44 Forensic Psychiatric Clinic's nurse station.

10. CONCLUSION

This research thesis makes recommendations for ward zone design of psychiatric hospitals in China. It is based on extensive literature reviews, a history and trends study, observation by the author, case studies, and user interviews. While the recommendations are based on the results of the thesis research; neither hospitals nor architectural designers have reached agreement on how psychiatric hospitals should be designed in China.

Architecture provide organizational life, interactions and activities. Due to the special issues and situations associated with mental hospitals, the building and site designs must be specific to the users they serve. Mental health facility designers must work deliberately with psychiatric patients and their families, professional clinicians and hospital leadership to determine the best practices for ward zone design of psychiatric hospitals, throughout the design and construction phases.

Often, mental healthcare facilities will have policies and regulations to guide design decisions; however, in China, as the information and photos of psychiatric hospital design are fairly nonexistent, adding to the difficulties of making appropriate design recommendations for psychiatric hospitals there.

Finally, the author looks forward to continuing research, as well as translating these efforts into real psychiatric hospital design projects in China.

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