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Epidemiology and treatment of mental disorders in a rapidly developing urban region in China

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CHAPTER 1

General Introduction

THE BURDEN OF MENTAL DISORDERS

Mental disorders are a large burden for patients and their families and impose high costs on societies as a whole^{1,2}. People with mental disorders are facing a decreased quality of life, educational difficulties, lowered productivity and poverty, social problems, vulnerability to abuse, and additional health problems³. In addition, families and caregivers of individuals with mental disorders are often unable to work at full capacity due to the demands of caring for a mentally ill individual, leading to decreased economic output and a reduction in household income in countries with insufficient healthcare and/or unaffordable healthcare⁴. Family members may also experience significant and chronic stress due to the emotional and physical challenges of caring for a mentally ill family member^{1,2}. Given this burden, mental healthcare research has been focused on gaining better insight into the epidemiology and etiology of mental disorders and, ultimately, on improving treatment and prevention of mental disorders.

GLOBAL MENTAL HEALTH

Much research on mental health has been conducted in Western countries. However, mental disorders are a worldwide problem. In fact, mental disorders have been ranked as the second strongest contributor to disease burden in the world⁵. It is estimated that the global burden of mental illness accounts for 32.4% of all years lived with disability (YLDs) and 13.0% of all disability-adjusted life-years (DALYs)⁶. The global economic burden of mental disorders was estimated at US\$8.5 trillion in 2010 and this economic burden is expected to have almost doubled by 2030⁷. Therefore, The World Health Assembly of WHO approved a 'comprehensive mental health action plan for 2013 to 2020' to promote mental well-being, prevent mental disorders, provide care, enhance recovery, promote human rights and reduce the mortality, morbidity and disability for persons with mental disorders². This plan also refers to the poor condition of the mental health systems in many low- and middle-income countries compared to high-income countries. In the former countries, the mental healthcare systems show lower treatment rates, poorer quality of care, less resources (including staff), financial support and civil and/or societal movements for mental health. Therefore, both the movement for Global mental Health⁸ and the WHO

Mental Health Gap Action Program⁹ advocated scaling up mental health services in low- and middle-income countries.

MENTAL HEALTH IN CHINA

China has undergone rapid economic growth and fast-paced urbanization since 1990s. According to the World Bank, China is currently a middle-income country, although strong income inequality still exists especially between rural and urban regions¹⁰. The quick development over the past decades has been relevant to many social problems, such as growing rates of divorce, alcohol and illicit drug abuse, rising costs of health care, weakening of family ties, increased number of farmers migrating to urban areas for temporary jobs, and as mentioned above, an increased social and economic gap between rich and poor¹¹. These changes have been hypothesized to lead to increased rates of mental illness^{12,13}. Indeed, an increasing trend in the prevalence of mental illness in China has been found¹⁴: mental and behavioral disorders accounted for 23.5% of all YLDs in adults in 2010¹² and China alone accounted for 17% of the global burden due to mental, neurological, and substance use disorder in 2013¹⁵. Realizing the importance of mental health, China has made significant strides in improving mental health services in the past decade which were shown in the first National Mental Health Working Plan (2002-2010) and the latest National Mental Health Working Plan (2015–2020)^{16,17} in order to respond to the call to strengthen and promote mental health from the World Health Organization (WHO). In this plan, China has demonstrated a political commitment to integrating mental health services into its general healthcare system.

The question of whether China can accomplish mental health reform successfully depends on its success in addressing a number of challenges, including, but not limited to, gaining more insight into the country's mental health service needs, integrating mental health services into the general healthcare system, responding to workforce limitations and increasing financial support¹⁴. Improvement of mental healthcare coverage will need to address both supply-side barriers (e.g., inadequate human and financial resources for mental health, inequities in the distribution of mental health resources) and demand-side barriers (e.g., poor knowledge of mental disorders, low perceived need, the stigma associated with seeking care from a psychiatric service) related to stigma and varying explanatory models of mental disorders¹⁸.

To address these challenges, the very first step is to accurately estimate China's psychiatric burden, unmet mental health service needs, correlates of mental disorders, and help-seeking behaviors of people with mental disorders. Currently, only a small part of mental health patients in China seek and receive treatment. As discussed above, mental health stigma could be a barrier at the demand-side¹⁹. This implies that reducing stigma at the population level (e.g., by education and information) could improve this situation. Researchers and policy-makers have long sought ways to destigmatize mental illness. However, the number of investigations of mental-health stigma and MHL, and their interrelatedness, has been limited in China, making it hard to judge if and how such programs should be targeted. When it comes to the supply-side barrier of present treatment capacity in China, there are no easy fixes, but the increased use of technological tools, such as smartphones and eHealth, could help to further the reach of mental healthcare beyond the available healthcare providers and/or clinics. Given their relevance for mental healthcare in China, both mental health stigma and the use of eHealth are particular points of focus in this dissertation.

THE TIANJIN MENTAL HEALTH SURVEY

Tianjin is a coastal metropolis in northern China and one of the nine national central cities of China, with a total population of 15.6 million as of 2017²⁰. Tianjin is one of the most important engines of China's economic growth: from 1995 to 2010 the population increased by 40% (from 9.4 to 13.0 million), the proportion of the population that were immigrants from other regions of China increased 4.5-fold (from 5.3% to 23.8%), and the per capita Gross Domestic Product (GDP) increased 7.5-fold (from ¥9,769 to ¥72,994)²¹. For the mental health service, a study showed that in 2006, there were about 60 hospitals providing mental health services with 561 psychiatrists, 885 psychiatric nurses and 4281 psychiatric beds in total. Numbers of psychiatrists, nurses and beds per 100,000 people were 5.38, 8.48 and 4.11, respectively²², which was much higher than the national numbers in China in 2008¹⁸ (i.e. 1.7, 3.1 and 1.68, respectively). However, the same study also showed that mental health services were unevenly distributed across different municipal districts in Tianjin and that some communities have no mental health services whatsoever. In fact, the resources of mental health services are relatively concentrated in central districts and quasi-central districts, psychiatric hospitals and tertiary hospitals. In

addition, the vast majority of mental health service staff were engaged in inpatient service and had little professional training²³. Although there have been intentions to improve mental healthcare, the unmet need for psychiatric services in Tianjin could not be addressed unless thorough epidemiological data from were available on the prevalence of mental disorders and current mental healthcare use. Therefore, the Tianjin Mental Health Survey (TJMHS) was set up to provide fundamental data to formulate policies that could help ameliorate the situation. In addition, the TJMHS could provide valuable new scientific insights into mental health in the specific context of rapid economic and demographic changes, which is something that many other urban regions in China are also confronted with. As such, the TJMHS was also intended as a model for conducting ongoing studies of mental health conditions in rapidly changing urban communities in China and other low- and middle-income countries.

The current dissertation aims to present the most important findings from the TJMHS. First, the rationale and methods will be covered in detail. Next, several research questions will be investigated: (1) what is the prevalence of DSM - IV mental disorders and their sociodemographic correlates in adults aged 18 years of age and older? (2) What attitude does public hold toward individuals with mental disorders? (3) What kinds of help and resources are currently sought by individuals with mental disorders? Previous surveys and the issue of mental health stigma are introduced in the following paragraphs.

PREVIOUS MENTAL HEALTH SURVEYS IN CHINA

The earliest reported psychiatric epidemiological surveys in China can be tracked back to 1960s. However, only 6 out of 61 epidemiological studies conducted between 1958 and 1981 were published with the purpose to estimate the prevalence of 'severe mental disorders' (SMI) with clear social impact, such as functional psychoses, organic mental disorders, obsessive-compulsive disorder and hysteria²⁴. In these surveys on SMI, a two-phase method was used. Firstly, they asked local health personnel and neighborhood cadres to provide the information of individuals with any mental problem. Secondly, psychiatrists visited these 'screened' individuals and interviewed them by using the early Chinese classification system of mental disorders. Using these methods, the lifetime prevalence of overall mental disorders was estimated between 1.57% and 1.69%^{24,25}.

From 1981 to 2000, there were two national surveys, in 1982 and 1993, which used stratified random sampling and collected data from key informants of the selected families. Twelve regions were involved in the first one (n=38,136), and seven of the 12 regions were re-examined in the second survey (n=19,233) using the same methodology. Psychiatrists interviewed respondents using the Chinese Manual for Psychiatric Epidemiological Survey (CMPES) that included the ninth edition of the Present State Examination (PSE-9)²⁶ and then made diagnoses using a psychiatric interview schedule based on the Chinese Classification of Mental Disorders and the Chapter V of the International Classification of Diseases, 9th Revision (ICD-9)^{27,28}. The results showed that the point - and lifetime prevalence of mental illness were 0.91% and 1.13%, respectively, in 1982 and 1.12% and 1.35%, respectively, in 1993.

Internationally standardized interview instruments were adopted in Chinese psychiatric epidemiological surveys from 2000 to 2010. In the 2001-2002 period, with the help of the World Mental Health (WMH) Survey Consortium, a survey was conducted in Shanghai and Beijing using trained lay interviewers to interview respondents with the WMH version of the Composite International Diagnostic Interview (WMH-CIDI 3.0)²⁹, which is a fully structured instrument to generate both diagnoses in Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) and ICD-10. In the WMH survey, the 12-month and lifetime prevalence of any disorder were found to be 7.0% and 13.2%, respectively^{30,31}. From 2001 to 2005 another large two-phase psychiatric epidemiological survey was performed in four Chinese provinces (Shandong, Zhejiang, and Qinghai provinces, Tianshui and Qingdao cities)³². In the first phase, an expanded version of the General Health Questionnaire (GHQ) was used for screening, and in the second phase, psychiatrists administered a modified version of the Structured Clinical Interview for DSM-IV (SCID³³). In this survey, the lifetime prevalence of any DSM-IV axis-1 disorder was estimated at 20.0% and the 1-month prevalence was estimated at 17.5%.

Although the surveys conducted so far in China differ with regard to their methods and used diagnostic classification systems, there seems to be a clear trend of increasing mental health problems over time. This could partly be explained by changes in methodology, but could also reflect the influences of the social and economic changes over the past decades. Indeed, correlates of mental disorders include not only individual characteristics or attributes, but also the socioeconomic circumstances in which persons find themselves and the broader environment in

which they live. Table 1 provides an illustrative set of factors that may threaten or protect mental health. In China, urbanization and migration have been associated with many sociodemographic developments that have previously been shown to be associated with increased rates of mental illness^{11,13,30,34–37}. However, continued monitoring of mental health prevalence and its determinants is needed to gain clearer insight into the mechanisms that explain the prevalence increase.

Table 1. Determinants for mental health (adapted from WHO Discussion Paper³⁸)

Level	Adverse factors	Protective factors
Individual attributes	Low self-esteem	↔ Self-esteem ,confidence
	Cognitive/emotional immaturity	↔ Ability to solve problems and manage stress or adversity
	Difficulties in communicating	↔ Communication skills
	Medical illness ,substance use	↔ Physical health ,fitness
Social circumstance	Loneliness ,bereavement	↔ Social support of family & friends
	Neglect ,family conflict	↔ Good parenting /familyinteraction
	Exposure to violence /abuse	↔ Physical security and safety
	Low income and poverty	↔ Economic security
	Difficulties or failure at school	↔ Scholastic achievement
	Work stress ,unemployment	↔ Satisfaction and success at work
Environmental factors	Poor access to basic'services	↔ Equality of access to basic services
	Injustice and discrimination	↔ Social
	Social and gender inequality	↔ justice ,tolerance ,integration
	Exposure to war or disaster	↔ Social and gender equality Physical security and safety

MENTAL ILLNESS STIGMA

Goffman first posited a definition of the stigma of mental illness as ‘*an attribute that is deeply discrediting*’. The recognition of this attribute leads the stigmatized person to be ‘*reduced... from a whole and usual person to a tainted or discounted one*’ p.3³⁹. In this definition, stigma is the relationship between attribute and stereotype. Goffman identified three main groups of attributes: abominations of the body, blemishes of individual character and tribal stigmas. Jones and colleagues proposed a definition around ‘marked relationships’⁴⁰. In this definition, stigma occurs when the ‘mark’ coined for any difference that might possibly give rise to the stigmatizing process connects the labeled person by attributional processes to abominable characteristics, which discredit an individual. Elliott and colleagues pose that stigma is a form of deviance that leads others to judge individuals as illegitimate for participation in an interaction, because they are deemed incompetent, unpredictable, inconsistent, or a threat. Stigma can lead mental health patients to lose legitimacy in the eyes of others

and the resulting illegitimacy can place patients outside the protection of the implicit social norms that govern any interaction⁴¹. Link and Phelan define stigma as ‘the co-occurrence of its components: labeling, stereotyping, separation, status loss, and discrimination in a context in which power is exercised’⁴². As shown above, mental health stigma has been defined and characterized in (slightly) different ways. In addition, it is possible to classify or categorize kinds of mental health stigma. Phelan and colleagues developed a typology of three functions of stigma and prejudice, including exploitation and domination (keeping people down), norm enforcement (keeping people in) and disease avoidance (keeping people away)⁴³. Corrigan categorized stigma as either public stigma or self-stigma. Each of these comprises of stereotyping, prejudice and discrimination⁴⁴. Public stigma is the reaction that the general population has to people with mental illness. Self-stigma is the prejudice that people with mental illness hold against themselves. The revised stigma definition by Thornicroft et al, identifies several aspects of mental health stigma: problems of knowledge (ignorance or misinformation), problems of attitudes (prejudice), and problems of behavior (discrimination)⁴⁵.

Mental illness stigma can seriously impact the opinions and/or behaviors of the public. Behaviors that can originate from public stigma are: withholding help, avoidance, coercive treatment, and segregation of patients in institutions⁴⁴. This can lead to withholding help from patients and isolation of patients due to social avoidance when stigma causes the public to strive to not interact with individuals with mental disorders. It is known that the public holds discriminatory opinions about mental patients and how they should be treated. For example, though recent studies have been unable to demonstrate the effectiveness of mandatory treatment, more than 40% of participants in a study agreed that people with schizophrenia should be forced into treatment⁴⁶. Additionally, the public has been found to endorse segregation in institutions as the best service for people with mental illness⁴⁴, whereas this is known to be completely ineffective and inappropriate. Self-stigma can have a notable impact on patients themselves. For instance, it may impact on self-respect and induce behavioral futility (the “why try” effect⁴⁷). In addition, stigma may undermine care seeking and service participation in two ways. On the personal level, health decision could be effected by stigma related attitudes and behaviors. On the provider and system-level, stigma may lead to a lack of financial investment, inappropriate treatment, and staff incompetence⁴⁸.

In China, people with serious mental illnesses are much more heavily stigmatized than is currently the case in Western countries⁴⁹. Their occasional disruption of social order and their failure to act in ways that promote social harmony are considered serious transgressions of social norms in the Chinese worldview. Several traditional widespread beliefs about mental health patients magnify stigmatization in China⁴⁹. These beliefs include that the mentally ill are frequently violent or destructive, that mental illnesses are the outcome of immoral behavior by the individual, family or ancestors, that mental illnesses are indications of bad 'fate', and that this bad fate may influence people who are associated with the mentally ill, and that mental illnesses are contagious. In China, social interactions are strongly guided by one's social status or 'face': the others' perceptions of one's power and influence as a guarantee of 'credit worthiness' to obtain favors from social acquaintances that are then reciprocated at a later date. Mentally ill persons are both in need of obtaining more social favors and less able to reciprocate such favors, so other people are unwilling to interact with them⁵⁰.

Interestingly, the way mental problems are perceived does differ between urban and rural populations in China. Urban residents most commonly attribute behavioral and emotional abnormalities to social stress (e.g., studies, failure in love), physiological imbalances and psychological problems. Rural residents most commonly attribute behavioral and emotional abnormalities to supernatural causes (e.g., spirit possession), the wrath of ancestors, physiological disturbances that adversely affect the *yin-yang* balance (e.g., an excess or deficiency of eating, sleep, or sexual activity)⁴⁹.

With the increased understanding of the causes of mental problems, beliefs about the contagiousness and moral deficiency of those with serious mental disorders may change, but fears about their potential for violence and concerns about their inability to reciprocate in the social exchange network are likely to be harder to change. It has been proposed that mental health stigma in China might be addressed by increasing mental health literacy (MHL), using national education programs⁵¹. However, the number of investigations of mental-health stigma and MHL, and their interrelatedness, has been limited, making it hard to judge if and how educational programs should be targeted. Some studies in China have shown that public stigma is indeed perceived by patients⁵² and their families⁵³. In addition, several surveys have shown high public stigma^{54,55} and low MHL about depression^{56,57} and

schizophrenia⁵⁸. However, an important research question concerns the actual relationship between MHL and public stigma. In addition, different aspects and/or types of stigma (devaluation vs. discrimination) and their relationships to MHL need to be further investigated. Finally, the role of sociodemographic characteristics (e.g., gender, age, education) and mental health status need to be considered when investigating stigma and its relationship to MHL.

HELP-SEEKING BEHAVIORS FOR MENTAL PROBLEMS IN CHINA

Help-seeking in response to mental illness refers to the behavior of actively seeking help from other people and is about communicating with other people to obtain help in terms of understanding, advice, information, treatment, and general support in response to a problem or distressing experience⁵⁹.

Studies have shown that a majority of persons with mental disorders do not get help⁶⁰⁻⁶². The WHO world mental health (WMH) surveys assessed mental health service use, including mental health specialty, general medical, human services and complementary and alternative medicine, for anxiety, mood and substance disorders in 17 countries⁶⁰. The results showed that the 12-month rate of any service use of low-income countries was 1.6%; that of low-middle income countries ranged from 3.4% to 15.4%; that of high-middle income countries ranged from 4.4% to 5.1%, and that of high income countries ranged from 5.6% to 17.9%. Here, the percentages of specialty mental healthcare use ranged from 0.1% in Nigeria to 8.8% in the USA. The 12-month service use rate in China was 3.4%, with percentages of specialty mental healthcare use, general medical healthcare use, human services and complementary and alternative medicine use of 0.6%, 2.3%, 0.3% and 0.3%, respectively. Another larger survey in China showed low rates of help seeking behavior in people with mental disorders³², indicating that only 8% had ever sought professional help. Among cases eventually making contact with professional care providers, the median delays ranged from 3.0 to 30.0 years for anxiety disorders, from 1.0 to 14.0 years for mood disorders, and from 6.0 to 18.0 years for substance use disorders⁶³.

Several factors have been found to be related to mental health service use. The results from WHO WMH surveys showed that low perceived need and attitudinal barriers were major barriers to seeking and staying in treatment among individuals with common mental disorders worldwide⁶⁴. The WMH survey has shown a lower trend of help-seeking behavior in China than in developed countries and some

developing countries⁶¹. Some socio-demographic factors, such as gender, age, ethnicity, education and income were found to relate to help-seeking behavior. For example, male and young people were not likely to seek help comparing to female and elder individuals⁶⁵. People with higher education and income were more likely to get help⁶⁶. Help-seeking behavior was also associated with diagnosis of mental disorder and the severity of that mental disorder. It was reported that about 72% of individuals with psychotic disorders sought help which was much higher than seen in mood disorders (8.3%), anxiety disorders (6.1%) and substance-use disorders (1.2%)³². Also in the WMH surveys, people with more severe mental problems were more likely to seek treatment⁶¹. In addition, stigma is another important factor attached to seeking help for mental illness^{48,67}, but these findings were not specific for China.

Several previous studies have looked at help-seeking behavior in Chinese people with mental disorders. These surveys showed that besides specialty mental healthcare, some traditional, complementary and alternative medicine were also used as main ways to seek help for mental disorders^{68,69}. The latter include traditional Chinese medicine, acupuncture and moxibustion, massage, Qigong, Tai chi, and Folk therapy, which is generally practiced by witch doctors, shamans, and religious personnel⁶⁹. A survey in the northwest of China showed that among individuals with mental disorders, 75% sought help from non-mental health specialty services such as a general physician⁷⁰. A study investigating the pathways to psychiatric care in urban north China indicated that the majority of patients seek other pathways than to go to mental health professionals directly. Most patients first visited local tertiary general hospitals or local secondary general hospitals. However, a very low percentage (9.6%) of patients were diagnosed with mental disorder if they first visited non-psychiatric hospitals, which is very low compared to patients, who first contacted with a psychiatry hospital, where 55.6% received a professional diagnosis of and treatment for mental disorders⁷¹. A study into mental health help-seeking in Chinese rural residents indicated the relatively higher intention for help-seeking and significantly lower knowledge of helpful resources⁷². In this study, nearly 80% of respondents had the intention to seek mental healthcare if needed, and 72.4% preferred to go to medical organizations, yet only 12% knew of any hospitals or clinics providing such help. Another study⁷³ showed that people with depressive symptoms preferred turning to friends and family (46.5%) rather than to a psychiatrist

(24.9%), psychologist (22.8%) or general practitioner (GP; 19.9%). In this study, 24.3% of a screened-positive cohort reported receiving services from a mental healthcare professional. At this point, it is unclear how the exact mechanisms underlying help-seeking behavior in China work. In order to launch effective programs to improve the reach and effectiveness of mental healthcare in China, these mechanisms should be further investigated.

MOBILE HEALTH TECHNOLOGY TO PROVIDE MENTAL HEALTH CARE

One strategy that could play an important role in future programs to improve the reach of mental healthcare in China, would be the use of mobile mental health apps, as this could make mental support more accessible and could take away some of the current barriers to healthcare seeking⁷⁴. Smartphones have been integrated into the personal, social, and occupational routines of a substantial proportion of the global population. The estimate of number of smartphone users worldwide will climb from 1.57 billion in 2004 to 2.87 billion in 2020⁷⁵. Mobile health (m-health) for mental health has many advantages⁷⁶. First, m-health has a potential capacity to provide everyone with at least basic care. Second, m-health can provide healthcare in apps whenever and wherever users want. Third, for individuals with symptoms, mobile apps could offer immediate support by providing tools and exercises that help manage symptoms. Fourth, m-health apps can provide anonymous and non-stigmatizing support to people seeking mental health advice or treatment. Fifth, m-Health can be tailored to the individual, addressing personal needs. Sixth, m-Health can be linked to wearables, other apps, or features. In addition, m-health interventions may cost less than traditional interventions.

Previous studies have shown that smartphone mental healthcare apps can play an important role in the assessment, prediction and monitoring of mental health. Gire et al. reviewed apps for the assessment of psychotic disorders and found that the apps were used to assess the symptoms, medication adherence, cognitive impairment, social functioning and suicidal ideation in veterans with schizophrenia⁷⁷. Through apps, clinicians can collect self-reported data, performance data, sensor data or social media data of clients, which can help clinicians to make treatment decisions⁷⁸. Some apps for monitoring and management of mental health symptoms or disorders were also found to reduce mental health symptoms or disorders in

evidence-based research^{79,80}. In addition, previous work showed that objectively monitored data through apps showed reasonable accuracy in predicting mood status and mood fluctuations⁸¹. M-health intervention programs have been developed to facilitate recovery and prevention of different categories of mental disorders⁸². For instance, m-health interventions have been found to significantly reduce depression^{83,84}. For obsessive and compulsive disorder (OCD), app-guided exposure and response prevention⁸⁵ and an app involving cognitive exercises for challenging OCD related beliefs⁸⁶ have been shown to significantly reduce OC symptoms. An app based on cognitive behavioral principles designed to support recovery from drug addiction was found to prevent relapse^{87,88}. Finally, a theory-driven digital health intervention for early psychosis was found to help reduce negative symptoms and general psychotic symptoms⁸⁹.

Although mobile apps have been shown to have ability to deliver mental health care, further development is needed. A review provided 16 evidence-based recommendations for future developments of mental health smartphones apps⁹⁰. At this point in time, large numbers of mental health-related apps are available in various app stores, but the content of available apps for mental health is often not in line with clinical guidelines⁹¹ and the most apps have not been investigated in experimental trials to establish their efficacy⁹². There currently is no standardized manner to assess the quality of such apps. Also, despite the many available apps in China, there is a lack of research as the evidence-based studies on mental health apps that have been conducted; the vast majority was conducted in developed countries⁷⁷. In order to gain insight in the potential of m-health in China, the first step is to systematically review all available apps.

OUTLINE OF THIS THESIS

Chapter 2: The Tianjin Mental Health Survey (TJMHS): study rationale, design and methods.

Aim: to provide a detailed overview of the sampling methods, instruments, and survey procedures used in the TJMHS.

Chapter 3: The prevalence, age-of-onset and the correlates of DSM-IV psychiatric disorders in the TJMHS.

Aim: to present (1) estimates of the lifetime and 1-month prevalence rates, persistence and age of onset (AOO) of a wide range of DSM-IV disorders in the TJMHS, and (2) information about the associations between mental disorders and a range of important socio-economic and demographic correlates.

Chapter 4: Mental health stigma and mental health literacy in the Chinese population: results from the TJMHS.

Aim: to investigate: (1) the rates of stigma and MHL, (2) the associations of stigma and MHL with sociodemographic characteristics, (3) the association between MHL and stigma, and (4) the role of sociodemographic characteristics and mental health status in the association between MHL and stigma.

Chapter 5: Help-seeking behaviors among Chinese people with mental disorders: results from the TJMHS.

Aim: to investigate: (1) the total help-seeking and first-time help-seeking rates across different types of help/healthcare among individuals with mental health disorders living in community, (2) the clinical (e.g., severity, diagnosis) and demographic factors related to help-seeking and different types of help/healthcare, and (3) the associations of help-seeking behavior with perceived stigma and MHL.

Chapter 6: The Use and Characteristics of Mobile Mental Health Apps in China: A systematic review

Aims: (1) to characterize the purpose and content of the most downloaded mental health smartphone apps available for use by the general Chinese public, (2) to evaluate whether the content in the offered apps is evidence-based and (3) to gain insight into the applications' costs and the quality and comprehensiveness of reporting on data safety in the apps.

Chapter 7: General discussion: I summarize and discuss the main findings. Furthermore, we discuss the methodology and suggest directions for future research.

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