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

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CHAPTER 7

General discussion

Following the research questions outlined at the beginning of this thesis, in this final chapter, the main findings will first be summarized and discussed. Second, methodological considerations will be discussed. Last, clinical implications and opportunities for future research will be pointed out.

SUMMARY OF MAIN FINDINGS

In Chapter 2, we described how we managed to conduct a mental health survey in a setting with limited psychiatric manpower and resources. In the TJMHS, we used a two-phase design to obtain a representative sample, while making optimal use of available resources. Participants were initially selected from 15,538 households. Of these, 11,748 (75.6%) individuals participated in the Phase 1 screening interview, which was very close to the a priori calculated necessary minimum sample size of 11,909. Of the screened individuals, 4,438 participants who were either at low, medium or high risk of psychopathology, finally completed the SCID. The overall response rate in TJMHS was comparable to the rates in World Health Organization World Mental Health Surveys[1]. Importantly, comparison to census data showed that the weighted TJMHS data adequately represented the Tianjin population of 18 years and older.

In chapter 3, the first main results of the TJMHS were presented in the form of estimated prevalence, age of onset and correlates of a range of mental disorders in Tianjin. Results showed that the lifetime and 1-month prevalence of any mental disorder were 23.6% and 12.8%, respectively. Mood disorders, anxiety disorders and substance-use disorders were the most common mental disorders in Tianjin. In addition, substance-use disorders and psychotic disorders had earlier age-of-onset than anxiety disorders and mood disorders. Being female was related to higher prevalence of any mental disorder. Being divorced/widowed, having a Tianjin Hukou, being a housewife and having a higher education level were associated with lower prevalence of any mental disorder and of mood disorders.

Chapter 4 described a study into perceived mental health stigma and MHL, the correlates of this stigma and MHL, and the association between MHL and stigma in the Tianjin population. The results showed that the general population in Tianjin perceived much higher levels of discrimination than devaluation of patients with mental disorders. Most people were not familiar with knowledge of causes, treatments and prevention of mental illness. People living in rural area, at younger

age, having lower education level, having a lower per capita family income, and being unemployed or being a farming were related to higher levels of mental health patient devaluation and lower MHL score. Higher MHL was found to be associated with both lower perceived mental health discrimination and devaluation.

Chapter 5 described the investigation of help-seeking behavior in both healthcare and non-healthcare settings by those with a mental disorder. In addition, the socioeconomic correlates of help-seeking behavior were investigated. This study showed that only 15.7% of mental health cases reported lifetime help-seeking. Help was most commonly sought in non-healthcare settings, such as friends or relatives. Female gender, younger age, 6-7 years of education, low income, having a psychotic disorder and having ≥2 disorders were associated with increased odds of help-seeking. Seeking help in healthcare rather than non-healthcare settings was associated with older age, being married and having a psychotic or organic disorder.

Chapter 6 described a review that was aimed to gain more insight into the availability and quality of m-health applications that could help to improve mental healthcare capacity and coverage across China by use of intelligent technology. A systematic review was conducted to search, screen and evaluate the most downloaded apps from iOS and Android platforms in China. This review identified 172 unique apps, which were categorized into five groups: psychological counseling apps (n=37, 35.2%), assessment apps (n=50, 47.6%), stress relieving apps (n=12, 11.4%), psychoeducation apps (n=24, 22.9%), and multipurpose apps (e.g., combination of counseling and assessment; n=49, 46.7%). Evaluation of each app revealed that many apps merely functioned as a means to establish contact between patients and care providers, rather than actually taking over tasks from or replacing care providers. In addition, the review showed that most apps target the general population and that there is a lack of apps that actually target psychiatric patients. Luckily, evaluations of the apps also showed that provided information and/or used techniques (e.g., relaxation exercises, elements of CBT) were often supported by at least some evidence.

Together, the described results provide an overall view of the mental health situation in Tianjin. The observed rates of mental healthcare use, perceived stigma and MHL provide clear cues for future development of the mental health prevention and/or treatment strategies in the area. One of the possible strategies would be the

increased use of m-health, for which several recommendations could be formulated based on the presented review. Below, the results will be reflected on more closely.

REFLECTION OF THE FINDINGS

One of the most striking findings in this dissertation (Chapter 4) was that only a small percentage of persons with a mental disorder did seek any help, even in non-mental healthcare settings, which could be a strong signal that there is a sizable unmet need for mental health care in Tianjin. To increase the number of patients that seek help, their knowledge about available help and the ways to find it need to be increased and potential stigma needs to be decreased by e.g., psychoeducation programs. However, this would mean that in parallel, the availability of mental healthcare facilities should be increased, which will be a challenge, judging by the numbers found in the TJMHS. According to the Sixth National Population Census in 2010 of China, there were about 11 million adults in Tianjin. Based on our lifetime mental disorder prevalence estimate of 23.6%, almost 2.6 million people in Tianjin would be expected to have a mental disorder somewhere during their lifetime, which, if all of these patients were to receive proper care, would be a big challenge to the current mental health system in Tianjin. A previous study showed that in 2006, numbers of psychiatrists, nurses and beds per 100,000 people in Tianjin were 5.38, 8.48 and 4.11, respectively[2], which although much higher than the national number in China in 2008[3] (the number were 1.7, 3.1 and 1.68, respectively), is relatively few given the number of people with mental disorders. In addition, it has been shown that there is an imbalanced distribution of mental health resources between urban and rural regions, which also limited the coverage of mental health care in many areas[2]. Based on this previous work and the current findings, it is fair to conclude that the available mental health services in Tianjin will have to be scaled up, so in the long run proper care can be delivered to as many patients as possible.

To develop strategies for the improvement of mental healthcare in Tianjin, it is interesting to investigate the help-seeking pattern of people with mental disorders in Chapter 5. Evaluation of such patterns could provide researchers and policy makers with important insights into how people with mental disorders currently obtain mental healthcare and how this could be streamlined better[4]. In line with other studies[5,6], the majority of patients in TJMHS first sought help from non-healthcare sources, such as relatives and colleagues/friends/neighbors. This indicates that non-healthcare

sources can play an important role to help persons with mental disorders, for instance by recommending patients with a mental disorder to eventually seek professional help[7] or seek traditional, complementary and/or alternative medicine-based help[8]. In addition, of the patients who sought any healthcare services, a sizable proportion only sought non-mental healthcare services, of which general hospitals and TCM hospitals were found to be the most common providers. Such results indicate that many individuals with mental disorders might not recognize their mental health problems as such and, consequently, seek help in a more general setting that may not be optimal for them and could signal a relative lack of knowledge about possible help/treatments for mental problems. This observation aligns with a previous survey in a Chinese rural area[6], which found that a huge gap exists between a high intention to seek help for mental problems and low levels of knowledge about where to get this help. In this thesis, for most people, unfamiliarity with the causes, treatments and prevention of mental illness (Chapter 4) could partly explain the low help-seeking rates and comparatively high non-mental healthcare help-seeking rate and improvement of this knowledge would be likely to improve help-seeking and to decrease unmet need for care.

To improve the overall mental healthcare situation in Tianjin, two aspects need to be considered. On the one hand, one should focus on prevention of new onset of mental health problems. On the other hand, treatment of new and existing mental disorder cases should be improved.

Effective prevention can help to reduce the risk of mental disorders[9]. This thesis provides some important information about possible targets for the prevention of mental disorders. First, in line with previous surveys[10–12], mood disorders, anxiety disorders and alcohol-use disorders were the most common mental disorders in Tianjin, indicating that prevention programs could be developed to specifically focus on these common mental disorder groups (Chapter 3). For example, reducing alcohol consumption by increasing taxes and other control strategies can help prevent alcohol-use disorders and the overall population burden due to alcohol abuse[13]. Also, previous studies have shown promising effectiveness of prevention programs for anxiety and mood disorders[9,13–15]. Chapter 3 also provided information about the target (sub)populations that could be targeted in particular with prevention programs. The study suggests that being female, being divorced or widowed, being a farmer, and having a poor perceived economic status could be suitable indicators to identify

a target group for mood disorders prevention. For substance-use disorder prevention, efforts should be focused more on males, persons living alone and persons with a higher income. For psychotic disorders, attention might be paid to people that were divorced/widowed, to farmers and people with a low income. Chapter 3 also provides cues as to the proper timing of prevention measures. In line with other studies[16,17], mental disorders were found to occur at a young age, but the age-of-onset varied across different mental disorders. Specific phobia, bipolar disorders, substance-use disorders, and psychotic disorders were found to mostly start during adolescence whereas depressive disorder and other anxiety disorders were found to start mostly after the age of 25 years. Overall, this indicates that prevention should be targeted at the adolescent/young adult population.

Any effort to address the improvement of mental healthcare capacity and coverage will need to address both demand-side barriers and supply-side barriers. One pragmatic way to increase mental healthcare capacity could be to involve non-mental healthcare resources in the mental health service system (Chapter 4 and 5). An example of this was investigated in a study in China on recruiting family members as lay health supporters. Aided by a mobile phone messaging system, these supporters helped patients with schizophrenia with supervising medication, monitoring relapse and side effects, and facilitating access to care. The authors found that such supporters improved medication adherence and helped reduce relapses and re-hospitalizations[18,19]. In addition, in line with previous studies, general hospitals and TCM hospitals were found in the present survey to play a significant role in providing care to patients with mental problems [7,20–22]. However, only a very small percentage of patients with a mental disorder was found to visit a community health center, although integrating mental health services into the primary care sphere was proposed to be the priority for mental healthcare system reforms [23]. Therefore, it seems that in order to develop accessible and cost effective mental health service system, main challenges for policy makers and researchers are to (1) get patients to seek help when needed, (2) to engage more non-mental health providers, and (3) to integrate mental healthcare better in an accessible primary care service system.

Given a lack of available facilities, few trained professionals and unequal distribution of mental health services across regions, the use of mobile health technology could be a promising approach to deliver cost-effective and evidence-

based mental healthcare services to large groups of people in China[24]. In theory, well designed apps could help to further the reach of mental healthcare beyond available healthcare providers and/or clinics. Indeed, studies have shown that smartphone mental healthcare apps can play an important role in several aspects of mental health, including diagnostics, monitoring, psycho-education, prevention, and training of mental health providers[25–29]. In Chapter 6, it was found that there is quite a large market for mobile mental health apps in China. However, the results of the review also indicated that the current apps will not be sufficient to address gaps in the mental healthcare system.

Ideally, population/dwelling individuals that experience some mental problems could use a dedicated app to first get some psychopathological assessments, and next receive some type of interactive psychological counseling that targets the reported symptoms and behaviors. In addition, the app could deliver psychoeducation (i.e. information about the possible causes of the complaints and/or needed treatment if symptoms worsen) and stress relieving methods (Chapter 6). However, currently available apps were primarily developed for commercial aims (e.g., appointment scheduling services) and mostly targeted to a general population user base. In addition, the Efficacy of the apps has not or seldom been evaluated. Based on this, we can identify some aspects of mental health apps that need to be addressed before they can be implemented as part of an integrated mental health system. First, apps need to be developed that are capable of interactive assessment of symptoms and delivery of targeted basic treatment. This means that smart and interactive algorithms need to be developed and tested. Second, the developed app should be usable across a broad range of population subgroups, including persons that already have (a history of) mental health problems. Third, studies need to be conducted to determine the most optimal algorithms and user interface, and in a later stage, to test the effectiveness of the app.

This thesis also investigated mental illness stigma, which is one of the factors that may undermine care seeking and service participation both on the personal level and on the provider and system level. Chapter 4 provides some evidence indicating that people are perceived to hold negative attitudes to patients with mental disorders, especially with regard to engaging in closer personal relationships. On a personal level, stigma-related attitudes and behaviors could affect health decisions, because stigma could lead to avoidance of treatment or premature drop out. In addition,

stigma could impede mental health knowledge, for instance by leading persons to believe that treatment of mental health problems is ineffective or irrelevant in the cultural context[30]. Finally, stigma may lead family and friends to distance themselves from a mental disorder patient, taking away a much needed social support network[30]. On the provider level, stigma may lead to a lack of financial investment in mental healthcare, inappropriate treatment, and staff incompetence[30]. In China, the stigma of mental illness does hamper the development of a better mental health workforce because it discourages young people from pursuing a career in mental health[23]. Therefore, reduction of mental health stigma might be an important step in order to enable further development of the mental health service system.

One supposed way to decrease mental health stigma is to increase MHL. However, in the TJMHS we did find no relationship between perceived public sigma and help-seeking (chapter 5). This does not align with previous findings on the role of stigma, but it does align with previous work that found no relation between perceived public stigma and mental health service use[31]. The lack of an association between stigma and help-seeking in the current study might be explained by the fact that only perceived public stigma (i.e. other peoples' perceived stigmatizing ideas/thoughts/actions) and not personal stigma (e.g., respondents' own stigmatizing ideas/thoughts/actions) was assessed. Indeed, there is previous work that found only personal stigma to be associated with help-seeking for mental health[31]. Another explanation is that both stigma and help-seeking behavior are related to and at least partly guided by culture[32–34]. These cultural factors have not been deeply investigated so far, so it remains unclear how exactly mental health stigma and help-seeking behavior are related in China.

Other correlates of help-seeking behavior could provide insights to further help-seeking education for people with mental disorders. Being male, being in the older age-groups, having 7-9 years of education, having an above median income, not having a psychotic disorder, and having 1 disorder were associated with lower odds of help-seeking compared to no help seeking. This is in line with a previous study, which showed that women might be more likely to seek social support in response to stressful experiences than men[35] and a study which found that older generations are less likely to seek help for their mental disorders than younger generations[36]. For the clinical characteristics of mental disorder, not having a psychotic disorder and having 1 disorder were associated with lower odds of help-seeking. This could be explained

by the fact that these characteristics are indicative of considerably lower severity, and that severity is a known strong determinant of help-seeking [3,10,11].

METHODOLOGICAL CONSIDERATIONS

The lifetime prevalence of any disorder in Tianjin (23.6%) was substantially higher than the 1.57% and 1.69%[34,37] that were found before 1980 and the prevalence rates found in the 1982 and 1993 national surveys[38–40], 3.3% and 2.9%, respectively. In addition, the current prevalence rates are higher than the lifetime prevalence rates of 13.2% in Beijing and Shanghai[12] and of 16.6% in a recent national mental health survey between 2013 and 2015[41]. The lifetime prevalence was similar to the lifetime prevalence rate of 21.2% that was found in the Shenzhen survey in 2006[42] and to the lifetime prevalence rate of 20.0% that was found in the four provinces study between 2001 and 2005[10]. The difference of the prevalence among those surveys is partly due to societal and psychological changes. However, we cannot ignore the role of methodological factors in the observed prevalence differences. First, sampling methods could be an important factor. In the surveys before 1980[34,37], the 'clue investigation' approach was used to screen high risk individuals with mental problems. This method might leave out all but the most visibly severe cases that would result in a low estimated prevalence of mental disorder at that time. The use of multistage random sampling in later surveys would partly overcome this methodological issue. Secondly, the used diagnostic instruments and their translation could also play a role. Regarding the two national surveys in 1982 and 1993[38–40], although ICD-9 diagnostic system was followed by the assessment instruments, some nosological features appropriate for local Chinese conditions at the time were added for the diagnosis of depressive psychosis and depressive neurosis. These local adaptations might result in low estimates of milder forms of mental disorders. The CIDI was used in the WMH survey in Beijing and Shanghai[12], the survey in Shenzhen[42] and the latest China mental health survey[41]. Only the four provinces survey also used the SCID an here the estimated lifetime prevalence was quite comparable to the TJMHS. A validity study of CIDI showed a very low diagnostic concordance in anxiety disorders and psychosis compared to the SCID (The kappa values were 0.25 and 0.16, respectively)[43], so the choice of instrument is very likely to have caused some of the observed prevalence differences. In the absence of a true gold standard it is hard to conclude which diagnostic instrument is superior and which prevalence estimates are

the true estimates but it is clear that one should consider the used instrument when interpreting prevalence estimates. Third, the interviewer and their training are another factor than should be considered. Mental health surveys in China used either psychiatrists or lay interviewers as interviewers. Many of the previous surveys used lay/interviewer with limited training and previous experience with mental health. The difference in training and experience between lay interviewers and psychiatrist interviewers is bound to lead to differences in diagnostic outcomes, although the nature of these differences remains somewhat unclear. On the one hand, higher prevalence rates have been found in the current and the four provinces study[10] that used psychiatrist interviewers. On the other hand, prevalence estimates for some specific anxiety disorders in surveys using psychiatrists as interviewers were lower than those in surveys using lay interviewers as interviewers. One explanation for this might be that most Chinese psychiatrists work in mental hospitals that focus on severe mental disorders. As a result, the SCID interviewers might fail to recognize very specific disorders[44]. Still, rigorous SCID training of psychiatrists is recommended so missing of disorders should not occur easily.

METHODS IN THE TJMHS

After a review of previous surveys and the possible methodological issues in mental health survey, we chose a two-phase design as used in the four provinces survey based on several considerations. First, we chose SCID as the diagnostic instrument because it covers all the diagnoses of DSM-IV axis I disorders. Second, the two-phase design could maximize the use of relatively limited psychiatric manpower. Third, multistage sampling methods in combination with weighting of analyses would allow for generalization of the results to the Tianjin population.

Based on previous experience, we also aimed to improve some methodological issues in TJMHS. We deemed it very important to get the cooperation and obtain honest answers from participants. To achieve this, several approaches were adopted to optimize response by gaining the trust of participants. This was done by using local guides, disseminating the information of the survey and using psychiatrist as interviewer to administer the screening and diagnostic process. Local guides play a very important role in establishing contact with each of the selected households. Still, the response rate of TJMHS was a bit lower than that in other four provinces[10] which

used similar methods as TJMHS. This might be caused by the fact that a large portion population in Tianjin lives in urban areas, where compared to rural areas, the social relationship between families and with local heads is relatively weaker. Therefore, the local guides may not have known all the households in each of the sampling sites. Still, it was possible to get generalizable results by weighting the analyses. Additional measures that were taken to ensure good quality data were rigorous training of all staff, a test-retest evaluation, a quality control of SCID interviews, field quality controls and the double-entry of the data. Based on the above, it is fair to conclude that the prevalence rates obtained in the TJMHS are reliable SCID-based prevalence rates that are representative of the Tianjin population. Future surveys could use similar methods but, to increase cost/effectiveness could use a computer-assisted personal interview (CAPI)[45]. Currently, a paper-and-pencil interview (PAPI) was used due to financial considerations and because a Chinese CAPI version had not yet been developed and tested.

CLINICAL IMPLICATION AND DIRECTIONS FOR FUTURE RESEARCH

The findings in this thesis stress the importance of addressing the large gap between high prevalence of mental disorders, low help-seeking and the barriers on both the help provider-side and help demand-side. Our research also suggests new directions for future research.

Results of thesis indicate that most mental disorders have their onset at an early age, especial in adolescents. Therefore, prevention programs that target adolescents might be an effective way to lower the incidence of mental disorders[46,47]. Considering the local situation in Tianjin, schools might be the most proper setting for mental health prevention and promotion programs. Researchers have proposed that mental health education should be included in Chinese school curricula[48]. Promotion and prevention programs also showed their effectiveness in promoting youth mental health and in decreasing their stigma attitudes toward mental disorders[49–51]. Based on the results of this thesis, a mobile-based program named ‘Gatekeeper’ that aims to build an early detection and intervention system for students in middle schools and high schools is being planned in Tianjin. Headmasters and psychological teachers in schools and psychiatrists in the Tianjin mental health center will be involved in

different functions in this program. We will implement this program and evaluate its effectiveness for preventing mental disorders in future research.

In addition, the current findings show that more attention should be paid to common mental disorders such as substance-use disorders, mood disorders and anxiety disorders, which are highly prevalent but have received much less attention than relatively rare disorders like psychosis. Much attention has been paid to psychosis in China especially among those with violent or socially disruptive behaviors [52]. For those with serious mental illnesses, the '686 Programme' in China is launched to integrate mental health services into the primary care system, as well as to integrate hospital and community-based mental health services to manage the patients with severe mental disorders (schizophrenia, schizoaffective disorder, bipolar disorder, delusional disorder, psychotic disorder due to epilepsy, and mental retardation with psychosis) living in communities[23]. In this program, such severe mental disorders are reported by providers in psychiatric hospitals, general hospitals with psychiatric departments, community health centers and village clinics. In this system information about patients' medications, risk of violence and history of crime and violent or disruptive behavior is also collected. The '686 program' model is recommended as a referral for the establishment of mental health service system[23]. However, because this surveillance system was not developed for research purposes, it has been very hard to investigate and has been criticized by researchers for its difficult accessibility, lack of comprehensiveness and poor-quality data[53,54]. Depression and substance-related and addictive disorder have been proposed to also be included in the surveillance scope of this system[54]. Therefore, more studies should be conducted in the future to explore a way to also integrate common mental disorders into the mental healthcare delivery and/or management system and to evaluate the actual functioning of the system. Given the increasing technical possibilities, the latter could be done by using online Routine Outcome Monitoring applications to assess treatment outcome in regular care[55, 56].

CONCLUDING REMARKS

With this thesis on 'Epidemiology and treatment of mental disorders in a rapidly developing urban region in China: a study of prevalence, risk factors and e-applications' I hope to have added important knowledge about the mental health situation in China. Due to the carefully planned design of the TJMHS, I am confident

that the presented results are reliable and represent the actual situation of mental disorders in Tianjin. As such, I hope that they will contribute to a better understanding of mental health in China and to the further development of the mental health service system in China.

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