BRIEF REPORT

Factors of Mental Health Service Utilization by Community-Dwelling Adults in Shanghai, China

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Abstract
This study investigated the utilization of Mental Health Services (MHS) and associated predisposing, enabling, and need factors among residents of Shanghai, China. It used a cross-sectional design and a structured questionnaire. We selected 3502 residents aged 18 years and older through multi-stage, stratified random sampling; trained mental health personnel interviewed them. Multivariate logistic regression analysis explored the predictors of MHS utilization. Among respondents, approximately 21.4% reported depressive symptoms, whereas only 4.7% had utilized MHS. The factors that were significantly related to MHS utilization were the predisposing factors of gender, marital status, occupation, and mental health knowledge; the enabling factors of perceived need for mental health help, regular mental health resources, and government salvage objects; and the need factors of moderate and severe depressive symptoms. Underutilization of MHS in Shanghai is pervasive and worrisome. Interventions in the culture and environment to improve public mental health knowledge are crucial.

Keywords China · Community · Depression · Mental health service utilization

Along with rapid urbanization and economic growth in China, mental health issues have become the leading cause of disability in China. According to the results of an epidemiological survey of mental disorders (Phillips et al. 2009), the adjusted 1-month prevalence of any mental disorder was 17.5% (95% CI 16.6–18.5) from 2001 to 2005 in four provinces of China. Although Chinese people have diverse mental health problems, their mental health service (MHS) utilization has been shown to be extremely low. A previous study (Wang et al. 2007) showed that 91.8% of patients diagnosed with mental disorders never sought help. In the literature, numerous reasons have been given by experts for the gap between the increased prevalence of mental disorders and the underutilization of MHS worldwide, including low awareness of mental health problems, lack of knowledge concerning mental health, lack of access to MHS, stigma and shame associated with mental disorders (Yang 2007), high cost of mental health care, and lack of health insurance. Providing accessible and effective MHS is an urgent societal need, particularly in China. To improve accessibility and effectiveness of MHS, it is crucial to identify factors associated with MHS utilization.

Depression is one of the most prevalent and disabling mental disorders worldwide (Walker and Druss 2015), resulting in lower quality of life, adverse health outcomes, poor prognoses, and deaths from suicide. Due to its fast economic growth and lifestyle diversification, China faces the challenge of an increasing prevalence of depression, especially in a developed international metropolis like Shanghai. Surveys by Chinese health authorities have estimated that approximately 100 million people throughout China are suffering from depression. Moreover, the current health care system focuses on mental health services for those with schizophrenia and organic disorders, and relatively less attention has been given to depression, which represents a major burden (Phillips et al. 2009). Although the mental health field has developed methods for preventing

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and treating depression, fewer than half of depressed patients (in many countries, fewer than 10%) receive such treatment.

The Anderson Behavioral Model of Health Services Use (ABM) (Andersen 1995) is a theoretical framework used to identify factors associated with a specific population's health care utilization. It has been used extensively in studies and is shown to yield reliable results. The ABM suggests that an individual's use of health services is a function of three characteristics: predisposing, enabling, and need factors. Examples of predisposing factors include demographic factors of age and gender as biological imperatives, and social factors such as education, occupation, ethnicity, marital status, religion, and health beliefs. Enabling factors encompass personal and community resources and accessibility of those resources, which are usually affected by an individual's income, health insurance, regular source of care, and so on. In addition, need factors include individuals' perceived needs, as well as professional evaluations of needs. The importance or significance individuals assign to their health, such as in the case of self-reported health status, leads to decisions as to whether to use health care. A professional evaluation applies professional judgment and objective measurement as to the need for health care. Nevertheless, mental health need factors have often been measured through self-report assessments that have been shown to have definitive effects on the use of MHS. The ABM can predict or explain the use of health care services. Each of its components can independently contribute to predicting use. The ABM also suggests "an explanatory process or causal ordering" in which "the predisposing factors might be exogenous, some enabling resources are necessary but not sufficient conditions for use, and some need must be defined for use to actually take place" (Andersen 1995).

In China, for various historical reasons, MHS have been a low priority (Liu et al. 2011). The majority of MHS studies have focused on the provision of MHS for severe mental illness (Wong et al. 2014), with relatively little emphasis on the correlation of characteristics of individuals needing and using MHS. In contrast, the association between individual factors and MHS utilization in western countries has been addressed in many studies. However, such studies have not yet been conducted in China, even in developed cities such as Shanghai. This study was designed to generate survey data by applying ABM to predict factors that may affect MHS use among communities of adults in Shanghai, China.

Methods

Study Population

This study used a cross-sectional survey in three randomly selected districts of Shanghai, China (there are

15 urban districts in total). In 2016, there were approximately 24 million permanent residents in Shanghai. The per capita disposable income was CNY 54,305, a top rank for Chinese cities.

To recruit the study population, a multistage stratified random sampling method was used. In the first stage, three districts of the 15 urban districts in Shanghai were randomly selected as sampling regions. In the second stage, one sub-district was randomly sampled from each district. In the third stage, to guarantee representativeness of each sample, the groups for the study covered all neighborhoods in three chosen sub-districts. In the final stage of sampling, we selected eligible individuals from each neighborhood, using a list of residents aged ≥ 18 years from Shanghai Mental Health Center. Eligibility criteria included: (1) being aged 18 and older, with no upper age limit; (2) having the ability to communicate with the interviewer in Chinese and the willingness to provide informed consent.

A structured questionnaire was designed to estimate individuals' factors and MHS utilization, while a pilot study tested a convenience sample of 30 respondents drawn from the sample population. This study protocol was approved by the Ethics Committee of the Shanghai Mental Health Center in September 2016.

Data Collection

Data were collected through face-to-face interviews between July and November 2016. Before filling out the questionnaire, each person selected was given an elaborate explanation of the study and its purpose. Those who agreed to participate signed the approved informed consent form prior to the interview.

The survey was conducted as a self-completed questionnaire, which each participant in the study filled out independently. Participants who had difficulty completing the questionnaire, for example, an inability to read its contents, were assisted by trained interviewers in reading the questions and recording their answers. The interviewers were mainly community health and mental health professionals from mental health centers in the three selected districts.

Measurements and Definitions

Mental Health Service Utilization

Lifetime MHS utilization was determined by community residents' self-reports of care, and information was collected by asking, "Have you received MHS?" Answers were coded dichotomously as yes and no. Use of MHS was defined as the dependent variable in the analysis.

Predisposing Factors

These factors relate to the propensity of an individual to use healthcare. In this study, seven characteristics were identified as predisposing factors: (1) age was in the range of 18–94 years; (2) gender was coded as male or female; (3) educational attainment was coded as three categories (middle school and below; high school, vocational school, or technical secondary school; and college degree and above); (4) ethnicity was dichotomously coded as Han nationality and national minority; (5) marital status was grouped into single, married, widowed, or divorced; (6) occupation was categorized as administrator or professional (e.g., government agency staff, doctors, lawyers, accountants, and engineers), general staff (e.g., secretaries and employees), and blue-collar workers; and (7) mental health knowledge scores as an indicator of health beliefs were estimated based on a selection of seven of the most important items from the Mental Health Knowledge Questionnaire (MHKQ) issued by the Chinese Ministry of Health (2010). Cronbach's alpha was 0.67.

Enabling Factors

Enabling factors can facilitate or impede MHS use, including annual personal income, insurance coverage, regular sources of mental health care in the community, the government salvage object, and perceived need of help. Annual personal income was coded into three groups: ≤ CNY 30,000, CNY 30,000–60,000, and > CNY 60,000. Insurance coverage was dichotomized according to whether individuals had medical insurance. Similarly, regular sources of mental health care in the community (Minkler 2005) were assessed as existing and not existing by asking "whether or not MHS has been provided in your community?" The government salvage object and perceived need for help were dichotomized into yes and no. The following question was used to measure the perceived need for help: "Do you think communities need MHS?"

Need Factors

Depression, as an important need indicator of mental health care, was measured using the Chinese version of the Patient Health Questionnaire-9 (PHQ-9), with score ranges from 0 to 27 points. As a severity measure, PHQ-9 scores of 5, 10, 15, and 20 represent valid thresholds demarcating the lower limits of mild, moderate, moderately severe, and severe depression, with a higher score meaning more severe depressive symptoms. The Cronbach's alpha was 0.87.

Data Analysis

The data from the questionnaires were double-entered to create a database, and the consistency of both datasets was compared using the EpiData program (version 3.2). Statistical analyses were conducted with R program 2.9.1. Descriptive statistics were used to summarize the characteristics of the sample. Categorical variables were presented as counts and percentages, whereas continuous (numerical) variables were described with the mean and standard deviation, M (SD).

Logistic regression analysis was conducted to analyze the effects of pre-defined factors (as independent variables) on MHS use (as the dependent variable). Multicollinearity was identified to use pair-wise Pearson's correlations among the independent variables before applying logistic regression analysis. Correlation coefficients between the independent variables were expected to be less than 0.6. Consistent with ABM, three multivariate logistic regression models were used to identify factors related to MHS utilization. These models progressively adjusted for predisposing, enabling, and need factors. The predisposing factors were first entered into Model 1, enabling factors then added into Model 2, and need factors entered into Model 3. A factor was considered statistically significant when the two-tailed p value was smaller than 0.05. However, those of non-significant variables were entered into the next model because the criterion of $p = .05$ may not apply to all variables that may become important in the later model.

Results

Characteristics of the Sample

In this study, Changning, Xuhui, and Yangpu districts were randomly selected, and 4000 persons were invited to participate from the list of eligible residents. Four hundred thirty-six (436) respondents withdrew from the study owing to personal reasons, and 62 individuals failed to complete the questionnaire properly. Consequently, 3502 (87.6%) persons completed the questionnaires, as well as the depression measurements.

Predisposing Factors

Among respondents ($n = 3502$) with a mean age of 68.36 years ($SD = 10.88$, range 18–94), there were more women ($n = 2049$, 58.5%) than men ($n = 1453$, 41.5%). Most respondents were married ($n = 2926$, 83.5%), and about half ($n = 1730$, 49.4%) had at least a middle school certificate or below. The vast majority ($n = 3472$, 99.1%) were Han Chinese, and 87.7% ($n = 3072$) had no religion. Most were

blue-collar workers ($n = 1412$, 40.3%), as compared with general staff ($n = 1119$, 32.3%), and administrators and professionals ($n = 934$, 26.7%). In addition, individuals' mental health knowledge scores were 4.19 on average ($SD = 1.64$).

Enabling Factors

In terms of enabling factors, average annual personal income was CNY 44,478 ($SD = 23,275$), and most respondents ($n = 2178$, 62.2%) reported an average annual income between CNY 30,000 and CNY 60,000. Almost all respondents ($n = 3405$, 97.3%) were covered by medical insurance. In addition, more than half ($n = 1838$, 52.5%) reported having a regular source of mental health services, while 67.2% ($n = 2353$) indicated a perceived need for help from MHS. Almost all respondents ($n = 3339$, 95.3%) were not government salvage objects.

Need Factors

Only 21.4% ($n = 747$) respondents (PHQ-9 score ≥ 5) had depressive symptoms and an evaluated need for mental health resources. Among respondents with depression, 605 (17.3%) had mild depression, 99 (2.8%) moderate depression, and 43 (1.2%) severe depression.

Mental Health Services Use

Of the 3502 respondents, a large percentage did not use MHS ($n = 3092$, 88.3%), and only a few used MHS ($n = 96$, 2.7%). Moreover, 314 (9.0%) were unwilling to report their use of MHS. Further, only 30 (4.7%) out of 644 (20.2%) with depressive symptoms reported use of MHS during their lives, whereas more respondents ($n = 66$, 2.6%) of out 2544 (79.8%) without depressive symptoms had used MHS. Despite these dose–response relationships, only 8 (1.2%) moderate and severe cases regularly received MHS during their lives, while 22 (4.1%) mild cases had received MHS.

Predictors of MHS Utilization

Three logistic regression models were conducted to identify predisposing, enabling, and need factors as predictors of MHS utilization (Table 1). In Model 1, three predisposing factors showed significant associations ($p < .05$), including marital status, occupation, and mental health knowledge levels. Married and widowed respondents (odds ratio [OR], 0.25, 95% CI [0.1–0.62] and OR 0.12, 95% CI [0.05–0.54], respectively) were less likely to use MHS than single respondents. However, there was no statistically significant difference in the use of MHS between single and divorced respondents ($p > .05$). Compared to administrators and professionals, general staff had an OR of MHS utilization of

1.79 ($p = .045$). In addition, the probability of MHS utilization increased with increasing mental health knowledge scores (OR 1.18, 95% CI [1.04–1.35]).

When adding the five enabling factors to Model 2, the statistically significant factors increased to seven, while the effect of mental health knowledge as a predisposing factor disappeared, and the effect of gender became significant. In Model 2, gender, marital status, occupation, regular sources of mental health care, perceived need for help, and government salvage object were significantly correlated with lifetime use of MHS ($p < .05$). Among all the significant factors in Model 2, women had a much higher probability of using MHS than men. Respondents who did not have a regular source of mental health care in the community and those who did not need help with psychological problems were less likely to use MHS (OR 0.62, 95% CI [0.38–1.0], $p = .049$ and OR 0.49, 95% CI [0.25–0.94], $p = .032$ respectively). In addition, for those without government salvage objects, the OR for MHS use was 0.37 compared to those with government salvage objects.

When the severity of depression as a need factor was entered into Model 3, moderate and severe depression were positively associated with the use of MHS (OR 3.37, 95% CI [1.50–7.58], $p = .003$), while other statistically significant factors stayed the same. However, the category of mild depressive symptoms did not show statistically significant correlations with the utilization of MHS.

Discussion

The results of this study demonstrate the existence of a high prevalence of depression and low levels of lifetime MHS among adults living in communities in Shanghai. The individuals' variables of predisposing, enabling, and need factors were related to MHS utilization.

In this study, we found that 4.7% of respondents with depressive symptoms used MHS. The study (Wang et al. 2007) of MHS utilization in 17 countries through the WHO world mental health surveys suggests that rates of respondents using MHS in the previous 12 months varied from 1.6% in Nigeria to 17.9% in the US, including 3.6% in Shanghai and 5.6% in Japan. A similar study (Park et al. 2013) revealed an 8.5% lifetime MHS utilization rate in Korean-American immigrants. Compared with data from the literature, our study revealed a comparable level of MHS underutilization in Shanghai, although the city is considered to be modern and developed, with a relatively complete MHS system. Moreover, among the minority of individuals using MHS, even fewer are likely to have effectively used MHS. The identified barriers to effective MHS include a lack of resources and a lack of trained health-care providers (Phillips et al. 2009). For example, people who are depressed are

Table 1 Logistic regression analysis of factors associated with the utilization of MHS

	Model 1			Model 2			Model 3		
	OR	p	95% CI	OR	p	95% CI	OR	p	95% CI
Block 1: Predisposing factors									
Gender (ref.: male)									
Female	1.55	.058	0.99–2.44	1.69	.035*	1.04–2.74	1.67	.040*	1.02–2.71
Age (ref: 18–60)									
61–75	1.48	.234	0.78–2.80	1.84	.098	0.89–3.81	1.84	.101	0.89–3.82
> 75	1.33	.465	0.62–2.89	1.79	.182	0.76–4.19	1.70	.225	0.72–4.01
Marital status (ref.: single)									
Married	0.25	.003*	0.10–0.62	0.26	.008*	0.10–0.71	0.28	.014*	0.10–0.77
Widowed	0.16	.003*	0.05–0.54	0.14	.005*	0.04–0.55	0.15	.007*	0.04–0.60
Divorced	0.41	.222	0.10–1.73	0.46	.312	0.10–2.09	0.46	.328	0.10–2.16
Ethnicity (ref.: Han)									
Minority	1.86	.550	0.24–14.39	2.17	.478	0.23–18.48	2.24	.456	0.27–18.57
Educational attainment (ref.: middle school and below)									
High school	0.86	.579	0.51–1.45	0.94	.813	0.54–1.62	0.91	.749	0.53–1.58
College and above	1.08	.809	0.56–2.08	1.04	.925	0.50–2.14	1.01	.982	0.49–2.09
Occupation (ref.: administrator and professional)									
General staff	1.79	.045*	1.01–3.16	1.89	.035*	1.05–3.41	1.90	.034*	1.05–3.44
Blue-collar workers	0.81	.534	0.42–1.58	0.87	.685	1.04–1.74	0.83	.598	0.41–1.67
MHK	1.18	.013*	1.04–1.35	1.10	.217	0.95–1.27	1.09	.251	0.94–1.26
Block 2: Enabling factors									
Income (ref.: CNY 30,000 and below)									
CNY 30,000–CNY 60,000				0.96	.897	0.53–1.74	1.00	.994	0.55–1.81
CNY 60,000 and above				1.59	.301	0.66–3.80	1.64	.266	0.69–3.92
Insurance (ref: yes)									
1 = yes, 2 = no				2.45	.383	0.33–18.22	2.48	.376	0.33–18.53
Regular mental health source of care (ref: yes)									
1 = yes, 2 = no				0.62	.049*	0.38–1.00	0.60	.040*	0.37–0.98
Perceived need of help (ref: yes)									
1 = yes, 2 = no				0.49	.032*	0.25–0.94	0.46	.021*	0.24–0.89
Government salvage object (ref: yes)									
1 = yes, 2 = no				0.37	.010*	0.17–0.78	0.43	.030*	0.20–0.92
Block 3: Need factors									
No depression (PHQ-9 0–4 scores) (ref.)									
Mild depression (PHQ-9 5–9 scores)							1.63	.086	0.93–2.84
Moderate and severe depression (PHQ-9 10 scores or more)							3.37	.003*	1.50–7.58

MHK mental health knowledge, *OR* odds ratio, *CI* confidence interval

*p < .05

often not correctly diagnosed, and others who do not have the disorder may be misdiagnosed and prescribed antidepressants. Another barrier to effective care is that unique cultural beliefs contribute to the presence of a strong stigma surrounding mental illness among Chinese people.

In addition, the 2.6% rate of MHS utilization for individuals without depressive symptoms in this study is less than the use rate observed in the US (9.7%) or in Japan (4.5%), which demonstrates a generally appropriate dose–response relationship between need indicators and service use (Bobevski et al. 2017). On the other hand, the results of this study could signify that a significant number of services are being used by those without apparent needs. Overall, the findings in our study strongly suggest that efforts to improve MHS utilization need to address both an increase in availability of MHS and support for people to enrich their mental health knowledge, as well as improvements in accessibility of mental health care.

Our findings regarding predisposing factors of MHS utilization are generally consistent with the literature, in that

gender and marital status were significantly related to MHS use. The higher probability of MHS utilization in females, as opposed to males, may be attributed to the idea that women are more prepared than men to translate nonspecific feelings associated with psychiatric symptoms into conscious recognition of a problem (Kessler et al. 1981). The greater use of MHS among singles may indicate a lack of positive personal relations as motivation for seeking MHS. Higher MHS utilization among general staff workers indicated that more working pressure existed in this group than in other occupations we studied. Our findings suggested that efforts to improve MHS utilization should be devoted to general staff, and single and male groups. In this study, mental health knowledge showed a significantly positive association with use of MHS. This finding is consistent with previous studies (Thompson et al. 2004), indicating that increasing mental health knowledge of community residents might be a key strategy to increase MHS use rates.

This study demonstrated that a regular source of mental health care was a critical factor in MHS utilization. In the study population, residents with access to a regular source of mental health care (i.e., family doctor, community clinic, etc) were more likely to use MHS than other residents. The results demonstrated that gatekeepers, who are trained to identify psychiatric symptoms and to make referrals when indicated, are critical figures in increasing MHS utilization in the community (Codony et al. 2009; Forrest 2003). Furthermore, an effective method for integrating MHS into basic public health services is to involve policy makers. The results of this study supported previous findings of a positive association between a perceived need for help and MHS utilization (Mackenzie et al. 2010). The WHO global survey of adults indicated that a low perception of the need for help (58%) was an important reason why individuals did not seek professional treatment. The results revealed that the use of MHS would be effectively improved by increasing recognition of people's perceived need for help. In our study, the results showed that residents with government salvage objects were more likely to use MHS than others. Perhaps many of the residents with severe mental health problems receive government salvage objects and can obtain free follow-up visits provided by community mental health service providers.

In our study, mild depressive symptoms did not have statistically significant associations with use of MHS, but moderate or severe depressive symptoms showed strong positive associations with MHS utilization. This result is different from the finding in the US study that showed a significant relationship between mental disorder severity and the probability of health service use. Furthermore, in studies on general physical diseases, poorer health status was found to be related to a higher rate of health service use (Chappell and Blandford 1987). Possible explanations for

our findings may be found in the negative attitudes that may exist toward mental illness in Chinese culture. Many Chinese people resist using MHS until they can no longer manage psychiatric symptoms. On the other hand, cutoff scores of PHQ-9 may be underestimated.

Contrary to some previous studies (Fellow et al. 2009; Kronenfeld 2005), this study yielded no evidence to support an association between the income of individuals, insurance status, and MHS utilization. In Shanghai, almost all residents have insurance for medical care, which is in line with the data in our study. This is therefore likely to be the reason that no association could be observed between medical insurance and MHS utilization. If the question of whether the cost of MHS is covered by respondents' medical insurance was included in the questionnaire, the impact of insurance on MHS utilization could be more clearly identified (Hochhausen et al. 2011; Kessler et al. 1981; Parslow et al. 2002). Many studies suggest that higher education levels and younger age are related to a significant increase in the likelihood of mental health utilization; this, however, was not reflected in our findings. The reason for this is unclear.

The following limitations of this study should be noted. First, our study was based on a cross-sectional design; therefore, associations observed between variables cannot be inferred as causal relationships. Second, the mean age of respondents in the study was higher than the mean age of Shanghai residents. In Shanghai, the mean age of the population is higher than in most cities in China. Therefore, generalization of the study results cannot be simply applied to either Shanghai or China. Third, in the study, it should be noted that there are differences between MHS utilization in the categories of general mental health problems and depression, specifically. However, the study did not determine how many respondents used MHS for depression. A future study may further explore mental health specialties used according to the severity of specific mental disorders. Fourth, self-reported use of MHS was based on recall, which can be subject to recall bias. Moreover, the literature shows that individuals may under-report MHS utilization due to stigma and sensitivity. Therefore, our study may possibly underestimate MHS use rates.

Conclusions

The study showed a low use rate of MHS among adult residents dwelling in communities in Shanghai. Mental health administrations should pay more attention to the association between the characteristics of individuals. An urgent need for cultural and contextual intervention aimed at improving public awareness and mental health knowledge is emphasized in the study. Strategies for future interventions should focus on providing early screening and prevention efforts

for mental health issues, as well as improving access to MHS. An effort to expand coverage of MHS in communities through health reform is encouraged.

Compliance with Ethical Standards

Conflict of interest All authors declare that they have no conflict of interest.

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