

# A Cross-sectional Survey of Disability Attributed to Mental Disorders and Service Use in China

Li-Li Shang, Yue-Qin Huang, Zhao-Rui Liu, Hong-Guang Chen

Department of Social Psychiatry and Behavioral Medicine, Peking University Sixth Hospital (Institute of Mental Health), National Clinical Research Center for Mental Disorders and Key Laboratory of Mental Health, Ministry of Health (Peking University), Beijing 100191, China

## Abstract

**Background:** Mental disorders are strongly associated with disabilities. National survey on disability could provide a reliable basis for policymaking in care and rehabilitation of disabled persons. This study aimed to describe the disability prevalence rates attributed to mental disorders, their distribution by sociodemographic factors, and utilizations of service.

**Methods:** This study is a secondary data analysis of the Second National Sample Survey on Disability in 2006. The disability and severity were assessed using the World Health Organization Disability Assessment Schedule 2.0. Mental disorders were diagnosed according to the International Statistical Classification of Diseases and Related Health Problems 10<sup>th</sup> Revision Classification of Mental and Behavioral Disorders. Using descriptive and analytic epidemiological methods, prevalence rates of disability attributed to mental disorders and service use were calculated.

**Results:** Data of 2,526,145 respondents were analyzed. The disability prevalence rate attributed to mental disorders in China was 6.3%, accounting for 9.9% of all disabled people. Regarding disability prevalence attributed to mental disorders, it showed that gender, residential area, marital status, education level, and economic area were related to the prevalence distributions. The proportions of mild disability were highest in the disabled people with onset age of 18–64 years, while the proportion of extremely severe disability was highest in the disabled people with onset age of 65 years and above. Only 58.6% of disabled people attributed to mental disorders used some of the services.

**Conclusions:** There are statistical differences of disability prevalence attributed to mental disorders by people and region in China. Service use in disabled people with mental disorders is insufficient.

**Key words:** Disability; Epidemiology; Mental Disorder; Prevalence; Service

## INTRODUCTION

Mental disorders have become a global challenge that is more evident in fast-growing developing countries. Mental disorders are strongly associated with disabilities. The permanent and irreversible characteristics of the disability declined quality of life in disabled persons and aggravated disease burden. Neuropsychiatric disorders are one of the most important causes of disability, accounting for around one-third of years lost due to disability among adults. Mental disorders such as depression, alcohol use disorders, bipolar disorder, and schizophrenia are among the 15 leading causes of disability.<sup>[1]</sup>

The Chinese government conducted the Second China National Sample Survey on Disability in 2006, aiming at getting information of all kinds of disabilities. It was a nationally representative cross-sectional survey, which has been the largest and latest national survey on disability

so far. This survey provided a reliable basis to Chinese government for policymaking in care and rehabilitation of disabled persons. The disability criteria made by this survey are still in use today. Some papers have been published for this survey.<sup>[2-5]</sup> The present study was a secondary analysis of data from the Second China National Sample Survey on Disability and aimed to describe the disability prevalence rates attributed to mental disorders, their distribution by sociodemographic factors, and utilizations of service.

**Address for correspondence:** Prof. Yue-Qin Huang,

Department of Social Psychiatry and Behavioral Medicine, Peking University Sixth Hospital (Institute of Mental Health), National Clinical Research Center for Mental Disorders and Key Laboratory of Mental Health, Ministry of Health (Peking University), Beijing 100191, China  
E-Mail: huangyq@bjmu.edu.cn

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The findings from this study may be broadly reflection of the disability attributed to mental disorders in China, which would be useful for making secondary and tertiary prevention strategies.

## METHODS

### Ethical approval

The study was approved by the Chinese State Council. The informed consent was obtained from the respondents or their guardian. The doctors provided medical and rehabilitation suggestions to those disabled people during the survey.

### Sample

The data of this paper were derived from the Second China National Sample Survey on Disability conducted from April 1 to May 31, 2006. This survey aimed to describe the prevalence and causes of disability, so as to explore the characteristics of people with disabilities in China. Stratified, multiphase, and cluster probability sampling were used in the survey, and a total of 734 counties (cities or districts), 2980 towns (townships or streets), and 5964 communities were selected. Totally, 2,526,145 individuals in 771,797 households were investigated in this survey. The details about protocols and sampling procedures of the survey were described elsewhere.<sup>[2]</sup>

### Measures

#### Disability assessment

The disability and severity were assessed using the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0). People whose score of WHODAS 2.0 were higher than 51 were identified as disability. The disability attributed to mental disorders was classified into four degrees: mild (the WHODAS 2.0 score is between 52 and 95), moderate (the WHODAS 2.0 score is between 96 and 105), severe (the WHODAS 2.0 score is between 106 and 115), and extremely severe (the WHODAS 2.0 score is 116 and over).

For people aged 7 years and older, the trained interviewers using standard screening instruments carried out screening of disability. If any positive screening is found, the trained psychiatrists carried out clinical diagnosis for mentally disabled people afterward. For children aged 7 years and younger, the pediatricians made screening and diagnosis of disability, and mental disorder as well.

#### Criteria of mental disability

Mental disorders were diagnosed according to the International Statistical Classification of Diseases and Related Health Problems 10<sup>th</sup> Revision (ICD-10). Mental disorders included organic mental disorders, mental disorders due to psychoactive substance use, schizophrenia, schizotypal and delusional disorders, mood disorders, neurotic stress-related and somatoform disorders, behavior syndromes, disorders of adult personality and behavior, autism, and epilepsy.

## Variables

Sociodemographic information of the respondents, including gender, age, residential area, marital status, education level, economic area, and ethnic groups were collected. The status of disability attributed to mental disorders was labeled as yes or no; age group as 17 years and younger, 18–34 years, 35–49 years, 50–64 years, and 65 years and older; residential area as rural and urban; marital status as married, unmarried, and divorced/widowed; and education level as illiterate, primary school, middle school, and college and higher. In China, provinces, autonomous regions, and municipalities were divided by geography and economic status into three regions as the Western, Central, and Eastern. The ethnic group was divided into Han and minorities. The top ten ethnic groups were those with the top ten largest population among all ethnic groups. The respondents were asked about service or support that they had ever received in their life, including medical care, rehabilitation, education, employment, living or other aspects of the disabled persons' federation, civil affairs department, and others.

### Data analysis

Qualitative variables were analyzed by cross-table as statistical description. Chi-square test was used to examine the differences of the disability prevalence rates by various sociodemographic characteristics. Chi-square trend test was used to examine the association between onset age of the disability, service use, and different degrees of severity. The Statistical Product and Service Solutions 20.0 (SPSS Inc., Chicago, IL, USA) package was used to perform all data analyses. A value of  $P < 0.05$  was considered statistically significant.

## RESULTS

### Disability prevalence rates attributed to mental disorders and related sociodemographic distribution

In this survey, a total of 2,526,145 people were investigated and 161,479 were identified as any of disability. A total of 15,928 disabled people with mental disorders were diagnosed, accounting for 9.9% of all disabled people. The disability prevalence rate attributed to mental disorders was 6.3‰.

A number of sociodemographic variables were significantly related to disability prevalence rate attributed to mental disorders [Table 1]. The disability rate of females was 1.2 times higher than that of males ( $P < 0.001$ ). The disability rates increased with ages ( $P < 0.001$ ). The highest disability rate was in the age group of 65 years and above (11.3‰), and the lowest disability rate was in the age group of 17 years and younger (1.3‰). The disability rate attributed to mental disorders in rural area was higher than that in urban area ( $P < 0.001$ ). The disability rate attributed to mental disorders in unmarried and divorced/widowed people was higher than that in married people ( $P < 0.001$ ). The

disability rate in low education people was higher than that in high education people ( $P < 0.001$ ). The disability rates attributed to mental disorders were statistically different in three economic areas ( $P < 0.001$ ), whereas there was no significant difference between the eastern and the western area ( $P > 0.05$ ). The Han ethnic people had a significantly higher disability rate of disability attributed to mental disorders than the minorities ( $P < 0.001$ ).

Table 2 shows that disability prevalence rates attributed to mental disorders were significantly different in the top ten ethnic groups in 56 ethnic groups in China ( $P < 0.001$ ).

The highest disability prevalence rate attributed to mental disorders among ethnic groups was in the Yi ethnic group (9.4%), followed by the Zhuang ethnic group (7.7%) and the Han ethnic group (6.4%).

### The onset age of disability attributed to mental disorders by degrees of severity

People with extremely severe impairments accounted for 30.6% of all of the disabled persons attributed to mental disorders, while people with mild impairments accounted for 39.6% [Table 3]. The proportions of mild disability were highest in the disabled people with onset age of 18–64 years,

**Table 1: Disability prevalence rates attributed mental disorder and distributions in China ( $n = 15,928$ )**

Sociodemographic factor	Number of disabled people	Prevalence rate (%)	Prevalence ratio	$\chi^2$	$P$
Gender					
Male	7405	5.8	1.0	112.050	<0.001
Female	8523	6.8	1.2		
Age				4582.591	<0.001
≤17 years	773	1.3	1.0		
18–34 years	3114	5.3	4.1		
35–49 years	5056	7.9	6.1		
50–64 years	4139	9.5	7.3		
≥65 years	2846	11.3	8.7		
Residential area				147.447	<0.001
Rural	11,310	6.7	1.2		
Urban	4618	5.5	1.0		
Marital status				3375.299	<0.001
Married	4361	5.2	1.0		
Unmarried	8801	5.8	1.1		
Divorced or widowed	2766	17.4	3.3		
Education level				3922.479	<0.001
Illiterate	5973	12.3	6.5		
Primary school	4843	6.2	3.2		
Middle school	4866	4.3	2.3		
College and higher	246	1.9	1.0		
Economic area				35.822	<0.001
Eastern	6351	6.5	1.1		
Central	4366	5.8	1.0		
Western	5211	6.5	1.1		
Ethnic group				10.669	<0.001
Han	14,183	6.4	1.1		
Minorities	1745	5.9	1.0		

**Table 2: Disability prevalence rates attributed to mental disorders in the top 10 ethnic groups ( $n = 15,928$ )**

Ethnic group	Number of disabled people	Prevalence rate (%)	Prevalence ratio	$\chi^2$	$P$
Han	14,183	6.4	1.4	74.111	<0.001
Zhuang	237	7.7	1.7		
Manchu	137	5.0	1.1		
Hui	172	5.6	1.3		
Miao	98	4.4	1.0		
Uygur	152	6.0	1.3		
Tujia	164	6.0	1.4		
Yi	176	9.4	2.1		
Mongolian	65	4.9	1.1		
Tibetan	169	5.1	1.2		

**Table 3: Proportion of disability severity in different onset age groups (n = 15,928)**

Disability onset age	Extremely severe, n (%)	Severe, n (%)	Moderate, n (%)	Mild, n (%)	Total, n	$\chi^2$	P
≤17 years	1241 (36.3)	534 (15.6)	530 (15.5)	1117 (32.6)	3422	19.715	<0.001
18–34 years	1600 (26.8)	885 (14.8)	1022 (17.1)	2469 (41.3)	5976		
35–49 years	718 (22.2)	430 (13.3)	531 (16.4)	1555 (48.1)	3234		
50–64 years	490 (27.4)	236 (13.2)	236 (13.2)	827 (46.2)	1789		
≥65 years	827 (54.9)	187 (12.4)	159 (10.6)	334 (22.2)	1507		
Total	4876 (30.6)	2272 (14.3)	2478 (15.6)	6302 (39.6)	15,928		

but the proportion of extremely severe disability was highest in the disabled people with onset age of 65 years and older. In the age group of 17 years and younger, the proportions of both mild and extremely severe disability were higher than those of moderate and severe disability ( $P < 0.001$ ).

### Service use of disabled people attributed to mental disorders by degrees of severity

Among disabled people attributed to mental disorders, 58.6% of them used some of the services [Table 4]. Among all degrees of severity of disabled people attributed to mental disorders, only 57.3–60.7% of them used services ( $P < 0.001$ ).

## DISCUSSION

There are some published papers describing the Second National Sample Survey on Disability in China. The current paper is secondary analysis of data in detail. The First National Sample Survey on Disability was conducted in 1987, and 1,579,314 individuals were investigated in 29 provinces of China. Among all kinds of disabilities including visual disability, hearing disability, physical disability, intellectual disability, and mental disability, number of people with disability attributed to mental disorders increased in 2006.<sup>[6,7]</sup> By estimation, nearly 2.61 million people suffer from disability attributed to mental disorders in China. It is assumed that changes of population structure, population amount, and the spectrum of disease have induced the increase of amount of mentally disabled people. Other reasons presumably involve the changes of the diagnostic criteria of mental disorders<sup>[8]</sup> (ICD-9 in 1987 vs. ICD-10 in 2006), high sensitivity of survey tools, strict quality control, and low missed rate<sup>[5,9]</sup> and the rising report rate due to the establishment and development of the social security system for disabled people.<sup>[10]</sup>

Regarding distribution of disability prevalence attributed to mental disorders, it showed that gender, residential area, marital status, education level, and economic area were related to distribution of prevalence attributed to mental disorders. These findings are consistent with previous descriptive studies.<sup>[3]</sup>

Among the 56 ethnic groups in China, the majority of Han ethnic group had higher disability prevalence rates attributed to mental disorders than the non-Han minority. The respondents in the Second National Sampling Survey on Disability were assessed whether they were disabled first and assessed the disability attribution afterward. The minority people might be more likely to underreport the disability and symptoms

**Table 4: Proportion of services use in disabled people with different degrees of severity (n = 15,928)**

Degree of severity	Number of disabled people	Proportion of service use (%)	$\chi^2$	P
Extremely severe	2961	60.7	13.485	<0.001
Severe	1332	58.6		
Moderate	1436	57.9		
Mild	3608	57.3		
Total	9337	58.6		

of mental disorders because of their languages, customs, and cultures. This may result in lower rate of disability attributed to mental disorders in the minorities. There are few cross-cultural researches on validity of the diagnostic criteria in minority people, so some cultural invalidity can possibly impact the result. There are also few researches on biological factors between the Han ethnic people with the disability attributed to mental disorders and non-Han minority people; therefore, the difference of disability rates between them is unable to account for biological factors. Further research on the relationship between ethnic groups and the disability attributed to mental disorders is needed.

It obviously shows that the older the disabled people were, the higher the disability prevalence rates were. One important reason is that dementia people are in older age groups, apparently contributing to the higher prevalence attributed to mental disorders in elderly people.<sup>[11]</sup> The other reason is that people with mental disorders could not cured effectively, resulting in disability with age growing.<sup>[12]</sup> It also shows that the proportion of extremely severe disability among four degrees of disabilities was highest in the disabled people with onset age of 65 years and over, indicating the most contribution of dementia people.<sup>[13]</sup>

Regarding region distribution of disability prevalence attributed to mental disorders, it assumes that higher prevalence in rural area is related to shortage of medical resource and mental health professionals. Meanwhile, the difference of prevalence in three economic areas may reflect unbalance of economic development from the east to the west area. To further explain the distribution of prevalence attributed to mental disorders, it is needed to analyze the data by multivariate method and cohort study in future.<sup>[14]</sup>

Regarding marriage distribution of disability prevalence attributed to mental disorders, it indicates that stable marital

status was a protective factor to disability attributed to mental disorders, resulting from close interpersonal relationship and harmonious family. Undesirable marital relations (divorced or widowed) and the disability attributed to mental disorders may interact each other. It is more likely that it is relatively difficult for the people with mental disorders to maintain stable marital status. The people with undesirable marital relations may also have higher risks to suffer from mental disorders. Therefore, more people with undesirable marital status were found in disabled people attributed to mental disorder.<sup>[15-17]</sup>

Regarding education level, the severer the people with disability attributed to mental disorders were, the less education opportunities they got. It should be paid attention for policy makers to provide more education opportunities and to establish more special education schools for people with disabilities.

According to the published papers, the proportions of service use in the disabled people attributed to visual, hearing, speech, physical, and intellectual disabilities were 48.5%, 33.4%, 41.3%, 59.3%, and 42.0%, respectively. However, it was the second highest in disability attributed mental disorders unexpectedly.<sup>[18]</sup> Even so, the proportion of it was only 58.6%. It concludes that service use of disabled people was inadequate as a whole in China. One reason of it is that people with disability attributed to mental disorders especially have stigma for service use. The other reason is that medical service and rehabilitation providing are not available and accessible in some undeveloped regions.

Some limitations of the paper should be noted. First, the paper does not include mental retardation in the Second China National Sample Survey on Disability. The people with mental retardation were classified intellectual disability in this survey. Second, there was recall bias in the survey, especially in the elderly. Age at onset might be recalled incorrectly. Third, the findings of this paper represented only disabled people with mental disorders, but may not be applicable to people who have mental disorders without disability or to other populations.

In summary, there are statistical differences of disability prevalence attributed to mental disorders by people and region in China at the point of epidemiological view. Age, gender, marital status, education level, ethnic group, and residential and economic region are related factors of disability attributed to mental disorders. Service use in disabled people with mental disorders is not sufficient. It should be advocated to promote mental health and rehabilitation for the people with disability attributed to mental disorder in China.

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### Conflicts of interest

There are no conflicts of interest.

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