Mental health service use and its associated factors among nurses in China: a cross-sectional survey

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ABSTRACT

Background. To facilitate mental health service planning for nurses, data on the patterns of mental health service use (MHSU) among nurses are needed. However, MHSU among Chinese nurses has seldom been studied. Our study aimed to explore the rate of MHSU among Chinese nurses and to identify the factors associated with MHSU.

Methods. A self-designed anonymous questionnaire was used in this study. MHSU was assessed by the question, "Have you ever used any kind of mental health services, such as mental health outpatient services or psychotherapies, when you felt that your health was suffering due to stress, insomnia, or other reasons?" The answer to the question was binary (yes or no). Sleep quality, burnout, and depressive symptoms were assessed using the Chinese version of the Pittsburgh Sleep Quality Index , the Chinese version of the Maslach Burnout Inventory-General Survey and the two-item Patient Health Questionnaire, respectively. Chi-square tests and binary logistic regression were used for univariate and multivariate analyses.

Results. A total of 10.94% (301/2750) of the nurses reported MHSU. 10.25% (282/2750) of the nurses had poor sleep quality, burnout and depressive symptoms, and only 26.95% of these nurses reported MHSU. Very poor sleep quality (OR 9.36, 95% CI [5.38-16.29]), mid-level professional title (OR 1.48, 95% CI [1.13-1.93]) and depressive symptoms (OR 1.66, 95% CI [1.28-2.13]) were independent factors associated with MHSU.

Conclusions. Most of the nurses have experienced burnout, poor sleep quality or depressive symptoms and the MHSU rate among them was low. Interventions to improve the mental health of nurses and to promote the use of mental health services are needed.

Subjects Health Policy, Nursing, Psychiatry and Psychology, Public Health
Keywords Nurse, Sleep quality, Burnout, Depression, Mental health service use

INTRODUCTION

Mental health problems are a significant global problem and cause a severe burden on both patients and society according to the Global Burden of Disease Study 2017 (*Kyu et al., 2018*). A recent study conducted in China reported that the lifetime prevalence of mental health disorders was 16.6% (*Huang et al., 2019*). Research suggests that nurses are one of the highest-risk groups for developing mental health problems due to their stressful and demanding work (*Drury et al., 2014*). Previous studies have reported depression, anxiety and insomnia as the most common mental health problems experienced by nurses, and that the prevalence of depression in nurses has shown an increasing trend (*Pappa et al., 2020*). Nurses suffer from depression at almost twice the rate of individuals working in other professions (*Brandford & Reed 2016*; *Ren et al., 2019*; *Saeedi Shahri et al., 2017*). According to a meta-analysis of 102 studies, the overall prevalence of depressive symptoms in Chinese nurses was 43.8% (*Xie et al., 2020*). The pooled prevalence of poor sleep quality among nurses was 61.0% according to a meta-analysis of 53 studies (*Zeng et al., 2020*). Several studies have also examined the prevalence of burnout among nurses. The pooled prevalence of high burnout symptoms among global nurses was 11.2% according to a meta-analysis of 61 studies (*Woo et al., 2020*). Burnout has negative consequences on the mental health of nurses through the association with fatigue, anxiety, sleep disorders as well as impaired concentration and memory (*Woo et al., 2020*). Mental health problems and burnout may lead to reduced job satisfaction and performance among nurses (*Adriaenssens, De Gucht & Maes, 2015*; *Liu et al., 2018b*), threatening the safety of patients (*Garcia et al., 2019*; *Garrouste-Orgeas et al., 2015*; *Zhou et al., 2016*). For example, the frequency of medication errors has been significantly associated with mental health problems among nurses (*Di Simone et al., 2020a*; *Garrouste-Orgeas et al., 2015*). Therefore, preventing and managing mental health problems among nurses is highly important, not only for their health but also for the delivery of good-quality healthcare services.

Several studies have reported on mental health service use (MHSU) and its correlates among medical staff (*Adams et al., 2010*; *Jones, Whybrow & Coetzee, 2018*; *Sullivan, Camic & Brown, 2015*). In a study conducted among 678 military doctors in the United Kingdom, 46.1% of them reported stress-related, mental health or emotional problems during the past three years. Among the military doctors in that study who had experienced these problems, 35.6% reported having sought help from formal sources, including mental health specialists and doctors as well as online and telephone therapists (*Jones, Whybrow & Coetzee, 2018*). The MHSU rate in that professional group was slightly lower than in the general population, which has been reported to be 38.9% in New Zealand (*Foliaki et al., 2006*). Some sociodemographic factors, such as single status, male gender and lower level of education, have been identified as factors associated with MHSU (*Harris et al., 2016*). In addition, mental health problems such as depression and sleep problems have been shown to be significant predictors of MHSU (*Liu et al., 2018a*; *Yin et al., 2019*). Burnout has been shown to be prevalent among nurses and to be associated with mental illness (*Maslach & Leiter, 2016*). It may also be a predictor of MHSU; however, few study has been done to explore the associations among them.

Therefore, to facilitate mental health service planning for nurses, data on the patterns of MHSU among nurses are needed. Several studies have been conducted among Chinese nurses and nursing students to explore their attitudes towards MHSU (*Halter, 2004*; *Mitchell, 2018*). However, to the best of our knowledge, no study has reported on MHSU and its associated factors among Chinese nurses. Therefore, this study aimed to explore the rate of MHSU among Chinese nurses, to identify the sociodemographic and occupational variables that are significantly associated with MHSU and to investigate the associations among sleep quality, burnout, depressive symptoms and MHSU.

MATERIALS & METHODS

Participants and procedure

Data were collected as previously described in *Tian et al. (2020)*. In this cross-sectional study, a convenience sample was collected using a self-designed anonymous WeChat-based questionnaire. A link to this questionnaire was sent to 30 nurses who were selected as "original deliverers" via social media (WeChat). On the first page of the questionnaire, the introduction to the study was shown, and participants chose "agree" to continue or "disagree" to quit. Then, the "original deliverers" invited their colleagues to participate in the survey. The questionnaire was also distributed among the respondents' friends and the WeChat groups. Subsequently, the size of the sample increased. The target group of this study consisted of actively employed clinical nurses from different departments across the different levels of hospitals, except nurses on maternal or sick leave.

Measures

Sociodemographic information, including sex, age group, marital status (married and unmarried, where unmarried means single, including never married, divorced, lost partner), and level of education, was included in the questionnaire. Occupational information included professional title, level of hospital, work schedule (shift or non-shift), years of experience and weekly working hours. Respondents were also asked to answer the question "Have you ever used any kind of mental health services, such as mental health outpatient services or psychotherapies, when you felt that your health was suffering due to stress, insomnia or other reasons?" The answer to the question was binary (yes or no).

Sleep quality was assessed using the Chinese version of the Pittsburgh Sleep Quality Index (C-PSQI, Cronbach's $\alpha = 0.77$) (*Tsai et al., 2005*). The C-PSQI consists of 18 items to evaluate seven aspects of sleep in the past month, including subject sleep quality, sleep duration, sleep latency, sleep efficiency, sleep disturbances, use of sleep medication (no use, less than once a week, once or twice a week, three or more times a week), and daytime dysfunction. The score of each component ranges from 0 to 3, the total score is the sum of the component scores and ranges from 0 to 21. Sleep quality is divided into four categories according to the total score (very good = 0–5, fairly good = 6–10, fairly poor = 11–15, very poor = 16–21) (*Tsai et al., 2005*).

Burnout was assessed by the Chinese version of the Maslach Burnout Inventory-General Survey (CMBI-GS) (*Liu et al., 2018b*; *Liu & Aungsuroch, 2019*). The scale consists

of 15 items and three subscales: emotional exhaustion, depersonalization, and personal accomplishment. The response options for each item are rated from 0 (never) to 6 (daily) based on the frequency of occurrence of the specific job-related feelings of the respondent. The scores of the three subscales are equal to the average item score for each of the subscales. The total burnout score is the sum of the three subscale scores and ranges from 0 to 18, with a higher score indicating a higher level of burnout (low level = 0–8.5, serious level = 8.5–14.2, extremely serious level = 14.2–18) (*Liu et al., 2018b*). In this study, the Cronbach's α for the CMBI-GS was 0.86.

Depressive symptoms were assessed using the two-item Patient Health Questionnaire (PHQ-2), which has shown good sensitivity and specificity (*Arrieta et al., 2017*; *Mitchell et al., 2016*). The PHQ-2 comprises the first two items of the PHQ-9 that evaluates the frequency of depressed mood and the experience of little interest or pleasure in doing things over the past 2 weeks. The items are rated on a 4-point scale ranging from 0 (not at all) to 3 (nearly every day), for a total score ranging from 0 to 6. A cut-off point of 4 has been found to have good sensitivity and specificity for screening for depression (*Lakkis & Mahmassani, 2015*). In this study, depressive symptoms were described as negative or positive based on the PHQ-2 score (0–4 = negative, 5–6 = positive).

Statistical analyses

The distribution of occupational and sociodemographic data and the rates of lifetime MHSU were reported as numbers and percentages. The independent factors associated with MHSU in the chi-square test ($P < 0.1$), including marital status, professional title, years of experience, sleep quality, burnout level and depressive symptoms, were included in subsequent multivariate logistic regression analyses to identify significant factors associated with dependent variable MHSU. All analyses were performed using SPSS Version 21 (IBM).

Ethical consideration

All procedures involving human participants were performed under the ethical standards of the institutional and national research committee and with the Declaration of Helsinki. This study was approved by the ethics committee of the National Clinical Research Center of Second Xiangya Hospital (No. 2018S007).

RESULTS

A total of 2768 nurses from 23 provinces of mainland China responded to the questionnaire. The responses of 18 nurses were excluded due to incomplete data. Among the 2750 respondents, 64.36% were married (35.64% were unmarried), 94.22% were female, 69.67% worked in tertiary-level hospitals, 66.15% held a junior professional title and 75.2% were shift workers. The respondents were aged 18 to 57, and 52.95% of them were below the age of 30. Their mean age was 30.58 ± 6.94 years (Table 1).

The rate of lifetime MHSU among the responding nurses was 10.94% (301/2750). The nurses with mid-level professional titles were more likely to use mental health services (13.77% $\chi^2 = 8.682$, $p = 0.013$) than those with different professional titles. Sleep quality ($\chi^2 = 131.389$, $p < 0.001$) was significantly associated with MHSU among the nurses, and

Table 1 Distribution of lifetime MHSU by demographic, occupational and personal variables.

Demographic, occupational or personal variables	n=2750 N (%)	Lifetime MHSU		χ^2	P
		No use N (%)	Any use N (%)		
Sex					
Male	159(5.78)	142(89.31)	17(10.69)		
Female	2591(94.22)	2307(89.04)	284(10.96)	0.011	0.916
Age group (yrs.)					
<30	1456(52.95)	1311(90.04)	145(9.96)		
30–39	956(34.76)	845(88.39)	111(11.61)		
≥40	338(12.29)	293(86.69)	45(13.31)	3.833	0.147
Marital status					
Married	1770(64.36)	1562(88.25)	208(11.75)		
Unmarried	980(35.64)	887(90.51)	93(9.49)	3.310	0.074
Education level					
Master's degree or above	169(6.15)	149(88.17)	20(11.83)		
Bachelor's degree	1888(68.65)	1668(88.35)	220(11.65)		
Associate degree or below	693(25.20)	632(91.20)	61(8.80)	4.371	0.112
Level of hospital					
Tertiary hospital	1916(69.67)	1695(88.47)	221(11.53)		
Secondary hospital	761(27.67)	689(90.54)	72(9.46)		
Primary/community hospital	73(2.66)	65(89.04)	8(10.96)	2.402	0.301
Professional title					
Senior	183(6.65)	167(91.26)	16(8.74)		
Mid-Level	748(27.20)	645(86.23)	103(13.77)		
Junior	1819(66.15)	1637(89.99)	182(10.01)	8.682	0.013
Work schedule					
Shift	2068(75.20)	1831(88.54)	237(11.46)		
Non-shift	682(24.80)	618(90.62)	64(9.38)	2.268	0.138
Weekly working hours					
>50 h	231(8.40)	202(87.45)	29(12.55)		
40–50 h	1688(61.38)	1516(89.81)	172(10.19)		
<40 h	831(30.22)	731(87.97)	100(12.03)	2.612	0.271
Years of experience					
<5	1041(37.86)	948(91.07)	93(8.93)		
6–10	871(31.67)	767(88.06)	104(11.94)		
11–20	533(19.38)	468(87.80)	65(12.20)		
>20	305(11.09)	266(87.21)	39(12.79)	7.122	0.068
Sleep quality					
Very good	526(19.13)	492(93.54)	34(6.46)		
Fairly good	1444(52.51)	1331(92.17)	113(7.83)		
Fairly poor	691(25.13)	573(82.92)	118(17.08)		
Very poor	89(3.24)	53(59.55)	36(40.45)	131.389	**<0.001**

Table 1 (*continued*)

Demographic, occupational or personal variables	n=2750	Lifetime MHSU		χ^2	P
	N (%)	No use N (%)	Any use N (%)		
Burnout level					
Low	1027(37.35)	947(92.21)	80(7.79)		
Serious	1349(49.05)	1183(87.69)	166(12.31)		
Extremely serious	374(13.60)	319(85.29)	55(14.71)	18.478	**<0.001**
Depressive symptoms					
Negative	2224(80.87)	2029(91.23)	195(8.77)		
Positive	526(19.13)	420(79.85)	106(20.15)	56.558	**<0.001**

Table 2 Factors associated with MHSU among nurses.

Associated factor		OR (95% CI)	P
Professional title (Ref. Junior)	**Senior**	1.040(0.602–1.797)	0.888
	Mid-Level	1.479(1.131–1.934)	0.004
Sleep quality (Ref. Very good)	**Very poor**	9.358(5.377–16.285)	<0.001
	Fairly poor	3.170(2.114–4.752)	<0.001
	Fairly good	1.416(0.945–2.120)	0.091
Depressive symptom (Ref. Negative)	**Positive**	1.655(1.283–2.133)	<0.001

40.45% (36/89) of the nurses who had very poor sleep quality used mental health services. Burnout ($\chi^2 = 18.478$, $p < 0.001$) and depressive symptoms ($\chi^2 = 56.558$, $p < 0.001$) were significant factors associated with MHSU. Among the nurses with extremely serious level of burnout, 14.71% (55/374) used mental health services, and 20.15% (106/526) of the nurses with depressive symptoms used mental health services. Among the nurses who had experienced depressive symptoms, burnout and poor sleep, 26.95% (76/282) reported MHSU.

As shown in Table 2, the multivariate logistic regression analyses showed that very poor sleep quality ($p < 0.001$), mid-level professional title ($p = 0.004$) and depressive symptoms ($p < 0.001$) were significant factors associated with MHSU, with odds ratios of 9.358 (95% CI [5.377–16.285]), 1.479 (95% CI [1.131–1.934]) and 1.655 (95% CI [1.283–2.133]), respectively.

DISCUSSION

To the best of our knowledge, this study of MHSU and its associated factors is the first to be conducted among Chinese nurses. Only 10.94% of the respondents reported MHSU, and the nurses who had very poor sleep quality were approximately ten times more likely to seek mental health services than nurses who had very good sleep quality. Mid-level professional title and depressive symptoms were also independent factors associated with MHSU among the nurses.

The rate of MHSU among the nurses with depressive symptoms, poor sleep quality or burnout was low in this study. This study showed that among the nurses who experienced extremely serious burnout, only 14.71% reported MHSU. Among nurses who experienced burnout, depressive symptoms and poor sleep quality, 26.95% reported MHSU. This rate was lower than the MHSU rate (35.6%) among military doctors who reported experiencing stress, mental health or emotional problems in a survey conducted in the United Kingdom (*Jones, Whybrow & Coetzee, 2018*). Of the responding nurses in this study, 3.2% reported very poor sleep quality, and their MHSU rate was only 40.4%. A previous study revealed that nurses were more likely to seek medical help for sleep problems than for anxiety or depression (*Huang et al., 2018*). Poor sleep quality has serious negative consequences on physical and mental health and quality of life, such as fatigue, burnout, hypertension and depression (*Furihata et al., 2020*; *Kim et al., 2018*; *Togo, Yoshizaki & Komatsu, 2017*). Additionally, some studies have found that poor sleep to be highly associated with impaired cognitive performance, such as impaired concentration and memory, which may lead to poor work performance and even affect patient safety (*Di Simone et al., 2020b*). In addition, approximately half of the nurses who used sleep medication more than three times a week reported no MHSU. The use of hypnotics has beneficial effects in relieving insomnia symptoms. However, hypnotics have side effects which include muscle relaxation and "hangover" that may influence daytime function, resulting in negative effects on work efficiency and safety (*Futenma et al., 2015*; *Lader, 2014*) and leading to the risk of dependence addiction (*Licata & Rowlett 2008*). There are several possible reasons why nurses with poor sleep quality take sleep medicine frequently without consulting a psychiatrist, including self-prescribing and seeking help from other healthcare professionals. Medical staff have often been reported to attempt to conceal their health problems from other people by self-prescribing (*Adams et al., 2010*). Nurses have easy access to sleep medications such as benzodiazepines, which are not available over the counter due to government policies. In addition, some supplements for improving sleep quality, such as melatonin, are available in pharmacies and are widely used (*Pereira et al., 2020*). Some nurses may visit a general physician or a neurologist due to stigma or a lack of mental health knowledge. Mental health services include pharmacological and non-pharmacological therapies for sleep disorders. Psychiatrists can prescribe sleep medications that have few side effects and that are less likely to lead to dependence. Some non-pharmacological therapies, such as cognitive-based therapy for insomnia, sleep hygiene education and aromatherapy, have been proven to be effective and have no side effects (*Booker et al., 2020*; *Fang & Li, 2015*; *Sun et al., 2019*).

Mid-level professional title was revealed to be a significant factor associated with MHSU in both the univariate and multivariate analyses. The nurses with mid-level professional titles were most likely to use mental health services, followed by the nurses with junior professional titles and nurses with senior professional titles. In China, nurses with mid-level professional titles are the backbone of the nursing workforce. These nurses are responsible for not only patient care in their wards but also clinical teaching and administration work, such as quality control. They have more responsibility and work under higher pressure than nurses with different professional titles, which places them at a greater risk of mental

health problems. Therefore, they are more likely to use mental health services. Nurses with senior professional titles in China are mostly nursing teachers working in nursing schools or administrators in nursing departments in hospitals who have a lighter workload than clinical nurses and tend to lead a regular lifestyle without night shifts. In addition, as a "face-saving approach," they are more likely to underreport their MHSU.

Many studies have reported the barriers and facilitators of MHSU among medical staff, which were not examined in this study. A systematic review revealed that personal beliefs about mental health and mental health treatment, especially concerns about public stigma, were a significant factor related to the reluctance of medical staff to seek mental health services when needed (*Vogt DJPs, 2011*). Barriers such as concerns about confidentiality, career progression as well as the opinions of patients and colleagues were also reported (*Adams et al., 2010*). For nurses, the most highly rated barriers to seeking assistance for mental health problems were fear of embarrassment and concerns about losing their licence (*Cares et al., 2015*). In addition, mental health resources are scarce and distributed disproportionately in China, and there are only 28 thousand psychiatrists nationwide according to the 2018 national health yearbook (*Commission, 2018*). Therefore, it is difficult for nurses to access mental health services.

Strengths and limitations of the study

The findings on the prevalence and the significant associated factors of MHSU in this study provide useful and valuable information to help health decision-makers properly implement interventional programs and prevention activities. Some limitations of this study should be highlighted. First, the information was collected through retrospective self-reports, which potentially resulted in recall bias. Second, this study was an online cross-sectional survey, and although 2750 nurses from mainland China responded, compared to the large population of Chinese nurses, the sample was small. Therefore, the representativeness of the sample was limited, and the prevalence measured in this study cannot fully represent the MHSU status among all Chinese nurses.

CONCLUSIONS

The mental health status of nurses remains a serious problem. Most of the nurses in this study experienced burnout, depressive symptoms or poor sleep quality. The MHSU rate among the nurses in this study was low, and many associated factors were identified. Nurses with depressive symptoms or poor sleep quality and those with a mid-level professional title were more likely to seek mental health services. Interventions to improve the mental health status of nurses and to promote the use of mental health services are urgently needed.

ACKNOWLEDGEMENTS

ADDITIONAL INFORMATION AND DECLARATIONS

Competing Interests

The authors declare there are no competing interests.

Author Contributions

- Yusheng Tian, Yuchen Yue and Jianjian Wang performed the experiments, authored or reviewed drafts of the paper, and approved the final draft.
- Xiaoli Liao conceived and designed the experiments, performed the experiments, analyzed the data, prepared figures and/or tables, and approved the final draft.
- Man Ye and Yiting Liu analyzed the data, prepared figures and/or tables, and approved the final draft.
- Yamin Li and Jiansong Zhou conceived and designed the experiments, authored or reviewed drafts of the paper, and approved the final draft.

Human Ethics

The following information was supplied relating to ethical approvals (i.e., approving body and any reference numbers):

The ethics committee of national clinical research center in the second Xiangya Hospital approved the study (2018S007).

Data Availability

The following information was supplied regarding data availability:

Raw data is available in the Supplementary Files.

Supplemental Information

Supplemental information for this article can be found online at http://dx.doi.org/10.7717/peerj.11181#supplemental-information.

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