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A cross-sectional epidemiological study of non-suicidal self-injury prevalence in Chinese psychiatric patients

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Non-suicidal self-injury (NSSI) is a common behaviour among psychiatric patients that is easily overlooked and often brings serious consequences. The current literature is limited to certain groups and uses different diagnostic criteria. Here our aim was to investigate the prevalence of NSSI in psychiatric patients in China. Diagnostic and Statistical Manual of Mental Disorders, fifth edition diagnostic criteria were used to conduct a 2-week cross-sectional survey of all psychiatric patients presenting to 15 hospitals in 14 cities across 8 provinces in China during this period. A total of 3,298 psychiatric patients were included. The highest prevalence of NSSI behaviour was found in adolescents aged 10–19 years (14.3%). The prevalence of NSSI behaviour in females in outpatients (16.9%) and inpatients of child and adolescent psychiatric departments (19.6%), outpatients (5.9%) and inpatients adult psychiatric departments (7.7%) was significantly higher than in males. The prevalence of NSSI behaviour in patients with personality disorders was significantly higher than in any other diagnostic group (46.7%, $\chi^2 = 195.239$, $P < 0.000$). The prevalence of NSSI in psychiatric patients is high, especially in adolescents. Therefore, it is necessary to inform patients and medical workers to effectively treat and manage NSSI.

Non-suicidal self-injury (NSSI) is defined as repetitive, direct and deliberate destruction of one's body tissue without an intention to die[1]. Despite being an obviously negative, harmful behaviour, many people use this method to regulate their emotions[2], influence others when less intense forms of communication fail[3] or deal with peer and family pressure. Although NSSI is self-injurious behaviour without suicidal intent, according to the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5) diagnostic criteria, self-injury predicts

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Table 1 | Prevalence of NSSI in patients with mental disorders

Category	Number of patients	Number of patients with NSSI behaviour	Prevalence (%)	Number of patients with NSSI diagnosis	Prevalence (%)
Total patients	3,298	331	10.0	221	6.7
Outpatients	2,380	212	8.9	161	6.8
Inpatients	918	119	13.0	60	6.5
Outpatients of child and adolescent psychiatry departments	767	90	11.7	82	10.7
Inpatients of child and adolescent psychiatry departments	206	32	15.5	25	12.2
Outpatients of psychiatry departments	1,613	122	7.6	79	4.9
Inpatients of psychiatry departments	712	87	12.2	35	4.9

stronger suicidal ideation[4], and studies have reported a notable increase in the overall incidence of suicide-related deaths among outpatients and inpatients with history of self-injury[5]. Further research into NSSI is needed to understand and address this behaviour.

Several epidemiological NSSI studies have been conducted in other countries. In Austria, 6.91% of adolescents performed NSSI more than five times in their lifetime[6]. The lifetime prevalence of NSSI among adolescents was found to be 18.56% in Mexico, using a questionnaire created to assess NSSI. Among them, only 6.96% of the self-injured subjects met the DSM-5 diagnostic criteria[7]. In Belgium, the 12 month NSSI prevalence rate was 0.8% for incoming college students in Leuven[8]. A meta-analysis by Swannell et al. found an estimated NSSI rate of 17.2% in adolescents and emphasized the importance of NSSI research using standardized tools[9]. From previous research, it can be seen that NSSI is a worldwide phenomenon and requires attention[10], at least in Western countries. Current estimates of the prevalence of NSSI vary widely. Differences in NSSI measurement tools make cross-country comparisons of NSSI difficult, which hinders the understanding of the occurrence of NSSI[6,10]. NSSI was introduced into the DSM-5 in 2013 as a distinct syndrome, so its diagnostic criteria should be used to obtain more accurate estimates of NSSI prevalence[11]. Most previous studies performed in China have been conducted in a single province or municipality, and none have attempted to use the proposed DSM-5 criteria to determine the prevalence of NSSI nationwide.

Studies have reported that, among adolescents with mental disorders, 60% have self-injured and 50% have repeated self-injury behaviours[12]. NSSI behaviour in adolescents is also a strong predictor of future suicide attempts[13]. As a result, most of the current literature on self-injury focuses on adolescents but ignores the occurrence of NSSI in other age groups. Children between the ages of 7 and 11 years who are exposed to maternal criticism have a greater risk of lifelong self-injury, especially girls[14]. This goes to show that NSSI is an important clinical phenomenon across multiple age groups[15,16]. Among lifetime NSSI patients, 59.6% meet the criteria for at least one mental disorder[17], and patients without a mental disorder are more likely to be diagnosed with one[18]. Studies have shown that 87.5% of people with borderline personality disorder will develop NSSI in their lifetime[19]. In patients with bipolar disorder, the prevalence of NSSI is 55.3%[20]. These patients have an increased mortality rate[5]. Mentally ill patients who self-injure need our attention.

Current clinical studies use small sample sizes and are limited to certain age groups, regions or populations, which may not accurately reflect the prevalence of NSSI[21]. Nock argues that the need for the accurate prevalence of NSSI in community and clinical samples in the general population is critical for understanding the occurrence of NSSI and allocating medical services and other resources[22]. In this Article, we used a large, nationally representative sample of patients of all ages with mental disorders to investigate the prevalence of NSSI behaviour in China according to the DSM-5 diagnostic criteria.

Research in context

Evidence before this study. We searched PubMed, Web of Science, WanFang and China National Knowledge Infrastructure databases without language restrictions from 1 January 1970 to 1 October 2021 for original studies of the prevalence of people with NSSI behaviour in China. For PubMed and Web of Science, we used the search terms 'Non-Suicidal Self-Injury', 'NSSI', 'self-injury', 'self injury', 'deliberate self-injury', 'deliberate self-harm', 'self-harm', 'self harm', 'mental disorder', 'mental disease', 'psychiatric', 'psychiatric patients', 'patients with mental disorder', 'outpatients with mental disorder', 'inpatients with mental disorder', 'prevalence', 'incidence', 'epidemiology', 'cross-sectional study', 'China', 'Chinese' and 'survey'. The search terms for the WanFang and China National Knowledge Infrastructure databases are provided in the Supplementary Information. Although the prevalence of NSSI in patients with mental disorders is very low in China, since 2008, several regional surveys have been conducted to describe the epidemiology of self-injury in the adolescent population in China. However, owing to the different definitions of self-injury and different survey methods applied, these results are not comparable.

Added value of this study. This is the first national multi-centre survey of NSSI behaviour among patients presenting with mental disorders using the DSM-5 recommended diagnostic criteria. This study was not limited to the investigation of patients in a specific age group and was conducted to explore the prevalence of NSSI behaviours at each age level.

Implications of all the available evidence. This detailed profile of the prevalence of NSSI in patients with mental disorders will inform mental health policy-making, planning and evaluation in China. In the clinic, it can provide effective suggestions for the prevention and targeted treatment of NSSI behaviour. In China, more attention should be paid to NSSI behaviour in patients with mental disorders.

Results

Between 1 July and 31 August 2019, 3,407 individuals were invited to participate in the survey. One hundred nine patients were excluded because they did not meet at least one mental disorder diagnosis according to DSM-5. A total of 15 hospitals participated in this survey, including 8 general hospitals and 7 psychiatric hospitals, all located in urban areas. The specific characteristics, location and number of subjects admitted to each hospital are presented in Supplementary Table 1 and include 11 outpatient psychiatry departments, 9 inpatient psychiatry departments, 5 outpatient child and adolescent psychiatry departments and 4 inpatient child and adolescent psychiatry departments. Ultimately, 3,298 individuals were selected for the survey. Among them, 1,257 (38.1%) subjects were from the east of China, 1,173 (35.56%) from the west, 722 (21.89%) from the south and 146 (4.43%) from the north. There

Table 2 | Classification of mental disorders in patients who met the NSSI diagnosis and with at least one diagnosis of mental disorder according to DSM-5 (*n*=195)

Category	Frequency	%
Depressive disorders	115	59.0
Bipolar and related disorders	36	18.5
Personality disorders	21	10.8
Obsessive–compulsive and related disorders	7	3.6
Schizophrenia spectrum and other psychotic disorders	7	3.6
Trauma- and stressor-related disorders	3	1.5
Disruptive, impulse-control and conduct disorders	2	1.0
Anxiety disorders	2	1.0
Somatic symptoms and related disorders	1	0.5
Substance-related and addictive disorders	1	0.5

were 2,380 outpatients and 918 inpatients. Among the 2,380 outpatients, 982 (41.3%) were male and 1,398 (58.7%) were female. Among the 918 inpatients, 423 (46.1%) were male and 495 (53.9%) were female (Supplementary Table 2).

Of the total 3,298 selected individuals, 3,135 met at least one mental disorder diagnosis according to DSM-5, while 163 did not. The frequency of various mental disorders is presented in Supplementary Table 3.

Among the 3,298 patients, 331 (10.0%) exhibited NSSI behaviour and 221 (6.7%) had an NSSI diagnosis. Among the 2,380 outpatients, 212 (8.9%) exhibited NSSI behaviour and 161 (6.8%) had an NSSI diagnosis. Among the 767 outpatients from the child and adolescent psychiatry departments, 90 (11.7%) exhibited NSSI behaviour and 82 (10.7%) had an NSSI diagnosis. Among the 1,613 outpatients from the adult psychiatry departments, 122 (7.6%) exhibited NSSI behaviour and 79 (4.9%) had an NSSI diagnosis. Among the 918 inpatients, 119 (13.0%) exhibited NSSI behaviour and 60 (6.5%) had an NSSI diagnosis. Among the 206 inpatients from the child and adolescent psychiatry departments, 32 (15.5%) exhibited NSSI behaviour and 25 (12.2%) had an NSSI diagnosis. Among the 712 inpatients of the adult psychiatry departments, 87 (12.2%) exhibited NSSI behaviour and 35 (4.9%) had an NSSI diagnosis (Table 1).

Among the 221 patients with an NSSI diagnosis, 195 met at least one mental disorder diagnosis according to DSM-5, whereas 26 did not. One hundred fifteen (59.0%) were diagnosed with a depressive disorder, 36 (18.5%) were diagnosed with bipolar and related disorders, 21 (10.8%) were diagnosed with personality disorders, 7 (3.6%) were diagnosed with obsessive–compulsive and related disorders, 7 (3.6%) were diagnosed with schizophrenia spectrum and other psychotic disorders, 3 (1.5%) were diagnosed with trauma- and stressor-related disorders, 2 (1.0%) were diagnosed with disruptive, impulse-control and conduct disorders, 2 (1.03%) were diagnosed with anxiety disorders, 1 (0.51%) was diagnosed with a somatic symptom and related disorder and 1 (0.5%) was diagnosed with a substance-related and addictive disorder (Table 2).

The distribution of NSSI diagnoses across mental disorders was as follows: personality disorders (46.7%), bipolar and related disorders (10.7%), depressive disorders (9.8%), substance-related and addictive disorders (8.3%), disruptive, impulse-control and conduct disorders (7.7%), obsessive–compulsive and related disorders (6.9%), trauma- and stressor-related disorders (5.3%), schizophrenia spectrum and other psychotic disorders (1.2%), somatic symptoms and related disorders (1.2%) and anxiety disorders (0.5%). The prevalence of an NSSI diagnosis varied greatly ($\chi^2 = 195.239$, $P < 0.000$), with patients who had personality disorders demonstrating a significantly higher prevalence than those with any other mental disorder (Table 3).

Table 3 | Prevalence of NSSI in mental disorders

Category	Number of patients without NSSI diagnosis (%)	Number of patients with NSSI diagnosis (%)	χ^2	*P* value
Mental disorder				
Depressive disorders	1,053 (90.2)	115 (9.8)	195.239	0.000
Bipolar and related disorders	302 (89.3)	36 (10.7)		
Personality disorders	24 (53.3)	21 (46.7)		
Obsessive–compulsive and related disorders	95 (93.1)	7 (6.9)		
Schizophrenia spectrum and other psychotic disorders	595 (98.8)	7 (1.2)		
Trauma- and stressor-related disorders	54 (94.7)	3 (5.3)		
Disruptive, impulse-control and conduct disorders	24 (92.3)	2 (7.7)		
Anxiety disorders	396 (99.5)	2 (0.5)		
Somatic symptoms and related disorders	84 (98.8)	1 (1.2)		

Chi-squared tests (two tailed, unadjusted) were conducted for the variables.

Among the 221 patients with an NSSI diagnosis, demographic information was collected on 179 people and 42 refused entry to the experiment, Among them, 138 (77.1%) were aged 10–19 years and 31 (17.3%) aged 20–29 years, 66 (36.9%) were high school students and 50 (27.9%) were junior high school students, 128 (71.5%) were urban residents, 90 (50.3%) were only children, 167 (93.2%) had no religious belief and 22 (12.3%) had a family history of a mental disorder (Table 4).

The prevalence of an NSSI diagnosis differed according to age ($\chi^2 = 187.461$, $P < 0.000$). Among the 221 patients with an NSSI diagnosis, the youngest was 12 years old and the oldest was 56 years old. NSSI was detected most frequently in 16-year-olds, but not at all in patients 60 years and older (Fig. 1). The prevalence of an NSSI diagnosis was 166 (14.3%) between the ages of 10 and 19 years, 33 (7.0%) between the ages of 20 and 29 years, 11 (3.3%) between the ages of 30 and 39 years, 8 (1.9%) between the ages of 40 and 49 years, 3 (0.7%) between the ages of 50 and 59 years and 0 for patients 60 years or older. Patients aged 10–19 years and 20 to 29 years had the highest prevalence of NSSI (Table 5).

The prevalence of an NSSI diagnosis across all psychiatry departments showed clear gender differences. Females displayed significantly higher rates than males among outpatients of child and adolescent psychiatry departments ($\chi^2 = 31.322$, $P < 0.000$), inpatients of child and adolescent psychiatry departments ($\chi^2 = 11.723$, $P = 0.001$), outpatients of adult psychiatry departments ($\chi^2 = 6.094$, $P = 0.014$) and inpatients of adult psychiatry departments ($\chi^2 = 14.472$, $P < 0.000$) (Supplementary Table 4).

Discussion

The results of this study showed that the prevalence of NSSI in outpatients and inpatients was 6.8% and 6.5%, respectively. Among outpatients, 4.9% were outpatients of adult psychiatric departments and 10.7% were outpatients from child and adolescent psychiatry departments. Among inpatients, 4.9% were inpatients from adult psychiatric departments and 12.2% were inpatients from child and adolescent psychiatry departments. The outpatient prevalence we report is similar to the findings of Ose et al., who found a prevalence of 8.1% in a national study of NSSI prevalence among adult psychiatric outpatients in Norway[23]. In terms of inpatient prevalence, Groschwitz et al.[24] detected an NSSI prevalence of 37.0% in patients aged 12–19 years hospitalized

Table 4 | Demographic information for subjects with an NSSI diagnosis

	n	%
Age (years)		
10–19	138	77.1
20–29	31	17.3
20–39	8	4.5
40–49	2	1.1
Gender		
Male	30	16.8
Female	149	83.2
Education		
Primary school	2	1.1
Junior high school	50	27.9
Technical secondary school	14	7.8
High school	66	36.9
Junior college	12	6.7
Bachelor's degree	34	19.0
Master's degree or above	1	0.6
Registered residence		
Rural	128	71.5
Town	51	28.5
Only child		
Yes	90	50.3
No	89	49.7
Religious belief		
Yes	12	6.7
No	167	93.2
Family history of mental disorder		
Yes	22	12.3
No	157	87.7

for a psychiatric disorder in Germany[24], which is considerably higher than the rate we report. This is attributable to the fact that they did not perform a cross-sectional epidemiological study and the sample they used was small ($N = 111$) and from a specific group. In this study, DSM-5 diagnostic criteria for NSSI were strictly used, and only patients who met the six diagnostic criteria were diagnosed with NSSI. In addition, the participants in this study were patients of all ages from psychiatric departments, including children, adolescents and adults. Among adults aged 40–60 years, NSSI was detected only sporadically, while no patients over 60 years old were diagnosed with NSSI. As we surveyed patients with mental disorders at all ages and used strict diagnostic criteria, the overall prevalence of NSSI in this study may be lower than that of similar studies.

The results showed that the prevalence of NSSI in adolescents aged 10–19 years was 14.3%, and the prevalence in young adults aged 20–29 years was 7.0%, significantly higher than in any other age group. This trend is consistent with previous research. For example, Ose et al.[23] also found that the prevalence of NSSI was highest between the ages of 18 and 23 years and decreased with age[23]. Swannell found the same pattern in a community population, with an NSSI prevalence of 17.2% in adolescents, 13.4% in young adults and 5.5% in adults[9]. The incidence of NSSI behaviour is consistent among adolescents and young adults, in both clinical samples and community samples, hence mental health in these two groups requires more attention. The results showed that the prevalence of NSSI in people aged 30–39 years was 3.3%, and it decreased with increasing age. This differs from the prevalence of NSSI in Norwegian psychiatric outpatient clinics, which is 8.04%[23], and in England, where adults aged 30–39 years had a prevalence of NSSI of 6.00%[25], which may be caused by the different diagnostic criteria of NSSI. This study made the diagnosis of self-injury according to the DSM-5 diagnostic criteria, and also found that the detection rate of NSSI in patients older than 30 years decreased with increasing age. Patients with NSSI behaviour were more than seven times more likely to have suicide attempts than those without NSSI behaviour[23]. NSSI in adults in mental health clinical settings also needs attention.

In terms of gender differences, the results showed that the prevalence of NSSI in females was significantly higher than in males. This was true for the various outpatient and inpatient categories as well as the total population overall. However, there is no consistent conclusion about differences in prevalence according to gender. Most studies tend to point to a significantly higher prevalence in women[9,24,26,27], while others report a significantly higher prevalence in men[28]. Some studies reported no gender differences at all[29], and the DSM-5 seems to agree[30]. Be that as it may, most of the patients who exhibited NSSI behaviour in this study were suffering from some type of depressive disorder. It is widely known that women and female adolescents are more likely to suffer from depression than their male counterparts[31]. Moreover, we found that adolescents had the highest prevalence of NSSI out of any age group. Adolescent females with mental disorders may be more likely to experience negative emotions and have a greater need for emotional regulation[32]. Therefore, more attention should be paid to NSSI in female patients with mental disorders in clinics.

The results showed that, among all mental disorders, the prevalence of NSSI was highest in patients with personality disorders (46.7%). Borderline personality disorder often presents with comorbid NSSI[33]. In fact, in the DSM-5, NSSI is one of the diagnostic criteria for borderline personality disorder[34]. Among other major mental disorders, the prevalence of NSSI ranged from 0.5% to 46.7%, which is consistent with previous studies.

Ose et al. showed how widespread NSSI is in other mental disorders. For example, the prevalence in bipolar disorder, major depressive disorder, anxiety disorder, schizophrenia, schizoaffective disorder, adjustment disorder, eating disorder, substance use disorder, personality disorder and other mental disorders ranged from 7.0% to 14.4%[23]. The highest prevalence of NSSI in their study was for personality disorders (14.4%), although all types of personality disorders were grouped together. Ose et al. also proposed that the majority of subjects with personality disorders who exhibited NSSI behaviours in their study actually had borderline personality disorder[23]. In this study, the proportion of patients with borderline personality disorder out of all personality disorders reached 91.1% (41/45). Notably, the prevalence of NSSI was around 10% for both depressive disorders and bipolar and related disorders, and these two diagnoses were also the most common among all NSSI patients. This is also consistent with the study by Ose et al., which showed that, while the prevalence of NSSI was highest in patients with borderline personality disorder, the number of patients with an affective disorder who exhibited NSSI was highest[23]. This suggests that it would be unwise to focus only on NSSI in patients with borderline personality disorder in the clinic. We should pay attention to patients with other mental disorders as well, especially depressive disorders and bipolar and related disorders.

Limitations

The limitations of this study are mainly reflected in the following aspects. First, this study is a cross-sectional study, and recall bias and response bias may have had a certain influence on the results. Second, the subjects in this study were all patients with mental disorders who

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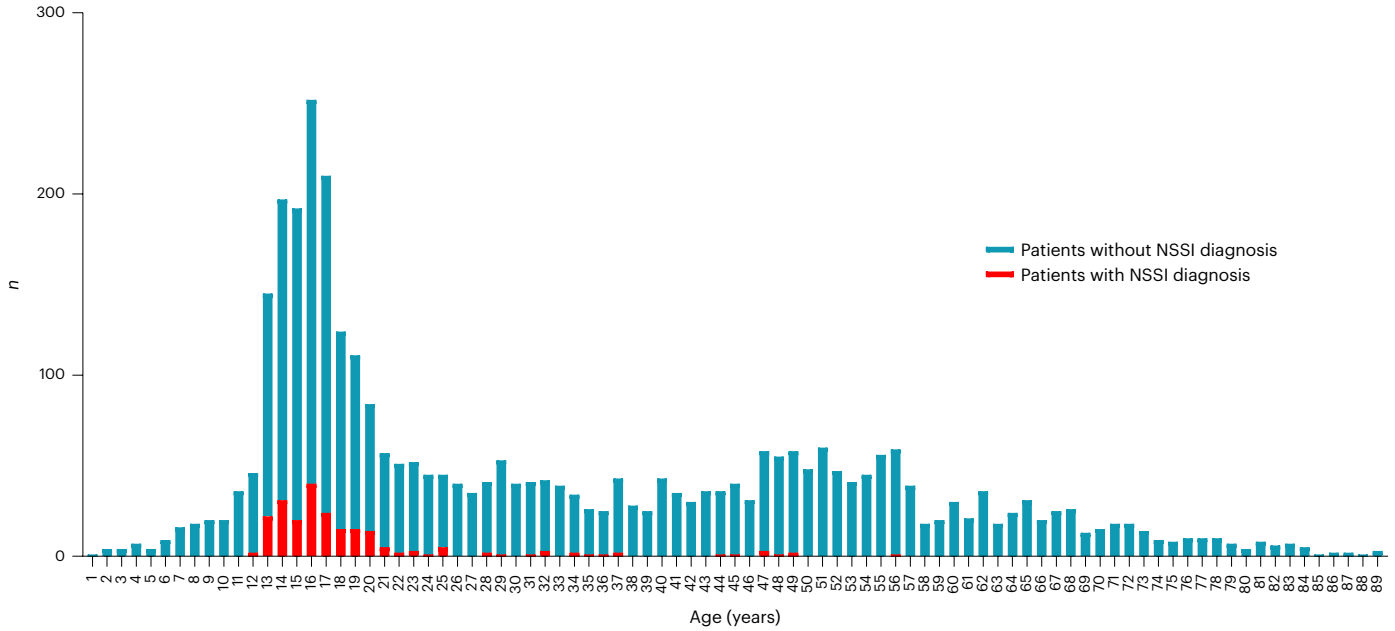

Fig. 1 | Distribution of patients with and without NSSI diagnosis in total population. The vertical axis is the number of people; the horizontal axis is age. The height of the bars indicates the total number at the given age.

Table 5 | Prevalence of NSSI diagnosis by age

Category	Number of patients without NSSI diagnosis (%)	Number of patients with NSSI diagnosis (%)	χ^2	*P* value
Age (years)				
0–9	83 (100.0)	0 (0)	187.461	0.000
10–19	998 (85.7)	166 (14.3)		
20–29	437 (93.0)	33 (7.0)		
30–39	322 (96.7)	11 (3.3)		
40–49	406 (98.1)	8 (1.9)		
50–59	429 (99.3)	3 (0.7)		
60 or over	402 (100.0)	0 (0)		

Chi-squared tests (two tailed, unadjusted) were conducted for the variables.

came to a hospital seeking treatment. Since not all patients with mental disorders seek treatment at a hospital, selection bias is inevitable. Third, the subjects were collected by successive sampling, which may have a limited value for the representativeness of the data. Fourth, we only use the main diagnosis of mental disorders, resulting in incomplete data, and the relevant data will be further improved in the future.

Conclusions

The results of this study show that NSSI is more common among adolescents and women in psychiatric departments. Also, NSSI occurs frequently in patients with personality disorders and in patients with other psychiatric disorders such as depressive disorders and bipolar and related disorders. Clinicians should be made aware of the prevalence of NSSI in these groups for prevention and early intervention.

Innovations

This is the first national multi-centre survey in China of NSSI in patients with mental disorders using the diagnostic criteria recommended by DSM-5. In addition, this study was not limited to the investigation of patients in a specific age group, as it was conducted to explore the prevalence of NSSI at each age level.

Future research prospects

Future studies should investigate NSSI on the basis of large-scale surveys of mental disorders to obtain more objective results. Behavioural characteristics, and causes and factors of behaviour could be explored, which may produce effective suggestions for the prevention and targeted treatment of NSSI. Understanding the motivation for NSSI and related influencing factors can play a role in prevention and enable clinicians to intervene early. At the same time, prevention and treatment for NSSI requires the joint efforts of society, family and medical institutions.

The results of this study reflect the occurrence of NSSI in patients with mental disorders in China. They can be used to inform mental health policy-making, planning and evaluation of NSSI in China. The results are conducive to promoting the development of NSSI-related study and contributing to the comparison of the prevalence of NSSI across countries.

Methods

Study design

A cross-sectional study was used to survey the epidemiology of NSSI behaviour in patients with mental disorders in China. A successive sampling method was used to select respondents. The research centre is located in Nanjing Brain Hospital, Nanjing, Jiangsu Province, with sub-centres including east and west China, In terms of the sub-centres for south and north China, in addition to the research centre in Jiangsu Province, one each of a specialist, a comprehensive, a district-level and a military hospital was selected. To match the east–west centre, five western cities were added as sub-centres. The 15 participating units are located in 14 cities of 8 provinces across the country.

Sample

For the cross-sectional successive sampling survey adopted in this study, the target sample size was determined by evaluating previous studies in China and abroad, especially the study of NSSI behaviour in patients with mental disorders, and referring to relevant research.

Twenty per cent was selected as the basic research background to determine the sample size, with a 95% confidence interval and 3% error rate, and the sample size was estimated by using the software PASS to calculate the sample content. The sample size needed for the survey was determined to be 2,798. Considering the number of participating hospitals and the number of outpatient visits and ward beds in each hospital, we decided to conduct a 2 week survey at each hospital to collect enough samples for the survey.

Participants

The participants were patients who met the DSM-5 diagnostic criteria for one or more mental disorders and for NSSI[35]. Patients who failed to meet the diagnostic criteria for any mental disorder or subjects with a neurological disease, a serious medical disease such as cancer, cardiovascular disease and so on, and pregnant or breast-feeding women were excluded.

Quality control

All the interviewers were psychiatrists who were uniformly trained in clinical and NSSI diagnosis before participating in the survey. They also received 2 h of training on the objectives and procedures of the survey. During the study process, there was a weekly quality control online meeting to check and solve problems in the scientific research process in a timely manner, to ensure that the research was carried out smoothly according to the quality and quantity requirements.

Ethical standards

The research was approved by the Ethical Committee of the Affiliated Brain Hospital of Nanjing Medical University (2019-KY043-01). Participants provided written informed consent (signed by family members for participants under the age of 18 years). Financial compensation was offered to participants for their time.

Procedures

A face-to-face interview was used to obtain information about the patients (outpatients and inpatients) from the 15 hospitals participating in this study. All outpatients of a general psychiatry department and adolescent general outpatient clinic (corresponding outpatient clinic) of psychiatrists with attending physicians in 15 participating units for 2 weeks were selected, and the physicians used semi-structured interviews. First, psychiatric diagnostic interviews were conducted following Mini International Neuropsychiatric Interview or DSM-5 criteria to determine whether all outpatients met the diagnosis of any mental disorder, with only main diagnoses being used. Second, those who met the diagnosis were asked whether they have NSSI behaviours. Preliminary screening was conducted to determine whether the diagnosis was in line with NSSI. Third, professionally trained psychology graduate students conducted a second interview to confirm the inclusion and exclusion criteria. Finally, basic information was collected, and the enrolled patients completed a questionnaire. Data were collected from 1 July to 31 August 2019. In the outpatient survey, patients who were discharged within the past 2 weeks were selected. In the inpatient survey, patients who had been admitted within the past 2 weeks were selected.

Statistical analysis

Statistical analysis was performed using SPSS (version 25.0), and the same sample was not measured repeatedly. Descriptive statistics were calculated for patient demographics. Differences in prevalence were analysed between NSSI and non-NSSI by using chi-squared tests and Wilcoxon rank sum tests (Mann–Whitney *U* test), respectively. The significance level was set at a *P* value threshold of 0.05.

Reporting summary

Further information on research design is available in the Nature Portfolio Reporting Summary linked to this article.

Data availability

The data sets generated and/or analysed during the current study are available from the corresponding author on reasonable request. The participants did not consent to the sharing of the raw data to the public. Source data are provided with this study. The databases used in this study include: https://www.cnki.net, https://www.wanfangdata.com.cn, https://pubmed.ncbi.nlm.nih.gov and https://www.webofscience.com.

Code availability

All code is available at https://www.ibm.com/docs/en/spss-statistics/25.0.0.

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Author contributions

Data curation and formal analysis were carried out by P.Z. L.O. wrote the original draft. M.L., Y.W., C.B., K.Y., Yuan Liu, J.L., X. Wang, G. Liu, X.J., Y.S., H.L., X. Wu, S.W., G. Li, B.Z., Yang Liu and J.H. carried out data collection. C.W. reviewed, edited and critically revised the paper. All authors read and approved the final paper.

Competing interests

The authors declare no competing interests.

Additional information

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Data sharing The data analysed during the current study are available from the corresponding author on reasonable request.

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Our web collection on statistics for biologists contains articles on many of the points above.

Software and code

Policy information about availability of computer code

Data collection	We used PASS (Version 15.0.5) software to determine the sample size of the study.
Data analysis	Statistical analysis was performed using SPSS (Version 25.0). Descriptive statistics were examined for patient demographics. Differences in prevalence were analyzed between NSSI and non-NSSI via Chi-squared tests. The significance level was set at p-value threshold of 0.05.

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The databases used in this study include: https://www.cnki.net, https://www.wanfangdata.com.cn, https://pubmed.ncbi.nlm.nih.gov, https://www.webofscience.com. The data that support the findings of this study are available upon reasonable request from the corresponding author. The participants did not consent to the sharing of the raw data to the public. Source data are provided with this study.

Human research participants

Policy information about studies involving human research participants and Sex and Gender in Research.

Reporting on sex and gender	The purpose of this study was to explore the detection rate of NSSI, so gender was not considered in the study design. The gender was determined based on self-reporting. Among the 3298 participants, 1405 (42.6%) were male and 1893 (57.4 %) were female. We consent has been obtained for sharing of individual-level data.
Population characteristics	A total of 3,298 patients with mental disorders ranging in age from 1 to 89 years were enrolled in the study, among the 3298 participants, 1405 were male (42.6%, mean age=31.4 years) , and 1893 were female (57.4 %, mean age=35.2 years) .
Recruitment	A face-to-face interview was used to obtain information about the patients (outpatient and inpatient) from the 15 hospitals participating in this study. Select all outpatient of a general psychiatry department and adolescent general outpatient clinic (corresponding outpatient clinic) of psychiatrists with attending physicians and above in 15 participating units for 2 weeks, and the physicians will use semi-structured interviews. First, conduct psychiatric diagnostic interviews through MINI or DSM-5 criteria to determine whether all outpatients meet the diagnosis of any mental disorder, only main diagnoses were used. second, those who meet the diagnosis are asked whether they have NSSI behaviors. Preliminary screening was conducted to determine whether the diagnosis was in line with NSSI. Third, professionally trained psychology graduate students who constituted the diagnosis conducted a second interview to confirm the inclusion and exclusion criteria, finally, the basic information was collected, and the enrolled patients completed a questionnaire. First, this study is a cross-sectional study, and recall bias and response bias may have had a certain influence on the results. Second, the subjects in this study were all patients with mental disorders who came to a hospital seeking treatment. Since not all patients with mental disorders seek treatment at a hospital, selection bias is inevitable. These are common problems that difficult to avoid for studies involving participants drawn from clinical samples. Our relatively large sample size partly alleviated this problem.
Ethics oversight	The survey was approved by the Ethical Committee of The Affiliated Brain Hospital of Nanjing Medical University (2019-KY043-01). Participants （Participants under the age of 18 were signed by their family members） provided their written informed consent.

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

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Behavioural & social sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	This study is a quantitative cross-sectional study.
Research sample	3,298 individuals were selected for the survey, among them, 1257（38.1%） of the subjects were from the east of China, 1173 （35.56% ） from the west, 722(21.89%) from the south, and 146(4.43%) from the north. Among them, 2380 were outpatients and 918 were inpatients. Among the 2380 outpatients, 982 (41.3%) were male and 1398 (58.7%) were female. Among the 918 inpatients, 423 (46.1%) were male and 495 (53.9%) were female. The research sample is representative. We observed an increasing incidence of NSSI behavior in patients with mental disorders in the clinic, so we chose these samples to investigate the occurrence of NSSI behavior in all age groups and people diagnosed with any mental disorder.
Sampling strategy	The sampling procedure was based on random and convenience. The cross-sectional successive sampling survey adopted in this study, the target sample size was determined by assuming that previous studies at China and abroad, especially the study of NSSI behavior in patients with mental disorders, were understood by referring to relevant research. It is planned to select 20.0% as the basic research background to determine the sample size of this study, take 95% confidence interval and 3% error rate, and estimate the sample size through the software PASS specially calculating the sample content. Finally, it was concluded that the sample size needed for the survey was 2798. Considering the number of participating hospitals as well as the number of outpatient visits and ward beds in each hospital, it was decided to conduct a two-week survey in each hospital in order to collect the number of samples needed for the survey.
Data collection	Pen and paper were used to record the data. The researcher was present besides the participants while they were completing the behavioral assessments. The researcher was blind to the study hypothesis during data collection.
Timing	Data were collected from July 1 to August 31, 2019

Data exclusions	When recruiting subjects, Patients who failed to meet the diagnostic criteria for any mental disorder or subjects who with neurological disease, serious medical disease such as cancer, cardiovascular disease, etc, and pregnant or breastfeeding women were excluded,there are no exact exclusions here. 3407 individuals were invited to participate in the survey, 109 patients were excluded because they were not officially diagnosed with a mental disorder. Among 3298 individuals, 3135 met at least one mental disorder diagnosis according to DSM-5, and 163 did not.
Non-participation	Among the 221 patients with an NSSI diagnosis, Demographic information was collected on 179 people, and 42 refused entry to the experiment.
Randomization	This study was a multi-center survey of NSSI behavior and did not involve randomization.

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

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☒	☐ ChIP-seq
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Clinical data

Policy information about clinical studies

All manuscripts should comply with the ICMJE guidelines for publication of clinical research and a completed CONSORT checklist must be included with all submissions.

Clinical trial registration	No clinical trial was performed.
Study protocol	The study protocol for obtaining the clinical samples was approved by the Ethical Committee of The Affiliated Brain Hospital of Nanjing Medical University (2019-KY043-01). Includes DSM-5 and Demographic Scales.
Data collection	The subjects were recruited from 15 hospitals in China(The specific hospital information is in Table 1) over a two-week period.
Outcomes	no pre-define of primary and secondary outcome.