

Research paper

Prevalence of and risk factors for non-suicidal self-injury in rural China: Results from a nationwide survey in China



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ABSTRACT

Background: Non-suicidal self-injury (NSSI) is a highly prevalent and serious public health problem among adolescents worldwide. However, to date there were no studies assessing the prevalence of NSSI defined by suggested DSM-5 criteria among Chinese adolescents. We aimed to conduct a nationwide survey to explore the prevalence of and risk factors for NSSI among school-based adolescents in rural China.

Methods: A total sample of 15,623 adolescents in rural China were enrolled by using a multistage sampling method. Data was collected by self-report questionnaires including demographic characteristics, neglect, maltreatment, loneliness, resilience, social support and emotional management ability. NSSI was defined by suggested DSM-5 criteria, according to which the engagement in self-injury took place more than 5 times a year. Multinomial logistic regression models were used to estimate the association between risk factors and NSSI.

Results: There were 12.2% of adolescents (n = 1908) met the suggested DSM-5 criteria. Approximately 29% reported a history of NSSI at least once during the last year. Significant differences were found in several demographic factors including gender, ethnicity, grade, and family structure between adolescents with and without experiencing NSSI. The top three NSSI behaviors among adolescents with NSSI experience were hitting self, pinching, and pulling hair, with a prevalence rate of 16.7%, 14.1% and 11.2%, respectively. Female, Han ethnicity, fathers' education level, neglect, maltreatment, loneliness, social support, suicidal behaviors and emotional management ability were significantly associated with NSSI by multivariate analysis. No significant relationship was found between resilience and risk of NSSI.

Limitation: The DSM-5 has proposed 6 groups of criteria for NSSI, we only used criteria on frequency given its more accepted feasibility and pragmatic application. Consequently, it may differ from other prevalence that estimated by other criteria.

Conclusion: To the best of our knowledge, this is the first study reporting prevalence of NSSI defined by suggested DSM-5 criteria among adolescent in rural China. In comparison to finding from the similar samples of adolescents, Chinese rural adolescents seem to have a relative higher prevalence. The potential risk factors for NSSI include female, father's education, Han ethnicity, psychosocial factors and suicide behaviors. More evidence for further understanding of context of the occurrence, improving access to health care utilization, and identifying the role of psychosocial factors and family relationship, is needed for the prevention and management of NSSI.

1. Introduction

Non-suicidal self-injury (NSSI) is generally defined as destruction of bodily tissues without suicidal intent and for not-socially-sanctioned

purposes, which is different from suicide in terms of intention, lethality and frequency (Guertin et al., 2001). The common forms of NSSI include hitting, cutting, burning, banging, and scratching, but usually exclude overdose and self-poisoning (Jessica and Marc, 2015). The

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onset of NSSI in community population is in early adolescent, with an approximate median age of 13 or 14 years (Muehlenkamp et al., 2012). In 2013, NSSI has been included in section III under conditions that 'need further study' in the Fifth Edition of Diagnostic and Statistical Manual of Mental Disorders (DSM-5), and six groups (Group A, B, C, D, E, F) of criteria were proposed (American Psychiatric Association, 2013).

The epidemiology of NSSI have been extensively studied in some western countries in their nationwide longitudinal studies (Plener et al., 2015; Tuisku et al., 2014; Christoffersen et al., 2015). Self-reported lifetime history of NSSI ranged from 7% to 66% among adolescents, which depending on the definition of NSSI and the assessment tools used (Somer et al., 2015; Zetterqvist et al., 2013a; Tang et al., 2016). Yet in China, evidences for the prevalence of NSSI remains sparse and heterogeneous in some studies with small sample sizes (Zhang et al., 2016; Wan et al., 2015). Moreover, some previous studies involved clinical populations, which could not distinguish NSSI behaviors between participants with and without suicidal intent, or used inconsistent criteria to define NSSI (You et al., 2012a; Wong et al., 2007). Evidences from well-designed studies with large sample size are needed to help better understand the epidemiology of NSSI in general adolescents in China.

Adolescent NSSI is becoming a serious public health concern worldwide (Grandclerc et al., 2016). Previous studies have shown that NSSI is associated with a variety of co-morbid difficulties and inclined to develop into a severe symptomatology, although it is not lethality or low lethality (Scott et al., 2015; Tang et al., 2013). For example, a prospective cohort study conducted in England showed that the risk of suicide was 0.7% over the next year among adolescents who engaged in NSSI, which was about 66 times more than the general adolescents. And the risk of suicide increased to 1.7%, 2.4% and 3% over the next 5 years, 10 years and 15 years, respectively (Hawton et al., 2015). Other studies also showed that NSSI increased the risk of suicidal ideation, suicidal attempts and other mental disorders (Paul et al., 2015; Jeremy et al., 2016). The latest report even stated that self-injury is the eight leading cause of death in the United States (Rockett et al., 2015). Thus, it is urgent to investigate the risk factors and develop preventive measures for NSSI.

Based on Nock's integrated theoretical model of NSSI, the risk factors were extensively, which may cover the health system, community and individual level (Abebaw et al., 2016). Aspect for health system, health literacy and the availability of health care (Zhang et al., 2016; Goldney and Fisher, 2008) have been reported associated with NSSI. For example, Zhang et al. have reported that low health literacy and psychological symptoms potentially increase the risk of NSSI in Chinese middle school students (Zhang et al., 2016). Aspect for community level, child abuse, stigma, discrimination, school bullying also have been reported to associate with NSSI (Swannell et al., 2016; Fisher et al., 2012; Lang and Sharma-Patel, 2011). As one of the functions of NSSI was emotional regulation, psychological traits and psychological process were deemed as the most direct factors of NSSI (Halina et al., 2015). Low mood, insecure peer attachment, self-esteem, depression, impulsivity, aggression etc. have been reported associated with NSSI (Andrews et al., 2013; Bjarehed et al., 2012; Marshall et al., 2013). However, due to methodological issues, the associations between above factors and NSSI have not always drawn consistent conclusion, sometimes even a contradictory conclusion (Stallard et al. 2013; You et al. 2012b).

In this study, we aimed to conduct a nationwide survey to estimate the prevalence of NSSI defined in compliance with suggested DSM-5 criteria (Group A: the engagement in self-injury took place more than 5 times a year without suicidal intent) and to explore associations for NSSI among school-based adolescents in rural China. We hypothesized that there will be a relative higher prevalence of NSSI among the participants compared to prior data, and NSSI may be associated with neglect, maltreatment, loneliness, social support, emotional ability, resilience, even after taking into account some potential variables.

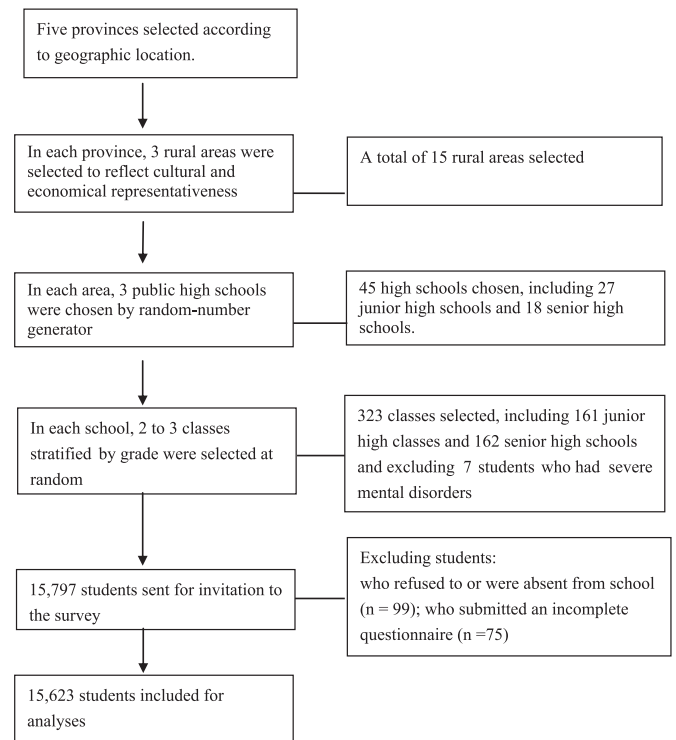


Fig. 1. The flow diagram presenting the selection of study subjects.

2. Methods

2.1. Participants and settings

This study based on a nationwide survey among grade 7–12 students in public high schools in rural China. We used a similar sampling method that conducted in our previous study (Zhang et al., 2012), to generate a diverse sample (see Fig. 1). First, we selected five representative provinces according to geographic locations: Heilongjiang (northern), Anhui (eastern), Guangdong (southern), Yunnan (Western) and Hubei (central), in which a total of fifteen rural areas were sampled to reflect cultural and economic representativeness (Socioeconomic Investigation Division of the National Bureau of Statistics of China, 2008). Then, from all public high schools in these areas, a total sample of 45 schools was randomly chosen using random-number generator, including 27 junior high schools and 18 senior high schools. All participating schools provided consent to enroll in this study. Third, in the selected schools, we also use random digits to select 2–3 classes stratified by grade. All the students in the selected classes were recruited. Because students with severe mental disorders may fail to understand the purposes and contents of the survey, we excluded 7 students who were reported to have severe mental disorders (including 2 schizophrenia, 3 paranoid psychosis, 2 bipolar disorder) by the head teacher and/or the school health care doctor. Finally, written informed consents were sent to a total of 15,797 students or their guardians from a list of 323 classes to ask for their participation. There were 99 students who refused to participate or absent from school on the day of survey, and 75 who submitted an incomplete questionnaire with missing data of > 15%. In the end, there were 15,623 students with age range from 12 to 18 years old included for analyses, leading to a response rate of 98.9% (15,623/15,797).

This survey was conducted from 2014 to 2015 by a group of trained and experienced teachers and postgraduates. Before the survey, all students were informed of the purpose and procedures of the study in detail. The anonymous questionnaire survey required about 30–35 minutes for completeness. All participants finished the

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