



The 6-item Kessler psychological distress scale to survey serious mental illness among Chinese undergraduates: Psychometric properties and prevalence estimate

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Abstract

Objective: To evaluate the psychometric properties of the 6-item Kessler psychological distress scale (K6) in screening for serious mental illness (SMI) among undergraduates in a major comprehensive university in China.

Method: The K6 was self-completed by 8289 randomly sampled participants. A group of them ($n = 222$) were re-assessed using K6 and interviewed using the Chinese version of Composite International Diagnostic Interview 3.1 (CIDI-3.1).

Results: The test–retest reliability of the K6 scale was 0.79, the Cronbach's alpha was 0.84, and its area under the receiver operating curve (AUC) for diagnosing CIDI-3.1 SMI was 0.85 (95% CI = 0.80–0.90). For the optimal cut-off of K6 (12/13), the sensitivity (SEN), specificity (SPE), positive predictive value (PPV), negative predictive value (NPV), and classification accuracy (AC) were 0.83, 0.79, 0.60, 0.93, and 0.80, respectively. The 12-month prevalence of SMI was estimated as 3.97% using this optimal cut-off. Binary logistic regression analysis (including gender, ethnicity, grade, number of siblings and family residency location) showed that only family residency location in rural areas compared to urban areas was significantly associated with more SMI.

Conclusions: This study documented the value of using the K6 for detecting SMI in Chinese undergraduate populations and supported its cross-cultural reliability and validity.

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1. Introduction

Chinese people have tended to view university students as 'favored by heaven' and being less vulnerable to mental distress or disorders. With the rapid growth of universities and colleges accompanying the great socio-economic transition, however, mental health problems of university students have received unprecedented attention in recent decades in China [1]. Previous mental health surveys which

mostly used self-reported dimensional scales such as 90-Symptom Checklist (SCL-90), Self-Rating Anxiety Scale, and Self-Rating Depression Scale have suggested high prevalences of mental health problems (10%–30%) including anxiety, phobia, obsessive and/or compulsive, and depression symptoms or syndromes among Chinese college students [2–4]. Recent surveys using structured diagnostic interviews by clinicians further highlighted the high prevalences of mental health problems among Chinese university students. For example, Chen et al. [5] found that the current prevalence of depressive symptoms and major depressive disorder (MDD) were 11.7% and 4.0% respectively among university students in Harbin. Kou et al. [6] found that the lifetime, 12-month and 30-day prevalences of neurotic disorders were 25.6%, 15.7% and 6.8% respectively

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among the Changchun university students. These estimates were comparable to or even higher than the highest prevalences of comparable disorders (e.g., 2.1% for 30-day MDD and 5.6% for 30-day anxiety disorders) found in the recent Chinese community-based adult studies [7].

In view of this pressing problem, many Chinese universities have established mental health support programs on campus [8,9]. Due to the vigorous extension of these support programs and limited availability of caregivers, however, the need for mental health service estimated by aforementioned surveys is overwhelming [10]. Actually, many “cases” detected by aforementioned community level surveys may not require professional treatment [11]. What is more, the financial and human resources for carrying out structured diagnostic interviews and/or long dimensional scales such as SCL-90 are limited for most circumstances but the best-funded epidemiology studies [12]. Therefore, the need for developing a simpler and more efficient strategy which can rapidly capture the smaller portion of students with clinically significant serious mental illness (SMI) is increasingly recognized [11]. Indeed, the importance of SMI has been increasingly recognized by health policy makers and psychiatric epidemiologists around the world. In the United States (US), Public Law (PL) 102-321 has stipulated the definition of SMI, under which a person has at least one 12-month DSM disorder, other than a substance use disorder, and “serious impairment” [13]. In China, recently, the Mental Health Law (published on October 26, 2012 and effective from May 1, 2013) has further suggested the importance of study on SMI by proposing a conception of severe mental disorders (SMD) which defined similarly to SMI in the US PL 102-321 and includes mental disorders characterized by severe symptoms that result in serious impairment in social adaptation or other types of functioning, impaired awareness of objective reality or of one’s medical condition, or an inability to deal with one’s own affairs [14].

To screen for SMI quickly and accurately, a number of instruments, including 6-item Kessler psychological distress scale (K6), the 10-item Kessler psychological distress scale (K10), the Composite International Diagnostic Interview Short Form, and the World Health Organization Disability Assessment Schedule, had been compared in a study [13]. Among them, the K6, which was initially designed as a screening scale to monitor population prevalences of and trends in non-specific psychological distress [15], was identified as the most promising one due to its brevity and efficacy. Since then the K6 has been validated and used as a screening tool for SMI in psychiatric epidemiological studies worldwide including China [16–21].

Above studies notwithstanding, there is a general lack of surveys on the psychological properties of K6 and prevalence of SMI among Chinese university students. Therefore, the present study carried out a two-stage cross-sectional epidemiological survey with a view to evaluating the psychometric properties of the K6 and investigating the prevalence and sociodemographic correlates of SMI in a major Chinese comprehensive university.

2. Materials and methods

This two-stage cross-sectional survey was performed in a national comprehensive university located in southwestern China. Its undergraduates come from across the country. The study was approved by the ethics committee of Sichuan University, and written-informed consent was obtained from each participant of this study.

2.1. Sampling

There were 41228 undergraduates in the University, in order to get a representative sample, we using a multistage stratified cluster sampling method. We randomly chose 192 classes from 4 grades in 28 colleges. All undergraduates in each randomly-sampled class were invited to participate in this study. The proportion of classes sampled from each college depended on its proportion of student number in the university. Finally, a total of 8837 undergraduates were invited. Of these, 8289 undergraduates signed the informed consent letters and participated in the first stage of this study, which resulted in an overall effective response rate of 93.80%.

In the second stage, participants were recruited from the respondents of the first stage using a stratified method as follows: In the first stage, participants were asked to leave their telephone numbers if they were interested in the participation of a face-to-face interview regarding their mental health conditions, and 4050 participants responded positively. Among them, 887 participants scored 8 or above on the K6, and 3163 participants scored 7 or below. As some studies reported that respondents who scored 8 or above on the K6 were more likely to have SMI [12], we planned to invite all participants scored 8 or above to participate in the second stage survey and contacted them via telephone call with a maximum of five attempts. Among them, 529 (59.64%) did not answer the phone or hung up immediately, 261 (29.43%) initially agreed to participate, and 97 (10.94%) declined. In line with one previous study [20], a higher proportion of screened positives than negatives for the interview are needed when less than 50% of respondents screen positive. Therefore, we followed a typical 2:1 section rule to maximize statistical power, and randomly invited 450 subjects among participants who scored 7 or below. Among them, 232 (51.56%) did not answer the phone or hung up immediately, 156 (34.67%) agreed to participate, and 62 (13.78) rejected. In total, 417 first-stage participants initially agreed to participate in the second stage survey, but only 222 of them (148 of these participants scored 8 or above on the K6 in the first stage survey) showed up and completed the K6 and interview of the second stage survey. Therefore, of the undergraduates who were successfully contacted by telephone in the second stage, the cooperation rate was 38.54% ($222/[417 + 97 + 62] \times 100\%$).

2.2. Instruments

The K6, Patient Health Questionnaire (PHQ)-15, and a questionnaire about suicide ideation, plan and attempt were included in the self-report questionnaire that was administered in

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