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Sexual attraction and the nonmedical use of opioids and sedative drugs among Chinese adolescents

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ABSTRACT

Objective: The nonmedical use of prescription drugs (NMUPD) is attracting public attention. We aimed to explore the association between sexual attraction and NMUPD among Chinese adolescents.
Method: A school-based survey was conducted in seven Chinese provinces, and a multi-stage stratified cluster sampling method was used in this study. A total of 150,822 students from seven Chinese provinces completed the questionnaire; the response rate was 95.93%. All data were collected between November 2014 and January 2015.
Results: Overall, 8.8%, 4.4%, and 2.2% of the students reported lifetime, past-year, and past-month NMUPD, respectively. Compared with heterosexual students (8.2%), sexual minority and unsure students were more likely to report lifetime NMUPD (14.4% and 10.0%, respectively; χ^2 = 244.34, P < 0.001). In addition, sexual minority and unsure students were more likely to admit past-year and past-month use of NMUPD. After adjusting for social demographics and lifestyle covariates, sexual minority and unsure students were at an increased risk of lifetime NMUPD (adjusted odds ratio [AOR] = 1.68, 95% confidence interval [CI] = 1.54-1.83 and AOR = 1.33, 95% CI = 1.26-1.41, respectively).
Conclusions: Our study suggested that sexual minority and unsure adolescents have a higher risk of NMUPD. Moreover, our study suggested that sexual minority and unsure students are more likely to both try and continue to use prescription drugs. Further studies focusing on the mechanism of substance abuse and appropriate interventions among sexual minority and unsure adolescents are warranted.

1. Introduction

In the past few decades, sexual minority mental health disparities have been recognized as a global public health problem. It has been well demonstrated that sexual minority adolescents are more likely to report substance abuse (Goldberg et al., 2013; Homma et al., 2012). A *meta*-analysis revealed a higher prevalence of substance use among sexual minority adolescents than among their heterosexual peers (OR = 2.89) (Marshal et al., 2008). Moreover, previous studies reported that sexual minority adolescents were more likely to report cigarette (Corliss et al., 2012), alcohol (Ziyadeh et al., 2007), and illegal drug use (Hatzenbuehler et al., 2015). Recently, concern about the nonmedical use of prescription drugs (NMUPD) among adolescents has been increased due to the availability and popularity of these drugs.

NMUPD is defined as prescription drug use without a prescription solely for the feeling or experience caused by the drug (Guo et al., 2015; Wang et al., 2015). According to the 2016 Monitor the Future survey, the prevalence of lifetime, annual, and 30-day misuse of prescription drugs among U.S. 12th-grade students was 18.0%, 12.0%, and 5.4%, respectively (Johnston et al., 2017). Previous studies conducted among Chinese adolescents revealed that 4.8%-11.3% of students reported lifetime NMUPD (Guo et al., 2015; Wang et al., 2014; Wang et al., 2015). Opioids and sedatives were two of the most prevalent prescription drugs among Chinese adolescents (Wang et al., 2014; Wang et al., 2015). Compared with illegal drugs, prescription drugs are more easily obtained from peers and family (McCabe and Boyd, 2005) and can be misperceived as safer (Fleary et al., 2013), which makes drug use prevalent among young people. However, prescription drugs can be as addictive as other illegal drugs and can lead to physiological and psychological dependence (McCabe et al., 2007). NMUPD increases the

risk of negative mental health outcomes, such as anxiety (Gros et al., 2013), depression (Zullig and Divin, 2012), and suicide (Guo et al., 2016), and it is also associated with other forms of substance abuse, including cigarette, alcohol, and other illegal drug use (Jayawardene and Youssefagha, 2014).

Previous studies reported a higher prevalence of NMUPD among sexual minorities (Cochran et al., 2004). A Youth Risk Behavior Survey conducted in the U.S. reported that 27.5% of sexual minority students had ever taken prescription drugs without a prescription (Kann et al., 2016). A longitudinal study among U.S. adolescents revealed that lesbian/gay and bisexual adolescents were at a higher risk of misuse of prescription drugs (RR = 3.16 and RR = 3.97, respectively) (Corliss et al., 2010). Kecojevic et al., (2012) found that the initiation of prescription drug misuse (e.g., opioids and tranquilizers) began at an earlier age in lesbian, gay, bisexual, and transgender (LGBT) youth than in their heterosexual peers (Kecojevic et al., 2012).

Adolescents who report unsure sexual orientation may suffer from sexual minority stress as well, such as bullying and discrimination (Birkett et al., 2014), which can cause mental health problems (Coulter et al., 2016; Corliss et al., 2014; Kann et al., 2016; Zhao et al., 2010). However, some previous studies did not include adolescents who were unsure of their sexual orientation in the analysis (Corliss et al., 2010; Homma et al., 2012), and some studies did not provide the option of unsure sexual orientation (Goldberg et al., 2013; Kecojevic et al., 2012). Only a few studies have investigated substance abuse among the unsure group (Kann et al., 2016).

A higher risk of NMUPD among sexual minority adolescents has been demonstrated in Western countries. The patterns of the association between sexual minority status and some mental health disparities (such as depression, suicide (Lian et al., 2015), and smoking (Zhang et al., 2017)) found in Chinese sexual minority adolescents were similar to those in Western countries. However, only a small amount of data is available concerning the association between sexual orientation and NMUPD among Chinese adolescents.

In the present study, we used data from the 2015 School-based Chinese Adolescents Health Survey (SCAHS) (1) to estimate the prevalence of NMUPD in sexual minority and unsure adolescents and (2) to examine the association between sexual attraction and NMUPD among adolescents.

2. Methods

2.1. Participants and procedures

SCAHS is an ongoing, large-scale, cross-sectional study of health-related behaviors, including NMUPD, among 7th- to 12th-grade Chinese adolescents (Guo et al., 2015; Wang et al., 2014; Wang et al., 2015). Since 2007, SCAHS has been conducted every two years. The latest version, the 2015 survey, was conducted in seven Chinese provinces. A multi-stage stratified cluster sampling method was utilized in the present study. All 34 province-level regions in China were divided into three strata according to economic level. Two or three provinces were selected randomly in each stratum. The seven provinces were Guangdong, Liaoning, Shandong, Hunan, Shanxi, Chongqing, and Guizhou. In each province, cities were divided into three strata according to economic level, and two cities were selected in each stratum. All eligible schools in each city were stratified according to the type (junior high school, senior high school, and vocational school) and size of the school. In each city, 6–7 junior high schools, 4–5 senior high schools, and 2–3 vocational schools were selected randomly. In each school, two classes were selected randomly from each grade. All of the students in these classes were invited to participate in the study. Finally, 150,822 students completed the questionnaire (reached sample N = 157,217; response rate 95.93%). Each student completed a self-administered questionnaire with the help of trained interviewers. To protect the privacy of the students, the questionnaire was completed

anonymously and in the absence of a teacher. If a student requested question clarification, the interviewer encouraged the student to answer according to their own understanding of the question. When students returned the questionnaires, the interviewers did not review any questions. All the data were collected between November 2014 and January 2015.

2.2. Ethics statement

The study protocol was approved by the Institutional Review Board of Sun Yat-sen University, School of Public Health. Each school and the students' parents provided informed consent before the students participated in this study.

2.3. Measures

2.3.1. Sexual attraction

In this study, sexual orientation was measured by asking students the following question related to sexual attraction (Lesbian, Gay, and Bisexual (LGB) Youth Sexual Orientation Measurement Work Group, 2003): "In a romantic relationship, which type of person are you attracted to?" The response options included "opposite sex", "same sex", "both opposite and same sex", and "unsure". Students who responded "same sex" or "both opposite and same sex" were classified as sexual minorities.

2.3.2. Nonmedical use of prescription drugs

In this study, NMUPD was measured by asking whether the students had experienced nonmedical use of opioids, sedatives, or any of the prescription drugs listed below. The list of medications was provided by the Center for Adverse Drug Reaction (ADR) Monitoring of Guangdong and included medicines reported to be widely used by adolescent drug abusers in rehabilitation centers. In this study, opioids included compound licorice tablets (opium), cough syrup with codeine (codeine), diphenoxylate, and tramadol hydrochloride. Sedatives included diazepam (benzodiazepines), triazolam (benzodiazepines), scopolamine hydrobromide tablets (barbiturates), and compound aminopyrine phenacetin tablets (barbiturates). Lifetime, past-year, and past-month NMUPD were assessed in this study. NMUPD was assessed by asking the following question: "Have you ever used the following medications, even once, when you were not sick or just for the purpose of experimenting or getting high without a doctor's prescription?" The question was followed by the list of prescription drugs mentioned above, and the response options for each drug were either "yes" or "no". If the response was "yes", past-year NMUPD was assessed, and the students who reported past-year NMUPD were further asked about past-month NMUPD. The students who reported lifetime NMUPD were also asked about the main source of prescription drugs and their motivation for NMUPD. The main source of prescription drugs for nonmedical use was assessed by asking the following question: "Where did you usually get the above-mentioned drugs for nonmedical use? (choose one option that is most suitable for your situation)". The response options for this question were 1) family, 2) peer, 3) pharmacy, 4) hospital, 5) entertainment venues (such as nightclub, bar, and disco), and 6) others. The main motivation for NMUPD was assessed by asking the following question: "Why did you nonmedically use the abovementioned drugs? (choose one option that is most suitable for your situation)". The response options for this question were 1) curiosity, 2) sensation seeking, 3) influenced by family or peer, 4) to relieve stress, and 5) others.

2.3.3. Covariates

Covariates that have previously been reported to be associated with NMUPD, including social demographics, lifestyle, interpersonal relationship (Guo et al., 2015; Wang et al., 2014; Wang et al., 2015), smoking (Kelly et al., 2015) and alcohol use (Messina et al., 2014), were also considered and adjusted in a logistic regression analysis. Social