



Research paper

Association between childhood maltreatment and non-medical prescription opioid use among Chinese senior high school students: The moderating role of gender



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ARTICLE INFO

Keywords:

Non-medical prescription opioid use
Childhood maltreatment
Gender
Moderating effect

ABSTRACT

Background: Non-medical prescription opioid use (NMPOU) and childhood maltreatment are currently serious problems among adolescents worldwide, and childhood maltreatment may be associated with the increased rates of NMPOU. This study examined the specific associations between particular types of childhood maltreatment and lifetime NMPOU and assessed whether gender has a moderating effect on these associations.

Methods: A 3-stage, stratified cluster, randomized sampling method was used to collect data from 11,194 high school students in Chongqing.

Result: The prevalence of the lifetime NMPOU among senior high school students in Chongqing was 7.7%. Physical abuse (AOR = 1.11, 95% CI = 1.07–1.14), emotional abuse (AOR = 1.05, 95% CI = 1.03–1.08), sexual abuse (AOR = 1.04, 95% CI = 1.01–1.07), physical neglect (AOR = 1.06, 95% CI = 1.04–1.09), and emotional neglect (AOR = 1.03, 95% CI = 1.02–1.04) were all positively associated with lifetime NMPOU. The moderating effects of gender on emotional abuse ($P = 0.004$) and sexual abuse ($P = 0.019$) were statistically significant in the adjusted model of lifetime NMPOU. According to the stratification analyses in which the male and female students were analyzed separately, female students who previously experienced emotional/sexual abuse had a higher prevalence of lifetime NMPOU.

Limitations: The study sample only contained school students and cross-sectional design limited our ability to make causal inferences.

Conclusion: Childhood maltreatment was positively associated with lifetime NMPOU, and gender had a moderating effect on the associations between childhood maltreatment and lifetime NMPOU. Early identification of and intervention for childhood maltreatment victims, particularly female victims, may help reduce the lifetime risk of NMPOU.

1. Introduction

The non-medical use of prescription drugs (NMUPD), including pain medications/opioids, sedatives, tranquilizers and stimulants, has been a topic of great concern (Novak et al., 2011). According to the 2015 report of the National Survey on Drug Use and Health (NSDUH), 492,000 American adolescents aged 12–17 years reported NMUPD in the previous month, and prescription drugs have become the second most popular type of drugs among adolescents (Bose, 2016). Notably, nonmedical prescription opioid use (NMPOU) has become the most

prevalent type of prescription drug abuse among adolescents, and it is associated with an increased risk of several adverse health outcomes, such as risky sexual behavior (Buttram et al., 2014), heroin use (Mateu-Gelabert et al., 2015), and a higher rate of fatalities (Okie, 2010). According to the 2014 NSDUH report, 7.3% of adolescents (aged 12–17) have engaged in NMPOU during their lifetime (Hedden et al., 2015); our previous study also demonstrated that the prevalence of lifetime NMPOU was 11.3% among Chinese adolescents (Guo et al., 2015). NMPOU has become a growing public problem (Sung et al., 2005; Whiteside et al., 2013), and Chinese adolescents are no exception.

Abbreviations: NMUPD, non-medical use of prescription drugs; NMPOU, non-medical prescription opioid use

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<https://doi.org/10.1016/j.jad.2018.04.070>

Received 12 October 2017; Received in revised form 16 March 2018; Accepted 7 April 2018

Available online 10 April 2018

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Childhood maltreatment has been shown to be associated with lifetime NMPOU (Heffernan et al., 2000; Mills et al., 2005). Childhood maltreatment includes sexual abuse and all forms of physical and emotional ill-treatment and neglect and results in actual or potential harm to a child's health, survival, development or dignity in the context of a relationship of responsibility, trust or power (World Health Organization, 2006). Childhood maltreatment is a global issue affecting more than two billion children worldwide, the majority of which live in low- and middle-income countries (Korbin et al., 2014). In China, childhood maltreatment is a common experience for children and is associated with huge financial losses because many maltreated children suffer psychological distress and might adopt unhealthy behaviors that increase the risk of chronic diseases (Fang et al., 2015). In the general population, a history of childhood maltreatment is associated with a higher prevalence of illicit substance use disorders (Conroy et al., 2009; Molnar et al., 2001). According to a nationally representative study conducted in the U.S., adolescents in grades 7 through 12 who experienced childhood maltreatment were 3.44 times more likely to have abused illicit substances in the previous 30 days (Diaz et al., 2002).

Several studies have begun to propose that gender may play an important role in the association between childhood maltreatment and NMPOU, improving our understanding of the specific nature of the association (Kristmanvalente and Wells, 2013; Meng and D'Arcy, 2016). For example, some studies have indicated that the association between childhood maltreatment and NMPOU may differ by gender, suggesting a stronger association among women (Simpson and Miller, 2002; Widom et al., 2006). Bartholomew et al. (Conroy et al., 2009) suggested that opioid-dependent women were significantly more likely to report childhood sexual abuse than opioid-dependent men.

However, most previous studies investigating the association between childhood maltreatment and NMPOU were conducted in Western or developed countries, and very few have been conducted in developing countries, such as China. It is well known that the cultural background of Western countries is different from that of Asian countries, especially China, where Confucianism has been an influence for thousands of years and parental authority and children's obedience is emphasized (Doom et al., 2013). Therefore, we conducted this large-scale cross-sectional study among Chinese adolescents to comprehensively examine the associations between different types of childhood maltreatment and NMPOU, with a particular focus on gender differences.

2. Methods

2.1. Study design and participants

This study was conducted using data from the School-based Chinese Adolescents Health Survey (SCAHS), which has been performed every two years since 2007 (Tang et al., 2016; Wang et al., 2014). We obtained a subsample of the survey responses collected in Chongqing between 2014 and 2015. The participants were senior high school students from Chongqing. The study sample was selected using a multistage, stratified cluster-randomized sampling method. In stage 1, we divided the entire city into three levels based on the Gross Domestic Product (GDP: high, medium and low). Then, we randomly selected two counties from each level. In stage 2, we randomly selected six high schools from each county. In stage 3, two classes were randomly selected from each grade (grade 10–12) at the selected schools, and all available students in the classes were surveyed. Finally, 11,194 senior high school students were invited to participate, and 10,904 questionnaires completed by the students were eligible for the study. The response rate was 97.4%. To protect the students' privacy, the anonymity of the self-reported questionnaires was guaranteed. The questionnaires were completed by the students during a normal class period (45 min). To avoid any potential information bias, the research assistants administered the survey in the classroom without teachers present.

2.2. Ethical statement

The study received approval by the Sun Yat-Sen University School of Public Health Institutional Review Board. After the study procedures had been fully explained, written informed consent was obtained from the school and each participating student who was at least 18 years of age. If a student was under 18 years of age, written informed consent was obtained from one of the student's parents (or legal guardian).

3. Measures

3.1. Lifetime NMPOU

Lifetime NMPOU was assessed by the following question: "Have you ever used the following list of prescription opioid drugs even once not to treat an illness but for the feeling or experience caused by the drug without a doctor's prescription?". The responses were coded as 0 = No and 1 = Yes. The prescription opioid drugs on the list included cough syrup compounded with codeine (codeine), compounded licorice tablets (opium), tramadol hydrochloride, and diphenoxylate. The lifetime NMPOU prevalence calculation included any use of a drug on the list (i.e., use of at least one category at least once). The list of prescription opioid drugs was developed based on a list provided by the Center for ADR Monitoring of Chongqing and medicines reported to be widely used by adolescent drug abusers in local rehabilitation centers.

3.2. Childhood maltreatment

The short form of the Childhood Trauma Questionnaire (The CTQ-SF) (Bernstein et al., 1994, 2003) in Chinese was used to assess the history of childhood maltreatment. The CTQ-SF contains five clinical subscales that assess different types of childhood maltreatment (i.e., physical abuse, emotional abuse, sexual abuse, physical neglect and emotional neglect).

The CTQ-SF scales are based on the following definitions of abuse and neglect. Sexual abuse is defined as "sexual contact or conduct between a child younger than 18 years of age and an adult or older person". Physical abuse is defined as "bodily assaults on a child by an adult or older person that posed a risk of or resulted in injury". Emotional abuse is defined as "verbal assaults on a child's sense of worth or well-being or any humiliating or demeaning behavior directed toward a child by an adult or older person". Physical neglect is defined as "the failure of caretakers to provide for a child's basic physical needs, including food, shelter, clothing, safety, and health care" (poor parental supervision was also included in this definition if the children's safety was jeopardized). Emotional neglect is defined as "the failure of caretakers to meet children's basic emotional and psychological needs, including love, belonging, nurturance, and support".

Each subscale of the CTQ-SF is based on five questions about childhood experiences that provide adequate reliability and content coverage, and the answers are rated on a 5-point scale as follows: never, rarely, sometimes, often and very often. Each of the 5 CTQ-SF subscale scores range from 5 to 25, with higher scores indicating more severe childhood maltreatment.

3.3. Covariates

Factors that have been reported to be associated with child maltreatment or the non-medical use of opioid use were considered (Han et al., 2015; Manchikanti and Singh, 2008). The demographic variables included age, gender, grade, living arrangements, household socioeconomic status (HSS), parental marital status, academic pressure, classmate relationships, relationships with teachers, current smoking status, and current alcohol use. The living arrangements were assessed by asking the participants to list the individuals living in their primary home (responses were coded as "living with both parents", "living with

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