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How clients' during-treatment motivations relate to their perceptions and impressions of methadone maintenance treatment: A multilevel analysis of a cross-sectional survey in Guangdong Province, China

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ABSTRACT

Background: Much evidence has suggested the positive effect of methadone maintenance treatment (MMT) on mitigating adverse outcomes caused by opioid use. Pretreatment motivations are associated with clients' engagement, retention, and outcomes in drug use treatment. However, motivation is mutable, and few MMT researchers have considered during-treatment motivations and associated multilevel factors.
Objective: We aimed to investigate during-treatment motivations and clinic- and individual-level associated factors among MMT clients in Guangdong Province, China. Methods: Stratified random sampling was used to select 12 MMT clinics in Guangdong Province. Between December 2011 and January 2012, a total of 802 respondents were surveyed about their motivation and multilevel factors using the following instruments: the Texas Christian University (TCU) Treatment Motivation Scales, the impression-of-detoxification scale, the National MMT Data Management System of China, and structured questionnaires. Multilevel models were employed to conduct the univariate and multivariate analyses of the factors associated with during-treatment motivations for MMT.
Results: The means ± SD (95% CI) of clients' during-treatment motivations (Desire for Help and Treatment Readiness) were 2.89 ± 0.56 (2.85, 2.93) and 2.28 ± 0.57 (2.24, 2.32). Multilevel analyses showed that clients' educational level, perceptions, and impressions of MMT; and clinics' supportive family assistance and closing time were significantly associated with during-treatment motivations for MMT ($P < 0.05$).
Conclusions: During-treatment motivation may play a significant role in the success of MMT. There is a need for improving motivation among Chinese MMT clients, and the knowledge of associated factors may guide more effective program in the future.

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1. Introduction

Opioid dependence is a public health problem accounting for a variety of major health and social consequences (UNODC, 2014). In 2010, approximately 43,000 deaths were attributed to opioid dependence globally (Degenhardt et al., 2013). Opioid dependence has also been proved to be associated with criminal activities, high-risk behaviors, and transmission of blood-borne diseases (Hammersley et al., 1989; Risdahl et al., 1998). By the end of 2014, about 1.46 million Chinese abused opiate drugs, making up 49.3% of the 2.96 million registered drug addicts (registered by public security organs if drug users were found, seized, or in rehabilitation; NDCC, 2015). In addition, among Chinese injection drug users (IDUs) and non-IDUs, HIV prevalence rates were 12.6% and 1.1%, respectively, and HCV prevalence rates were 67.0% and 18.3%, respectively (Bao and Liu, 2009), suggesting a critical challenge of tackling opioid-related comorbidities in China.

Methadone maintenance treatment (MMT) programs have been developed and implemented as a way to reduce morbidities and mortalities associated with opioid use (WHO, 2009). China introduced MMT programs in 2004 (Yin et al., 2010) and further expanded them to 766 clinics across 28 provinces, serving more than 410,000 drug users by 2014 (Cao and Li, 2015). Nonetheless, MMT programs in China still face many challenges, such as relapse

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in drug use and suboptimal adherence (Sullivan et al., 2013; Zhou and Zhuang, 2014). A study showed that 24.6% of Chinese clients remained positive from urine opiate tests 12 months after MMT enrollment. Compared to other countries, China also demonstrates lower MMT 1-year retention rates (55.2% vs. 60.0–85.0%); Zhang et al., 2013).

For many drug use programs (e.g., MMT), pretreatment motivation is a crucial predictor of clients' participation (Neff and Zule, 2002), engagement (Hiller et al., 2002; Zule and Desmond, 2000), retention (De Leon and Jainchill, 1986; De Leon et al., 1997; Kelly et al., 2011; Simpson and Joe, 1993), and treatment outcomes (Simpson et al., 1997). Studies also suggest that factors at various levels, such as gender (Webster et al., 2011), race/ethnicity, pregnancy (Mitchell et al., 2009), drug use, addiction treatment experiences, physical or mental health (Nwakeze et al., 2002) etc., may impact pretreatment motivation. Most previous MMT-related studies merely focused on the assessment of pretreatment motivation. However, during-treatment motivations were rarely studied, which is likely to be mutable during the treatment process as a result of service quality, treatment length, and other potential multilevel factors. Moreover, there is a scarcity of research on the relationship between clients' during-treatment motivations and their perceptions or impressions of MMT, which are also important predictors of treatment retention (Kayman et al., 2011) and heroin use outcomes (Gossop et al., 2003).

In order to address these research gaps, we conducted a study to investigate clients' during-treatment motivation status and associated clinic- and individual-level factors, especially their duration, perceptions, and impressions of MMT, at methadone clinics in Guangdong Province, China.

2. Material and methods

2.1. Study site

Located in southern China, Guangdong Province had more than 457,000 registered drug addicts, nearly one-sixth of those in China (Zhang, 2014), and 61 MMT clinics have been established by 2014 (GDHFPC, 2014). The study was conducted in 2011, and 12 MMT clinics were selected by stratified random sampling. Previous evidence showed that pretreatment motivations were significantly associated with clients' retention. Hence, we conjectured that client's during-treatment motivation might relate to clinic 1-year retention rate, which was most commonly used to describe MMT retention situation and the data of which was available from our unpublished early results. Imbalanced sampling may cause bias, such as less accurate estimation of motivation, so we used the median of clinic 1-year retention rates as the cut-off to divide the clinics from the sampling frame into 2 strata; then, 6 clinics were randomly selected from each stratum.

This study has been approved by the Sun Yat-sen University Ethics Committee ([2013] Ref. No. 26).

2.2. Participants

Participants who were in treatment at the selected clinics were eligible to participate in this study if meeting the followed the inclusion criteria: (a) several failed attempts to quit heroin use and addiction assessed based on a diagnosis of drug dependence according to the Chinese Classification of Mental Disorders 3 (CCMD-3), (b) being at least 20 years old (HIV-positive clients did not need to meet this condition), (c) registration as a local resident (*hukou*) in the area where the clinic was located, (d) having a full capacity for civil conduct, and (e) willingness to participate in the research and sign the informed consent (Sullivan et al., 2015). The exclusion criteria were: (1) having open pulmonary tuberculosis, (2) having severe cognitive impairment, communication problems, or a writing disorder, and (3) being evaluated by investigators and being considered that their questionnaires were unqualified.

A convenient sample of participants at each clinic was recruited, that is, clients who came to the selected clinics to drink methadone during the investigation were recruited and checked whether they met the inclusion or exclusion criteria. A total of 802 participants were recruited for the research from 12 MMT clinics in Guangdong Province, China. The number of clients from each selected clinic varied from 24 to 103.

2.3. Data collection and measurements

All research data were collected between December, 2011 and January, 2012. Twelve directors of MMT clinics were interviewed face to face by trained researchers with a clinic-level structured questionnaire; and 802 clients were surveyed using a self-administered structured questionnaire. Both questionnaires were printed and filled in by pen. In addition, demographics and MMT-related information were abstracted from a national MMT data management system, with authorization.

2.4. Clinic-level independent variables

Clinic-level variables were collected by inviting the directors from 12 MMT clinics to complete a structured interview questionnaire about clinic information, including the code of the clinic; its location, opening time, and closing time; the mean dose of methadone; psychological intervention; supportive group activities; supportive family assistance; antiretroviral therapy (ART) or referral; presence of the police arresting addicts around; the number of services provided by clinic; the number of healthcare workers (defined as nurses and physicians employed (Xia et al., 2013a,b)); and the number of clients receiving treatment (Table 2).

2.5. Individual-level independent variables

First, demographics were abstracted from the Chinese National MMT Data Management System, such as the code of the clinic (used for connecting to clinic-level variables), gender, date of birth (converted to age), employment status, ethnicity, marital status, education, the date of the first methadone prescription (converted to the duration of treatment), MMT enrollment experiences in the past, whether the patient was enrolled in MMT at the current clinic, the result of latest urine opiate test (a positive result meaning continued illicit drug use), and HIV infection status.

Second, clients' perceptions of MMT were evaluated by 3 qualitative questions: (a) What do you think of methadone? (b) What do you think of MMT healthcare workers? (c) What do you think of the MMT clinic? Responses were summarized and categorized based on prior evidence, expert opinions, and qualitative research as described by Xia et al. (2013a).

Third, clients' impressions of MMT were examined by the impression-of-detoxification scale (IDS) from the *Evaluation of Psychoactive Substance Use Disorder Treatment Workbook Series*, which consisted of 18 five-point Likert items (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always, and 0 if not applicable) (WHO, 2000). Compared with qualitative questions about perceptions that underline clients' opinions and attitudes toward methadone, MMT healthcare workers, and clinics, IDS focuses more on feelings and impressions of MMT overall (how I feel during treatment) through the aggregate scores of the following items: the staff tried to understand my problems, the detox was comfortable, the type of help I was looking for was provided, etc. The Chinese version of IDS was established and modified through the process of parallel transla-

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