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Perceived Barriers to Post-release Participation in Methadone Maintenance Treatment: Perspectives of Compulsory Drug Detoxification Center Detainees in Yunnan, China

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Perceived Barriers to Post-release Participation in Methadone Maintenance Treatment: Perspectives of Compulsory Drug Detoxification Center Detainees in Yunnan, China

A dissertation submitted in partial satisfaction of the

requirements for the degree of Doctor of Philosophy

in Epidemiology

by

Julie Jwuyun Hsieh

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ABSTRACT OF THE DISSERTATION

Perceived Barriers to Post-release Participation in Methadone Maintenance Treatment: Perspectives of Compulsory Drug Detoxification Center Detainees in Yunnan, China

by

Julie Jwuyun Hsieh

Doctor of Philosophy in Epidemiology

University of California, Los Angeles 2013

Professor Roger Detels, Chair

Background: The Chinese Methadone Maintenance Treatment (MMT) Program was established in 2004 and has expanded rapidly to 28 provinces, autonomous regions, and municipalities with a total of 738 MMT clinics providing treatment for a cumulative total of more than 344,000 patients at the end of 2011. However, the total number of patients being treated daily accounted for less than 20% of all registered opiate users not counting the unregistered drug-using population. Coverage of the community-based MMT program is still low and the dropout rate among MMT patients remains high. The primary objective of this study is to identify barriers associated with detainees' unwillingness to participate in community-based MMT when released from compulsory drug detoxification centers in China.

Methods: This study was carried out in two compulsory drug detoxification centers in Mangshi City, Dehong Prefecture, Yunnan Province. Between July and November, 2012, in-depth interviews were conducted with 20 incarcerated drug users in one center. A total of 250

incarcerated drug users was also recruited to participate in a face-to-face cross-sectional survey using a convenient sampling method in the other center.

Results: The majority of our study participants expressed their unwillingness to initiate MMT enrollment post-release, which is of great concern. Most participants' reasons for unwillingness to take part were: no perceived needs to participate in MMT; misconceptions and lack of MMT-related knowledge; limited accessibility and financial difficulties. Moreover, side-effects, inconvenience, dosage and concurrent opiate and stimulant uses were indicated as reasons for dropping out. We also documented that ethnic disparities existed in this culturally and geographically diverse population. Lastly, a surprisingly high proportion of our study participants reported using stimulants, specifically ephedrine, as their primary drug of choice.

Conclusions: There is an urgent need to revamp the current practices inside the compulsory drug detoxification and rehabilitation centers as well as the community-based MMT programs in China. A comprehensive Pre-release Relapse Prevention Program needs to be established to prepare those soon-to-be released detainees for life after incarceration. The community-based MMT program needs to be expanded to include psychological counseling and behavioral modification in order to retain patients and prevent high dropouts. In addition, testing for non-opiate drugs as part of the urine-monitoring program at MMT clinics needs to be implemented. Ethnic disparities need to be considered when designing future educational campaigns and prevention programs. And educational materials regarding the danger of stimulants addiction should be developed and disseminated among drug users and the general public as soon as possible. Further training on drug addiction as a chronic disease and methadone related knowledge should be provided for compulsory drug detoxification and rehabilitation center staff. Cooperation between public security and health sectors also needs to be strengthened.

The dissertation of Julie Jwuyun Hsieh is approved.

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To all who suffer from drug dependence, especially those who participated in this study

and

To dedicated staff who labor in the field to combat drug abuse and alleviate suffering

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ANOVA	Analysis of Variance
CDC	Center for Disease Control and Prevention
HAART	Highly Active Antiretroviral Therapy
HIV	Human Immunodeficiency Virus
HCV	Hepatitis C Virus
IDU	Injecting Drug Users
MMT	Methadone Maintenance Treatment
PLWHA	People Living With HIV/AIDS
STD	Sexually Transmitted Diseases
USD	United States Dollar

CHAPTER I

Introduction

HIV/AIDS in China

Human Immunodeficiency Virus (HIV) infection and Acquired Immunodeficiency Syndrome (AIDS) have become a worldwide pandemic in the last three decades and continue to pose one of the greatest challenges to global public health. Despite great efforts to curb the disease from spreading and increased access to highly active antiretroviral treatments (HAART), an estimated 34.0 million [31.6 – 35.2 million] people were still living with the virus in 2010 including 2.7 million [2.4 – 2.9 million] newly infected cases (UNAIDS, 2011). While the Sub-Saharan region remains most affected by the disease, countries such as Russia, India, and China have reported a steady increase of new infections and added concerns for expanding epidemics in these regions.

China's first HIV case was reported in 1985 in a foreign traveler who subsequently died in Beijing (Zhang & Ma, 2002). From 1985 to 1988, a limited number of sporadic cases was reported between foreign and overseas Chinese travelers and these cases were mostly imported (Wang, 2007). The first domestic outbreak occurred in 1989 when 146 injecting drug users (IDUs) tested positive for HIV in Ruili city, Dehong prefecture, Yunnan province, which is adjacent to Southeast Asia's Golden Triangle region bordering Myanmar, Laos, and Vietnam (Cheng et al., 1997; Zhang et al., 1999). This event marked the beginning of an epidemic driven by injecting drug use. From 1989 to 1993, the epidemic among IDUs took off and spread to the major drug trafficking routes of Guangxi, Xinjiang, Sichuan, Guangdong, Guizhou, and other nearby provinces (China Ministry of Health and NCAIDS, 2001). Another epidemic driven by

commercial plasma donors also occurred in rural communities of Central China from 1994 to 1998 (Liu et al., 2001; Wu et al., 2004). This epidemic was caused by contamination during plasma collection and pooling of blood cells before return to donors. Subsequently, sexual transmission became the main driving force of the epidemic as spouses of infected injecting drug users and former commercial plasma donors got infected, and female commercial sex workers became infected. In addition, the epidemic among men who have sex with men also occurred in the 2000s and spread disease further through sexual transmission. Vertical transmission among a small subset of newborns infected by their HIV-positive mothers was also reported (Wang, 2007).

By 1998, HIV infections had reached all 31 provinces, autonomous regions, and municipalities and the phase of exponential growth of the epidemic began (Zhang & Ma, 2002). As of the end of 2011, an estimated 780,000 [620,000 – 940,000] people were living with HIV/AIDS (PLWHA) in China, of whom, 28.6% were women; the overall prevalence was approximately 0.058% [0.046 – 0.070%] (China Ministry of Health, Joint UN Program on HIV/AIDS, & World Health Organization, 2011). Although the prevalence of HIV is relatively low in China, its large population and the rapid spread of infections from various high-risk groups to the general population is alarming. In 2011, there were approximately 48,000 [41,000 – 54,000] new HIV infections and 28,000 [25,000 – 31,000] AIDS-related deaths. Of those PLWHA in China, 46.5% acquired HIV through heterosexual transmission and 17.4% through male-to-male sexual transmission. An estimated 28.4% was infected through injecting drug use with 87.2% occurring in six provinces and autonomous regions (Yunnan, Xinjiang, Guangxi, Guangdong, Sichuan, and Guizhou). Former commercial plasma donors and recipients of contaminated blood or blood products accounted for an estimated 6.6% of all infections and were

concentrated in four provinces (Henan, Anhui, Hubei, and Shanxi). Lastly, mother-to-child transmission accounted for 1.1% of the total estimated PLWHA population (China Ministry of Health, Joint UN Program on HIV/AIDS, & World Health Organization, 2011).

Although unsafe injecting practices among drug users have been the largest contributor to the early HIV/AIDS epidemic in China, sexual transmission has taken over as the dominant route since 2007 (Figure 1.1). The proportion of cases via sexual transmission increased from 33.1% in 2006 to 76.3% in 2011 and the proportion arising from male-to-male transmission increased from 2.5% in 2006 to 13.7% in 2011. According to recent national sentinel surveillance data, the overall HIV prevalence among IDUs is about 6%, which remains the highest among all risk groups (China Ministry of Health, 2012).

Yang and Xia (2010) reported a recent phenomenon of new types of drug abuse that includes methamphetamine (*Bingdu*), Ketamine (*K fen*), and Ecstasy/MDMA (*Yaotou Wan*) taken orally via pill form or as an inhalant compared to the more traditionally injectable drugs. These drugs are quickly replacing heroin and opium to become the most widespread illicit drugs used in China (Wang, 2007). There are severe consequences; in particular, these new types of drugs often stimulate sexual activity, contribute to risky sexual practices, and result in higher risk of acquiring HIV and other sexually transmitted infections (Colfax and Guzman, 2006). As a result, non-injecting drug users may have contributed to the increase of HIV cases via sexual transmission. It is clear that the Chinese HIV/AIDS epidemic is constantly evolving and new prevention strategies need to be developed to combat rapid changes.

Illicit Drug Use in China

Illicit opiates have a long history of use in China and can be traced back to the late Qing Dynasty. When the British colonized most of the Asia/Pacific region in the 1800s, they brought

opium along with them to exchange for Chinese silk and tea. As a result, opium has been grown locally ever since. When the Communist party founded the People's Republic of China in 1949, about 5% of the Chinese population was addicted to opium (McCoy et al., 2001). In the 1950s, the Communist government led by Chairman Mao carried out a successful national anti-drug campaign to eliminate illicit drug abuse and declared victory and China was considered a drug-free country for the next 30 years (Chen et al., 2006). However, as China switched to a market economy and adopted an "open-door" policy in the 1980s, problems associated with drug abuse re-emerged at rocket speed (United Nations Office on Drugs and Crime, 2003).

Heroin is still the most popular illicit drug of choice in China and favored by 85% of all drug users (Sullivan & Wu, 2007) although there has been an increase in stimulant-type of drug abuse in the last few years (Lu, Fang, & Wang, 2008). In addition, opium (both in its natural and synthesized [kaku] forms) is also popular along the major drug trafficking routes. Currently, the majority of heroin comes from Myanmar into Yunnan province and/or from Vietnam into Guangxi province before heading to other parts of China along the drug trafficking route (Beyrer et al., 2000). According to the World Drug Report in 2008, China had the third largest heroin seizures in the world (United Nations Office on Drugs and Crime, 2008). Heroin abusers often started using through sniffing or snorting (Li et al., 2002) before switching to injecting for both economical and dosage reasons. According to the National Behavioral Surveillance Data in 2004, 49% of heroin users administered through injection and 43% shared needles (China Ministry of Health and UN Theme Group on HIV/AIDS in China, 2004).

In 1990, the Chinese Ministry of Public Security began registering drug users to gain a better understanding of the increasing prevalence of opiate use. Initially, 148,000 drug users were registered and the number climbed quickly to 681,000 in 1999, revealing more people using

illicit drugs (National Police Head Quarters of China, 2000). In 2009, the official number of registered drug users was around 1.27 million but the actual number of illicit drug users is estimated to have reached 3.5 million (Chen et al., 2006; Kulsudjarit, 2004; Chu & Levy, 2005; Yin et al., 2010). Some researchers estimated that the actual number of drug users in China could be six times greater than the official record (Chen et al., 2006).

Illicit opiate users have long been considered the largest contributors to China's HIV epidemic since the first outbreak was reported in Ruili, Yunnan in 1989. Heroin users are predominantly young (under 30), single (over 60%), and male (60-70%) with low education and no steady jobs (Zheng et al., 1994; Liu, Lian, & Zhao, 2006). Sharing needles and injection equipment are common practices (Qian et al., 2006). In addition, heroin users also engage in risky sexual behaviors that put them and their sexual partners at increased risk for HIV infection (Sullivan & Wu, 2007).

Compulsory Drug Detoxification and Rehabilitation Treatment in China

Illicit drug use is illegal in China and the government has a long history of advocating a punitive approach toward drug users. Compulsory detoxification has been used as one of the main means of illicit drug control in China and operated mainly under the auspices of the Public Security system (Sullivan & Wu, 2007). In addition, voluntary detoxification centers were also established by the Health sector and housed mostly inside psychiatric hospitals. These voluntary detoxification centers often used a pharmacological agent such as methadone to foster initial withdrawal symptoms before the addicts were completely drug free and treatment in these centers was frequently short-termed. In 1990, the "Regulations on Prohibition Against Narcotics" stated that illicit drug users arrested by the public security system would be registered and placed in compulsory detoxification centers from one to six months or fined up to 2000 yuan

for the first offense. Those with repeated arrests would be detained in compulsory rehabilitation facilities formerly known as "re-education through labor" centers from one to three years according to the severity of their drug addiction and other illegal conduct (National People's Congress of China, 1990; Sullivan & Wu, 2007).

According to a study in 2004, there were about 700 compulsory and 200 voluntary detoxification centers in China (Zhao et al., 2004). Chinese official statistics in 2009 stated more than one million drug users were registered, about 260,000 had been placed in compulsory treatment centers by law enforcement for rehabilitation and approximately 60,000 drug-related crimes had been recorded by police (China's Annual Report on Drugs, 2009).

Information on rehabilitation activities at these facilities is scarce. The only publicly documented knowledge is that most residential rehabilitation facilities require some form of physical exercise, anti-narcotics education, and vocational activities such as farming to promote abstinence; however, very few offer psychosocial counseling (Wang, 1999; Tang, 2001). The major detoxification methods used in these centers include pharmacological therapy for opioid addiction and traditional Chinese medicine. The agents used in this therapy are methadone, buprenorphine, clonidine, and lofexidine (Zhao et al., 2004). However, treatment provided in detoxification centers is mainly to ameliorate withdrawal symptoms and often limited to the duration of withdrawal (Cao & Liu, 2002).

Despite all these efforts by the government, the estimated abstinence rate three years post discharge is only 15% (Tang et al., 2006). Previous studies have shown that compulsory detoxification in China has been ineffective in reducing drug use (Liu et al., 2006). The relapse rate among drug users upon release is as high as 80 to 95% and many continue in the vicious cycle of drug abuse and compulsory detoxification facilities (McCoy et al., 2001; Cao & Liu,

2002). Multiple studies have also found that forced labor and punitive approaches are not effective in combating drug dependence (Wang, 1999).

Community-based Methadone Maintenance Treatment Program in China

Ever since Dole and Nyswander proposed using methadone as an opioid substitution therapy for heroin addiction in 1965 in the United States, methadone maintenance therapy (MMT) has been used extensively for opiate addicts because of its safe, convenient and effective qualities to combat opioid dependence. There is abundant evidence supporting methadone maintenance therapy as an effective treatment in reducing opiate and other illicit drug use, criminal activity, risk of overdose, HIV-related risk behaviors and improving health and social wellbeing (Ball & Ross, 1991; Marsch, 1998; Darke et al., 2000; Sorensen & Copeland, 2000; Godfrey et al., 2004; Gowing et al., 2008).

Acknowledging the efficacy of methadone maintenance therapy for the treatment of heroin addiction and subsequent reduction of HIV risky behaviors, the Chinese government took a groundbreaking step in 2004 and authorized the rapid establishment of community-based MMT programs throughout the country to reduce HIV transmission (Wu, 2005). Between March and June 2004, the first eight pilot clinics were set up in Yunnan, Guizhou, Sichuan, Zhejing and Guangxi provinces where the dual epidemics of drug use and HIV were most severe (Wu et al., 2007). An evaluation of patient information at 3, 6 and 12 months has show significant reduction in heroin use, and drug-related crime, and increase in employment and healthy family relationship among those successfully enrolled in MMT programs (Pang et al., 2007).

According to China's Action Plan for Reducing and Preventing the Spread of HIV/AIDS (2006-2010), every city and county with more than 500 registered opiate addicts should have established a MMT clinic to serve more than 40% of eligible IDUs (State Council of China,

2006) and MMT has been incorporated into the AIDS regulation as a treatment for opiate addiction (Wu et al., 2007). By the end of 2011, 623 counties and districts within 28 provinces, autonomous regions, and municipalities had established a total of 738 MMT clinics, providing treatment for a cumulative total of more than 344,000 patients. The total number of patients receiving daily treatment was 140,000 and an average of 190 patients was receiving treatment in each clinic. The treatment adherence rate was 74.9%. According to initial estimates, HIV incidence among patients on treatment fell from 0.54% in 2009 to 0.31% in 2011 (Ministry of Health, People's Republic of China, 2012).

The Chinese Ministry of Health, the Ministry of Public Security, and the State Food and Drug Administration (2006) collaboratively formed the National Methadone Working Group to devise a guideline for the community-based MMT program for opiate addicts and mandated that MMT clinics could only be operated as non-profit medical facilities. The National Methadone Working Group has overall responsibility for administration, planning, evaluation and monitoring, as well as producing and supplying the methadone and training the clinic staff.

Initially, the inclusion criteria for patients to participate in MMT required: (1) several failed attempts to quit the use of heroin, (2) at least two terms in a detoxification center, (3) age at least 20 years, (4) being a registered local resident of the area in which the clinic is located for at least 6 months or hold a temporary resident certificate, and (5) being a good civil character. Those testing positive or already HIV-positive would only need to fulfill criteria 4 and 5. These five inclusion requirements were relaxed recently to encourage greater access and increase coverage. For example, potential patients are no longer required to have local residency or a previous history of internment in a detoxification center. The treatment costs 10 yuan (approximately USD 1.61) for the daily dosage. However, some clinics in parts of China only

charge 5 yuan and as little as 2 yuan in order to compete with cheap heroin price in the region. Urine test for illicit opiate drug use is routinely required. Guideline for dosage follows international standards and patients take a daily oral dose of methadone under the supervision of clinic staff. Services offered at MMT clinics have been broadened to provide access to other services, including HIV and hepatitis testing, HAART for eligible AIDS patients, group activities, counseling and peer support (Ministry of Health, Ministry of Public Security, & State Food and Drug Administration, 2010).

Research Questions and Aims

The newly established MMT program signals that the Chinese government understands the critical link between drug abuse and control of HIV/AIDS and is moving away from a punitive approach to dealing with drug users. However, the program still faces many challenges. First of all, despite a high number of registered drug users nationwide, the number of drug users enrolled in the MMT program is relatively low. One study conducted in 2007 in Dehong, Yunnan reported only 6.28% coverage among all registered drug users in the region (Xing et al., 2012). Secondly, the patient dropout rate is high across all MMT clinics and concurrent drug use is common (Lin et al., 2010; Yin et al., 2010). Lastly, there is a high relapse rate among drug users released from compulsory detoxification and rehabilitation treatment yet very few voluntarily participate in the MMT program.

Understanding factors associated with these challenging issues will provide key data to strengthen the MMT program and allow policy makers to determine how to best facilitate transition from compulsory drug detoxification treatment to community-based MMT programs. This study was designed to identify barriers to participate or re-enroll in community-based MMT programs among post-released compulsory detoxification treatment detainees. Characteristics

observed in this study population may provide insights to future intervention/education programs. Specific objectives included: (1) identifying barriers to participation in community-based MMT programs among post released incarcerated drug users; (2) determining the needs and gaps in services for opiate users of various ethnic groups in order to optimize support programs; (3) documenting the current state of drug using behaviors and types of drugs abused among incarcerated drug users.

Study Site

This study was conducted in Mangshi City, Dehong Prefecture of Yunnan Province (Figure 2). Yunnan is located in Southwestern China and is part of the Mekong Sub-region, bordering Myanmar in the West and Laos and Vietnam in the South. The geographic proximity to the "Golden Triangle," the heart of heroin production in Southeast Asia, is a major contributing factor to the high prevalence of IDUs and HIV/AIDS in Yunnan (Deng et al., 2007). Dehong Prefecture, located at the most western part of Yunnan Province, has been an HIV epidemic area for the past two decades with 24.4% HIV-positives among drug users and around 40% HIV-positives among injecting drug users. In the early 1990s, the first Chinese HIV outbreak among IDUs was observed among the ethnic minorities in Ruili city of Dehong Prefecture (Zhang & Ma, 2002).

Dehong Prefecture, which is also known as Dehong Dai and Jingpo Autonomous Prefecture, consists of three counties and two county level cities: Lianghe County, Yingjiang County, Longchuan County; Mangshi City and Ruili City and has a population of approximately 1.2 million. Approximately 51.83% of the total populations are ethnic minorities, mostly Dai and Jingpo, who account for 71% of drug addicts in the region (Yunnan Province Population Census Office, 2002). Since the onset of the economic reforms in the late 1970s, the number of drug

addicts has increased sharply due to the open-door policies towards neighboring countries. As of 2012, Dehong Prefecture has a total of five MMT clinics and several compulsory drug detoxification detention centers.

Mangshi City is the capital city of Dehong Prefecture and the actual study site. It has one city-center, five towns, and five townships, and one ethnic township. The total population is approximately 343,000 with farmers accounting for 77.48%. There is one MMT clinic located in the city-center inside Mangshi City Center for Disease Control and Prevention and two extension sites/satellite clinics located at the township hospitals of Zhefang and Hula. The city has one Compulsory Drug Detoxification Center that houses those with HIV/AIDS, other severe illness, and those not fit to engage in intensive manual labor. This Center also serves as a transition/detention place for criminal and drug offenders before they are sentenced to other compulsory facilities. In addition, the Sixth Yunnan Provincial Isolated Compulsory Drug Detoxification Center is also located in Mangshi City and houses mostly residents of Mangshi City and other residents of the Dehong Prefecture.

Materials and Methods

This study utilized a mixed-method approach using a qualitative study in phase one followed by a quantitative study in phase two.

Qualitative Study

The first phase used in-depth interviews to assess characteristics of drug users residing in a compulsory detoxification treatment. The objective was to identify their barriers to MMT participation post-release. In addition, those with a previous history of MMT enrollment were assessed for their reasons to drop out of MMT service. Information obtained was then used to help design a questionnaire for the second phase of the study.

A total of twenty detainees was recruited by referrals from the healthcare staff inside the Mangshi City Compulsory Drug Detoxification Center. Study participants were of different ages, marital status, educational levels, and had different severity and history of drug addiction to maximize heterogeneity. The selection criteria were: (1) ages 18 or older; (2) reported a history of drug addiction; and (3) eligible to participate in community-based MMT per Chinese government's criteria. Those with serious medical and mental illness that might hamper their understanding of the study purpose or those who could not provide voluntary informed consent were excluded from the study.

All participation in the study was voluntary and took about 1-1.5 hours in a private room of the clinic inside the compulsory detoxification center. Face-to-face interviews were all conducted by the principal investigator, and informed consent was obtained before each interview. The interviews were semi-structured and used a guide with open-ended questions to elicit information. All interviews were audio-taped with the permission of the participants. Each participant received a toiletry bag equivalent to the value of 20 yuan (approximately USD 3.17) as compensation. In-depth interviews with drug users explored their socio-demographics, arrest history, drug use history, knowledge of the MMT program as well as their perceived barriers to participation. Recorded interviews were transcribed word-for-word into a Microsoft Word processor and imported into ATLAS. ti (v. 6.0), a qualitative data analysis software for analysis.

Analyses were performed by identifying themes occurring most frequently and focused on those related to barriers to MMT participation. The preliminary coding system containing key concepts and categories was developed based on interview guides. Revisions were made using transcripts with newly identified topics and factors. Any discrepancies were carefully examined and resolved until no new topics emerged to suggest a need for further revisions. All

transcriptions, coding, and analyses were completed in Chinese and the final results were later translated into English.

Quantitative Study

Phase two was a quantitative study using a cross-sectional design surveying those residing in the Sixth Yunnan Provincial Isolated Compulsory Drug Detoxification Center. The total sample size was 250. Selection was based on convenience and being a resident of Mangshi city. Additional selection criteria included being at least 18 years old, having a reported history of drug addiction, and ability to provide informed consent.

An anonymous face-to-face interview was carried out with each participant in a private area of the detention center. The structured questionnaire assessed participants' socio-demographic characteristics, drug use history, experience with voluntary and compulsory detoxification, knowledge of MMT, HIV, and HCV and willingness to participate in MMT post-release. Upon completion of the survey, each participant received a toiletry bag valued at 20 yuan (approximately USD 3.17) as compensation. Data collected were independently double-entered into Microsoft Office EXCEL and analyzed using IBM-SPSS (v. 20).

Detailed information regarding study design, methods, and results is described in the following chapters.

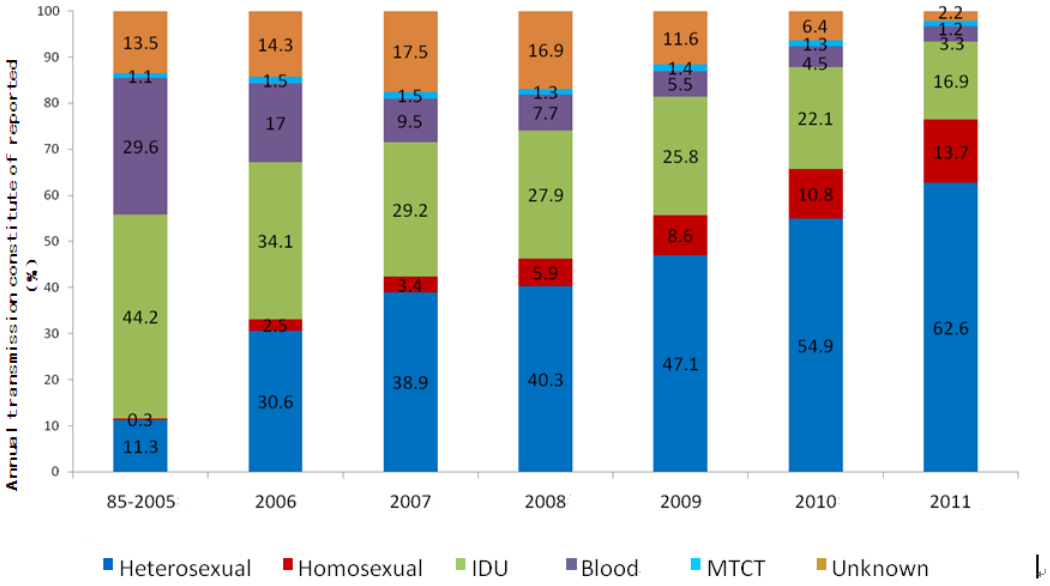

Figure 1.1 Annual reported HIV cases by transmission routes in China, 1985-2011 (source: China Ministry of Health, 2012)

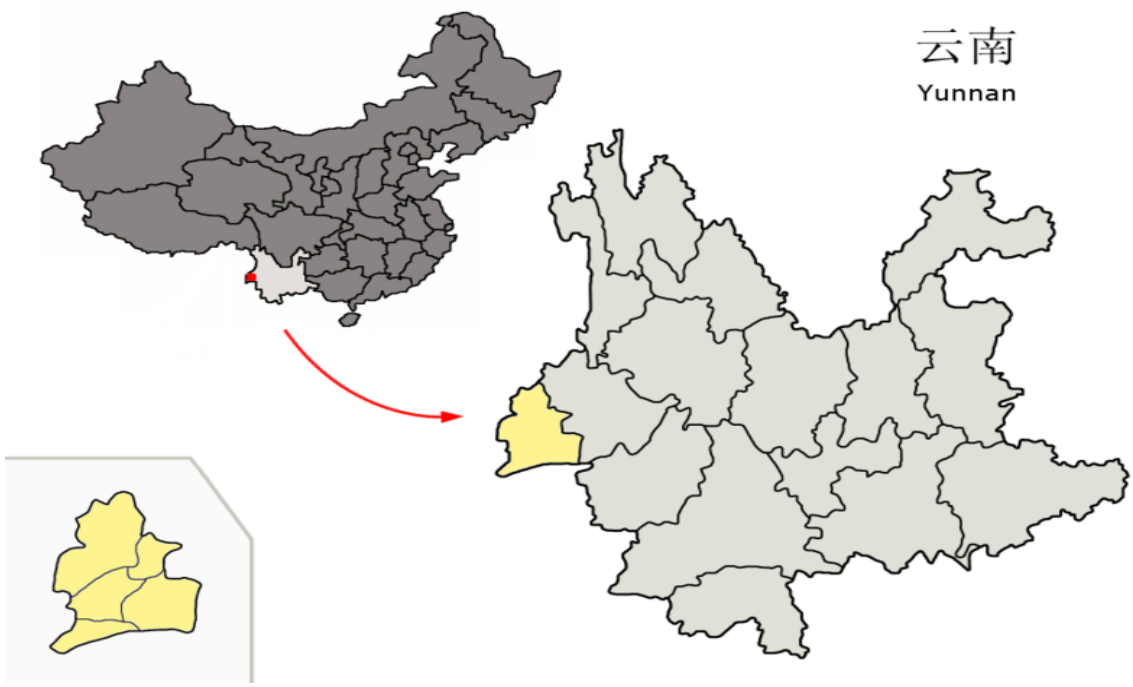

Figure 1.2. Map of Dehong Prefecture, Yunnan, P.R. China (source: Wikipedia)

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CHAPTER II

Barriers to Methadone Maintenance Treatment Participation Post-release: Perspectives of Compulsory Drug Detoxification Center Detainees

Introduction

China has been plagued by the dual epidemics of HIV/AIDS and illicit drug use since the early 1990s when the first outbreak of HIV was detected among a group of injecting drug users (IDUs) in Ruili City, Dehong Prefecture, Yunnan Province (Wang, 2007). By 2002, all 31 provinces, municipalities and autonomous regions had reported HIV infections among IDUs, who were the largest contributors to the HIV epidemic in the country (Chinese MOH, 2011). An estimate in 2007 reported 44.7% of 50,000 newly identified cases were infected via heterosexual contact, and 42% through injection drug use suggesting the Chinese HIV epidemic is shifting from high risk population to the general population (Wang et al., 2009). Moreover, HIV infection rates among IDUs varied significantly from region to region. Xinjiang, Guangxi, and Sichuan provinces reported 41.31%, 16.95%, and 15.12% respectively while HIV infection rate among IDUs in Yunnan province reached 52.51% (Bao, Liu, & Lu, 2010). This signals the continued need to target drug users in order the curb the spread of HIV/AIDS.

The Chinese government has traditionally taken a punitive approach toward drug users by placing them in compulsory drug detoxification and rehabilitation centers operated under the auspices of the Chinese Ministry of Public Security. China began registering drug users and building drug detention centers in 1990. The official statistics documented there were about 70,000 registered drug users in 1990 and that number had reached 1.35 million in 2010 (China's Annual Report on Drugs, 1990–2010). As of 2008, approximately 260,000 drug users had been

placed in mandatory treatment centers for rehabilitation and there were about 60,000 drug-related criminal cases recorded. (China's Annual Report on Drugs, 2009). According to a study in 2004, there were about 700 compulsory and 200 voluntary detoxification centers in China (Zhao et al., 2004). Despite these efforts, relapse rates post-release are high since these centers were ineffective in reducing drug use (Liu et al., 2006).

Heroin is the most common drug of abuse in China, accounting for about 85% of illicit drugs used (Sullivan & Wu, 2007). Heroin addiction is considered a chronic condition often characterized by period of abstinence, relapse, treatment, and incarceration (Hser, Hoffiman, Grella, & Anglin, 2001). And addiction is associated with high risk of blood-borne infections such as HIV and hepatitis C, as well as overdose death, criminal activities, and re-incarceration (Hser et al., 2004). Methadone maintenance treatment (MMT) is convenient, safe and effective substitution therapy for opioid dependence, and a large body of research has shown the efficacy of MMT programs for treatment of drug addiction and subsequent reduction in HIV risk behaviors and infections (Marsch, 1998; Darke et al., 2000). In response to heroin addiction and HIV infection, the Chinese government made a significant move to implement MMT programs in 2004 to mitigate HIV transmission (Pang et al., 2007). By the end of 2011, 623 counties and districts within 28 provinces, autonomous regions, and municipalities had established a total of 738 MMT clinics, providing treatment for a cumulative total of more than 344,000 patients. The total number of patients currently receiving daily treatment is 140,000 with an average of 190 patients receiving treatment in each MMT clinic (Ministry of Health, People's Republic of China, 2012).

The MMT program in China demonstrates the government's strong commitment to control HIV/AIDS and illicit opioid use. However, it also faces challenges with the rapid

expansion of the clinics. The overall coverage rate is low (Lu, Fang, & Wang, 2008); a study in Dehong Prefecture, Yunnan Province found that coverage was only about 6.28% of all registered drug users in the region (Xing et al., 2012). Moreover, the dropout rate is high among most MMT clinics (Lu et al., 2008). Lin et al. (2010) found many MMT patients continued to engage in drug-using behaviors while in treatment, which resulted in high program drop out rates.

This study used a qualitative approach to explore barriers to MMT initiation post-release among compulsory drug detoxification detainees. In addition, those with a history of MMT enrollment were surveyed to document their reasons for dropping out of treatment. Previous studies have documented barriers to MMT initiation among MMT patients (Lin, Wu, & Detels, 2011; Wu et al., 2012); however, until now there has been no study conducted from the perspectives of incarcerated drug users. We aimed to identify factors and suggest strategies to break the vicious cycle of drug abuse, increased health risks, criminal behaviors, and re-incarceration.

Methods

Study site

This study was conducted inside the Mangshi City Compulsory Drug Detoxification Center in Dehong Prefecture, Yunnan Province. Mangshi City, previously Luxi City, is the capital of Dehong Prefecture. We chose not to conduct this study in Ruili City, where the first HIV outbreak in China was identified, due to its complexity as a bordering port and the overwhelming aids of HIV/AIDS related programs there by foreign governments. Ruili is more complex because its compulsory drug detoxification center houses some Burmese nationals who do not speak Mandarin Chinese and do not receive HIV-related services provided by the Chinese government. In addition, most drug users in Ruili have received numerous interventions and

participated in countless interviews conducted by various foreign governments' aid programs thus they are likely to have more knowledge compared to an average drug user in Dehong Prefecture. Lastly, Ruili's MMT clinic is the only one in the country that charges only 2 yuan for daily visits because the local government is providing a large amount of funding to subsidize the MMT program that is neither replicable nor sustainable in any other clinic in the country. As a result, Mangshi was chosen as the study site since it's also known to have a history of drug use problems and is centrally located in Dehong prefecture. This decision was made collectively with the local health officials considering time and resource constraints.

The selected study Center is under the jurisdiction of the Mangshi City Public Security Bureau and also serves as a transitional detention center for criminals who committed non-drug related offenses before they are sentenced to long-term prison. There is a health clinic (known in Chinese as "Guanaizhongxin" or care center) inside the facility that houses offenders who have HIV/AIDS or other illnesses and are considered unsuitable to participate in intensive manual labor. Therefore, detainees inside this particular Center are locked up in a prison cell that houses between 6-12 people. During the day, they are allowed to leave their cell for an hour or so but spend most of the time inside the prison cell. Occasionally, local health bureau and MMT clinic staff will come and promote health education and harm-reduction messages. At the time of this study, the Center housed approximately 100 detainees. In addition, the health clinic inside the Center offers a special service to those already on methadone prior to incarceration. If one participated in MMT at the local clinic before arrest, he or she is allowed to take a daily oral dose inside the Center to continue maintaining treatments. When released, they can return to the local clinic for continued service.

Study participants

In August 2011, we conducted 20 in-depth qualitative interviews with study participants recruited via referrals from health clinic staff inside the Center. A total of 23 potential participants were screened but three were deemed ineligible due to communication problems (inability to comprehend Mandarin, the official language in China) and/or mental illness. The criteria for referral and participation included: (1) being at least 18 years old; (2) having a history of drug addiction; (3) being eligible to participate in a community-based MMT per criteria of the Chinese government; and (4) being able to provide voluntary informed consent. In order to maximize information obtained, we purposely selected participants of different ages, ethnicity, education levels, marital status, and detoxification history.

Data collection

All in-depth interviews were conducted by the principal investigator and lasted between 35-75 minutes (mean 45 minutes) in a private room of the health clinic inside the Center. During the interview, a semi-structured guide was used to inquire about study participants' demographic information, history of drug use, detoxification treatment experience, perception of and willingness to participate in MMT services. Additional assessments were also made of those with previous MMT experience in regard to their failure to stay in treatment and reluctance to re-enroll in MMT services. Open-ended questions were asked to allow participants to express themselves freely and to provide opportunities for the principal investigator to probe further. All interviews were conducted in Mandarin and participants had the option of responding in Mandarin or local dialects. Before the interview, the study purpose, procedures, and potential benefits and risks were discussed with each participant, and informed consent was obtained in all cases. Participants were told they could withdraw at any point and refusal would not result in

punishment inside the compulsory rehabilitation center, as participation was completely voluntary. Each participant received a toiletry bag valued at 20 yuan (USD 3.17) as compensation. All interviews were digitally recorded and transcribed for analysis. The Institutional Review Boards of University of California, Los Angeles and National Center for AIDS/STD Control and Prevention of China CDC approved this study.

Data analysis

After interviews were completed, digitally recorded audio files were transcribed verbatim into Chinese and entered into Microsoft Word files by native speakers fluent in both Mandarin and local dialects. Crosschecking and confirmation of the transcriptions were conducted by the principal investigator to assure quality. ATLAS. ti (v.6), a qualitative data analysis software, was used to manage and analyze the transcribed data (Muhr, 2004).

Data were analyzed by identifying themes occurring most frequently and focused on those related to barriers to participate and reasons for dropping out of MMT services. The preliminary coding system containing key concepts and categories was developed based on interview guides. Revisions were made using transcripts with newly identified topics and factors. Any discrepancies were carefully examined and resolved until no new topics emerged to suggest a need for further revisions. All transcriptions, coding, and analyses were completed in Chinese and the final results were later translated into English.

Results

Of the 20 participants interviewed, 95 percent were male, 65 percent were between ages 30 and 39 years, 35 percent were married, and about half had completed middle school. Han ethnicity accounted for 45 percent of the sample while Dai and Jingpo ethnic minorities represented 15 and 30 percent, respectively. The most common reason for arrest this time was

heroin use, accounting for 65 percent, about 55 percent reported multiple detention histories having two to five times prior compulsory detoxification experiences, 65 percent reported ever injecting drugs, and 55 percent reported a history of MMT enrollment (Table 2.1).

It is important to note at the time of data collection, the entire Center only housed two females among all its detainees. Only one female detainee was interviewed because the other showed signs of psychosis as side effects of long-term stimulant use.

From the in-depth interviews, we learned that most detainees had multiple arrest history and interactions with both the health sector and the public security. Yet they still lacked knowledge of access to care and had high relapse rates. Code and text searches of the interview transcripts revealed two general themes and they were assessed qualitatively: (1) barriers to MMT participation, and (2) reasons for dropping out of MMT.

Barriers to MMT participation

No perceived needs to participate in MMT

Some participants reported that being incarcerated for a long period of time allowed them to have a fresh beginning. They believed their self-determination would be enough to abstain from illicit drug use and did not perceive a need to enroll in MMT service. By being incarcerated for a long period of time, these detainees had the belief that they had recovered from drug addiction. As one participant claimed:

> *"I think compulsory drug rehabilitation works. I was clean and free of illicit drugs when I was released. As long as I try hard to stay abstinent, I'll be alright. There is no need for me to participate in MMT."*
>
> *(Male, 39 years old, heroin user, no history of MMT enrollment)*

Misconceptions and lack of MMT-related knowledge

The majority of detainees who were unwilling to give MMT a try had received various misinformation and had already made up their minds not to try due to fear. As one participant claimed:

> *"Some people are unwilling to try methadone due to fear. They think it's also a kind of illicit drug and are afraid of side effects. Some people don't know its benefits and most have not tried."*
>
> *(Male, 29 years old, heroin and ephedrine user, MMT enrollee inside the Center)*

In addition, some detainees were unwilling to participate in MMT due to a common misconception that methadone is more toxic than heroin and the withdrawal symptoms are severe. In the words of one participant:

> *"Methadone… I have no desire to try. I prefer controlling my mind and the drug demon inside. They said methadone has more severe withdrawal symptoms as compared to heroin. When it's not available, it is very painful to clean it out of the system. I heard other detainees said that people incarcerated in Dehong prefecture compulsory rehabilitation center had no access to methadone. After two to three days, they could not handle the withdrawal symptoms and used knifes to cut themselves.*
>
> *(Male, 38 years old, opium user, no history of MMT enrollment)*

Financial difficulties

MMT patients, like most drug users, often were unemployed or unable to make enough money to support themselves. They frequently depended on their family to provide a living and

pay for their treatments. Some may not have been able to continue treatment if they were unable to secure financial support from family members. In Mangshi City, daily MMT treatment costs 5 yuan per day (USD 0.79) but was sometimes cheaper with the incentive program to keep patients in treatment. But additional cost associated with receiving treatment such as daily transportation fees may be a financial burden, especially to those living in remote areas and/or far from the MMT clinic. A detainee stated:

> *"I dropped out of MMT after 10 months because of economic reasons. Money was tight and I thought I could go to Myanmar to buy heroin and sell it here to make a living. Just like my friends. Then I was caught by the police and sent here."*
>
> *(Male, 32 years old, heroin user, MMT dropout)*

Lack of Accessibility

This study took place in a rural mountainous area. Although the Chinese government has expanded MMT clinics nationwide, some remote villages are still not covered. Sometimes the distance to a clinic from a remote mountainous village is only 5 km but it might take over an hour to travel the rough roads. As one participant explained:

> *"Methadone is not available in my town. The closest clinic is an hour away and is inconvenient." (Male, 34 years old, heroin user, no history of MMT enrollment)*

In addition, sometimes MMT service providers would consider some potential enrollees non-locals if they lived far away and in remote villages. The providers are concerned about dropout soon after initial enrollment that will lower their clinic's patient retention rate. As a

result, they often discouraged enrollments. One participant suggested that as his reason for not wanting to enroll in MMT:

> *"We live up in the mountains [Xishan, or west mountain]. The government wouldn't let us enroll. We are very far from the hospital and MMT clinic. But I think a few folks in my village are enrolling in MMT now. I'm not sure what's the latest situation but I've never tried it."*
>
> *(Male, 35 years old, heroin user, no history of MMT enrollment)*

Reasons for dropping out of MMT

Inconvenience

The majority of study participants cited inconvenience as their reason for dropping out of MMT. Specifically, some claimed transfer service between clinics was hard to obtain; some complained that methadone is in liquid form and can only be taken daily via supervision in the clinic instead of prescribed as pills to go. Two study participants explained:

> *"I think methadone is inherently good. But it's inconvenient. It's not like I can stay and live in Mangshi City all of my life. Sometimes my boss makes us travel around the area but methadone has to be taken daily. When I get to other areas, it's difficult and inconvenient to get my daily dose. I know about transfers in between clinics. But it's too much of a hassle. And my job takes me to remote areas where it's impossible to get methadone." (Male, 36 years old, heroin user, MMT dropout)*

> *"If I wanted to go away for a few days, I am unable to do so. If it comes in a pill form, that will be great."(Female, 34 years old, heroin user, MMT enrollee inside the Center)*

Side Effects

Side effects were also reported as one of the main reasons for dropping out of MMT. Most frequently cited side effects including constipation, erectile dysfunction, and perceived liver and kidney damages. In the words of two participants:

> *"Methadone hurts my stomach and gives me constipation. Makes it uncomfortable. Some of my friends had it worst with a loss of sexual activity." (Male, 36 years old, heroin and ephedrine user, MMT enrollee inside the Center)*

> *"They also said it's bad for the kidney and has other side effects. … I would consider trying the Chinese traditional medicine's substitution pill." (Male, 37 years old, heroin, opium, and ephedrine user, no history of MMT enrollment)*

Dosage

Complaints of low dosage among MMT dropouts were common. Lin and Detels (2011) found that MMT service providers were often reluctant to prescribe higher dosage fearing liability when a patient overdosed by using heroin concurrently. But study participants suggested that low dosage led to cravings, and concurrent illicit drug use was the result. One participant complained:

> *"I'm definitely going to continue with methadone when I'm released. But I'd really like them to increase my dosage. When I don't get enough, then I have minor withdrawal symptoms and cravings."*
>
> *(Male, 29 years old, heroin and ephedrine user, MMT enrollee inside the center)*

Concurrent illicit drug use leads to police arrest

A high proportion of detainees reported MMT participation prior to incarceration; however, they were arrested for using ephedrine, a kind of stimulant, rather than heroin. These participants said that the strips for urine tests could only detect opiates so they were never caught with a positive urine test in MMT clinics. And it was nice to have the ability to get high with ephedrine once in awhile or for special occasion. However, urine-testing strips used by the public security can detect different types of illicit drugs and these MMT participants were often arrested and placed in compulsory rehabilitation. Concurrent use of methadone and opiates were also common and resulted in several arrests. As reported earlier, some participants complained that they were not given a high enough dosage and when cravings hit, they used heroin. Some interviewees switched to stimulants to get high after long-term MMT treatment since they were no longer feeling the effect of heroin. The use and abuse of ephedrine has become prevalent in this region and among all walks of life. One participant stated that even government workers and hospital staff used it. In the words of two participants:

> *"When you are on methadone and use heroin, you don't get any feeling and no longer wants to use it. But then using methamphetamine and ephedrine kind of illicit drugs, one would get high and have reactions. Therefore, nowadays a lot of people are on methadone and concurrently using stimulants like ephedrine. They are no longer satisfied with using heroin. But the end result is still the same. We would all end up here incarcerated. In my opinion, then taking methadone or not makes no difference."*
>
> *(Male, 35 years old, opium and heroin user, MMT dropout)*

"I believe half of all MMT patients in our local clinic are using ephedrine. I felt nothing using heroin now that I'm on methadone. Using ephedrine is safe in MMT clinic since it's not detectable by the urine test. I'm clean and high."

(Male, 28 years old, heroin and ephedrine user, MMT enrollee inside the Center)

Stimulant use

Most stimulant users did not perceive their use of stimulants as abusing drugs. They did not have any physical withdrawal symptoms and only used occasionally or recreationally. Most reported that they did not believe one can be addicted to stimulants and saw no physical threats to addiction as compared to heroin or other opiates. Concurrent use of opiates and stimulants was quite common. Many former MMT patients were arrested and placed in the Center for using ephedrine and reported that they believe a majority of MMT patients were on it. Some respondents stated that stimulant was merely used to treat hangover from excessive use of alcohol. Three participants explained:

"I went to Myanmar to visit my relatives. They were gambling and staying up late. Ephedrine was used to help people stay awake and I also had some. Ephedrine is not addictive. Maybe you'll get addicted with long term use but I only use it occasionally."

(Male, 38 years old, opium user, no history of MMT enrollment)

"I don't think one can get addicted to ephedrine because physically I don't feel pain or have withdrawal symptoms. It's like when you don't use it, nothing will happen. Unlike using opium or heroin, you'll have physical reactions."

(Male, 28 years old, heroin and ephedrine user, MMT enrollee inside the Center)

"Ephedrine addiction is easy to kick. I did not feel any pain [as compared to heroin]."

(Male, 36 years old, heroin and ephedrine user, MMT enrollee inside the Center)

Discussion

The Chinese MMT program is still in its infancy. The rapid growth from 8 clinics in 2004 to over 700 clinics by the end of 2011 may have compromised the quality and comprehensiveness of services. Although many opiate users have benefited greatly from positive outcomes associated with MMT participation such as decreased drug use and increased quality of life and employment (Sullivan & Wu, 2007), there are still barriers to MMT initiation and maintenance. Our findings re-confirmed barriers such as side effects, inconvenience, low dosage, financial difficulties, and lack of access previously reported by MMT patients in China (Philbin & Zhang, 2010; Lin, Wu, & Detels, 2011; Lin & Detels, 2011).

The Chinese MMT Working Group has already addressed the problems associated with lack of access by establishing more extension sites/satellite clinics in remote areas and increasing the number of mobile vans in service (Yin et al., 2010). In addition, for areas unreachable by the MMT program, a clean needles and syringes exchange program is in place to ensure coverage for all IDUs in order to maximize the harm reduction program (Liu et al., 2008).

Misconceptions about MMT are a big obstacle preventing MMT clinics to increase enrollment. Most potential MMT patients acquired their knowledge of methadone through their peers or drug using friends. Some may have even participated in voluntary detoxification centers back in the 1990s when methadone was used to reduce withdrawal symptoms of opiates. They may have experienced complete detoxification after 2-3 months with gradual reduced dosage of

methadone. This previous encounter with methadone may lead to their desire to maintain a minimum dosage when enrolled in a MMT program through their belief that a high dosage may harm their health (Xu et al., 2012). Health educational programs inside compulsory drug detoxification centers must address this misinformation in order to increase MMT enrollment. For our study population, compulsory drug detoxification centers may be the best place to enhance MMT related education programs. The detainees are locked up all day and have plenty of time for learning. More creative programs could be designed to include graphic visual aids or videos of role-plays to dismiss false claims regarding MMT. Misconceptions about services have often led to poor compliance and dropouts (Gossop, Stewart, & Marsden, 2003) and should be taken seriously in order to address the low MMT enrollment issue.

Concurrent opiate use is common in MMT patients worldwide (Guichard et al., 2003; Li et al., 2011) and was cited as the most common reason of relapse/re-incarceration among our study participants. A study conducted by Li et al. (2012) found that 45% of MMT clients in China were involved in ongoing illicit opiate misuse. Occasional use of opiates during MMT does not indicate treatment failure (Gossop et al., 1989), and the Chinese MMT program has developed a tolerant policy toward this issue (Sullivan, 2011). However, MMT clinic staff needs to strengthen cooperation and obtain support from the local police to address problems associated with occasional use and arrest. The police are often under pressure to arrest a certain number of drug users to meet their quota to support the compulsory drug detoxification center operation. A more lenient policy may have to be worked out between these two government agencies to ensure the maximum effectiveness of the MMT program.

A growing problem of concurrent methadone and concurrent stimulant use, especially ephedrine in this region, also needs to be explored. Ephedrine was only recently introduced to

the Chinese drug market and has gained its popularity among younger drug users in the last few years (Liu et al., 2006; Lu et al., 2008). It is possible that ephedrine is spread among drug users attending MMT clinics where they often linger to exchange information with their peers. Currently, the MMT clinics do not test for non-opiate drugs due to cost reasons (Sullivan, 2011) since 85% of registered drug users in China use opiates (Sullivan & Wu, 2007). However, among newly registered drug users, 38% reported using amphetamine-type stimulants such as ephedrine (Xing & Xia, 2010). As suggested by the study participants, methadone only suppresses opiate cravings but does not inhibit the euphoric effects of stimulants. As a result, the use of stimulants among MMT patients is on the rise during treatment. One study in Yunnan found ephedrine use among MMT patients nearly tripled from just 11.9% prior to enrollment to 31% one year after MMT (Li et al., 2011). Thus, it is time for the Chinese MMT program to reconsider the need to test for non-opiate drugs as part of the monitoring program.

Moreover, participants claimed that ephedrine, unlike heroin, is not addictive and there is nothing to worry about occasional use. More stimulant addiction-related educational materials need to be developed and disseminated. Graphic images of those suffering from severe psychosis as a result of stimulant abuse might be produced and incorporated into an educational booklet. An unexpected proportion of our study participants had been arrested by the police and placed in compulsory drug detoxification centers due to concurrent use of methadone and stimulant. Our findings document an emerging phenomenon that long-time illicit drug users are moving away from using traditional drugs such as opiates and initiating the use of stimulants to seek that euphoric feeling associated with illicit drug use. Multiple drug use is dangerous and difficult to control. Future intervention and educational programs must address this problem.

Concurrent drug use also points out that methadone can only suppress the physical

problem associated with addiction. Comprehensive programs that include psychological counseling and behavioral modification are equally important to retain patients and prevent high dropouts. In our study sample, 55% of participants had a history of MMT enrollment, affirming the high dropout rate.

There were several limitations in this study that should be noted when interpreting our results. The study was conducted in a unique compulsory drug detoxification center that offered methadone to some detainees and housed those with severe addiction and illness. In addition, the geographic location of the study, rural China, has had a high illicit drug use problem for the last two decades. Thus, findings may not be generalized to other parts of China. In addition, the study population was not representative of all incarcerated drug using population in China.

TABLE 2.1. Demographic characteristics of the study population (N=20)

Characteristic	N=20	%
Gender		
Male	19	95.0
Female	1	5.0
Age (years)		
20-29	5	25.0
30-39	13	65.0
40-49	1	5.0
50 and above	1	5.0
Education level		
Primary school	5	25.0
Middle school	10	50.0
High/vocational school	3	15.0
College/University	2	10.0
Marital status		
Married	7	35.0
Divorced	4	20.0
Never married	9	45.0
Ethnicity		
Han	9	45.0
Dai	3	15.0
Jingpo	6	30.0
Other	2	10.0
Reason of arrest/incarceration		
Heroin use	13	65.0
Ephedrine use	4	20.0
Opium use	1	5.0
Gambling & other crimes	2	10.0
Compulsory detoxification experience		
First time offender	4	20.0
2-5 times	11	55.0
> 5 times	5	25.0
Ever injected drug		
Yes	13	65.0
No	7	35.0
History of MMT enrollment		
Yes	11	55.0
No	9	45.0
Mobile phone use		
Yes	19	95.0
No	1	5.0

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CHAPTER III

Does Ethnic Difference Matter? Exploring Gaps in Methadone Maintenance Treatment Services among Opiate Users of Different Ethnicities in Dehong Prefecture, Yunnan

Introduction

In the last two decades, China has faced the challenges of dual epidemics of drug use and HIV/AIDS (Sullivan & Wu, 2007). At the end of 2009, approximately 740,000 people were living with HIV/AIDS in China with an estimated one-third of these infections attributed to injection drug use (IDU) (UNAIDS, 2010). The epidemics disproportionally affected drug users of ethnic minorities living in rural areas of China, and youth below the age of 35 who made up the largest percentage (59.7%) of all registered drug users (Ministry of Health, People's Republic of China, 2011). China is a diverse country and the government has officially recognized 56 ethnic groups including the Han majority. Approximately 36% of all reported HIV/AIDS cases were among ethnic minorities although they represent less than 9% of China's total population (UNAIDS, 2009). The HIV prevalence is highest in provinces bordering Myanmar (Yunnan Province), Vietnam (Guangxi Autonomous Region), and Central Asia (Xinjiang Uygur Autonomous Region); along drug trafficking routes of the Golden Triangle and Golden Crescent (Sullivan & Wu, 2007).

Traditionally, the government has taken a punitive approach toward drug users. The police affiliated with the Public Security Bureau often arrest drug users and place them in compulsory drug treatment. Official statistics documented there were about 70,000 registered drug users in 1990 and that number reached 1.35 million in 2010 (China's Annual Report on Drugs, 1990–2010). A government report documented were 264,000 people receiving

compulsory drug treatment, labor re-education treatment, and compulsory isolation treatment in 2008 (China's Annual Report on Drugs, 2009). The government claimed that these drug education/treatment and rehabilitation centers emphasized long-term support and aftercare to prevent relapse and recidivism, but the relapse rate post-release among detainees was still high. One study reported an 80% relapse rate within one month post-release (Zhao et al., 2006).

Recently, the Chinese government has switched gears and started promoting harm reduction programs such as methadone maintenance therapy (MMT) for opiate users in its effort to curb the spread of HIV/AIDS. According to Chinese government official statistics, about 77.5% of all registered drug users used heroin (China's Annual Report on Drugs, 2010). In 2004, eight pilot MMT clinics were established and their effectiveness measured (Pang et al., 2007). As a result, the MMT program was scaled up and as of the end of 2011 there were over 700 clinics covering 28 provinces, autonomous regions, and municipalities providing treatment for a cumulative total of more than 344,000 patients (Li et al., 2012). The total number of patients currently receiving daily treatment is 140,000 with an average of 190 patients receiving treatment in each MMT clinic (Ministry of Health, People's Republic of China, 2012).

The first HIV outbreak in China was reported in Dehong Prefecture, Yunnan Province among a group of IDUs in 1989 (Wang, 2007). Dehong Prefecture documented approximately 14,900 HIV/AIDS cases through 2008, representing 6.2% of all China's reported HIV/AIDS cases though it only accounted for 0.08% of China's total population. IDUs represent nearly two-thirds of people living with HIV/AIDS in Dehong Prefecture and continue to be an epidemic "core-transmitter' group (Jia et al., 2008). A study estimated that 1.3% of the total population in Dehong Prefecture was living with HIV/AIDS in 2005 (Jia et al., 2008).

Dai and Jingpo ethnic minorities are the two largest minority groups in Dehong; the prefecture's official name is Dehong Dai and Jingpo Autonomous Prefecture. Jia et al. (2010) reported that although Dai and Jingpo minorities represented only 0.3 and 2.5% of Yunnan's population, they have accounted for 7 and 9% of all new HIV infections, respectively. Most of the HIV/AIDS cases were among drug users. IDUs residing in the compulsory detoxification centers are estimated to represent about 25% of all drug users in Dehong Prefecture (Dehong CDC, 2010). The Dai people are valley-dwelling rice cultivators living mostly in Yunnan Province and are closely related to the Lao and Thai people who form a majority in Laos and Thailand. In addition, some Dai ethnic minorities also live in neighboring Vietnam and Myanmar. The Jingpo national ethnic minority is the same ethnicity as the people of Kachin State of Myanmar. The ties of these two ethnic groups living in Dehong Prefecture and their neighboring countries are strong and further promote drug trafficking and HIV infection in the region. Ethnic minorities represent less than 9% of China's total population; however, they account for more than 30% of the reported HIV/AIDS cases (UNAIDS, 2009).

One of the first eight pilot MMT clinics was established in Dehong Prefecture in 2004 and as of 2012, there was a total of 5 MMT clinics and 8 satellite stations/extension sites (Yang personal communication). A study in Dehong Prefecture, Yunnan Province found that MMT coverage covered only about 6.28% of all registered drug users in the region (Xing et al., 2012). Considering the severe epidemic of HIV/AIDS and the low availability of MMT programs in this region, efforts should be made to increase coverage and identify barriers to MMT participation.

Very few studies have examined the ethnic differences among drug users. Often, ethnic minorities are more vulnerable and disadvantaged and their cultural practices are ignored when designing disease prevention programs. As mentioned earlier, the HIV epidemic among IDUs in

China is most severe in provinces with mostly ethnic minorities. This study aims to identify the underlying barriers to MMT participation in regard to ethnic differences.

Methods

Study site

This study was conducted inside a compulsory drug detoxification center located in Mangshi City, Dehong Prefecture, Yunnan Province. Mangshi City, previously Luxi City, is the capital of Dehong Prefecture, and was chosen because of its geographic center and problems related to drug use. We chose not to conduct this study in Ruili City, where the first HIV outbreak in China was identified, due to its complexity as a bordering port and the overwhelming support/aid of HIV/AIDS related programs there by foreign governments. Ruili is more complex because its compulsory drug detoxification center houses some Burmese nationals who do not speak Mandarin Chinese and do not receive HIV-related services provided by the Chinese government. In addition, most drug users in Ruili have received numerous interventions and participated in countless interviews conducted by various foreign governments' aid programs. Thus they are likely to have more knowledge compared to an average drug user in Dehong Prefecture. Lastly, Ruili's MMT clinic is the only one in the country that charges only 2 yuan for daily visits because the local government provides a large amount of funding to subsidize the MMT program that is neither replicable nor sustainable in any other clinic in the country.

Our particular study Center is under the jurisdiction of the Yunnan Provincial Public Security Bureau and houses drug offenders whose residencies are within Dehong Prefecture. At the time of this study, the Center housed approximately 600 detainees who spend an average of two years in incarceration and engage in re-education through labor activities as part of their treatment. Under the new Drug Control Law, which went into effect on June 1, 2008, the Center

is no longer called re-education through labor but an "Isolated Compulsory Drug Detoxification Center." The security at this Center is very strict; visitors are not allowed to bring any communication and filming devices into the prison compound. This rule also applies to the Health Clinic staff that is stationed inside the big Center but outside each separate prison compound. With the support of local Health and Public Security officials, this study was allowed to take place.

Participant recruitment

In November 2011, we recruited a total of 250 study participants residing in the Center. Health Clinic staff inside the Center referred potential participants to the study. The duties of these health workers include providing a daily regimen of highly active antiretroviral therapy (HAART) to those detainees with AIDS and conducting quarterly biological blood test monitoring for drug resistance and side effects. In addition, they are responsible for treating minor illness such as colds as well as cuts and scrapes. The Public Security police inside the Center were not involved in the participant selection/referral process in order to avoid coercion. Recruited participants were told they could withdraw at any point and refusal would not result in punishment inside the Center, since participation was completely voluntary. The criteria for participation included: (1) being at least 18 years old and have a hukou, a permanent residency, in Mangshi City; (2) having a history of drug addiction; (3) being eligible to participate in a community-based MMT per criteria of the Chinese government; and (4) being able to provide voluntary informed consent. Due to the nature of compulsory drug detoxification centers with their limited access and high security, our study participants were selected using a convenient sampling method taking anyone who fit our participation criteria and was willing to participate until we reached our target sample size of 250. We hypothesized that with a sample size of 250

we would be able to capture differences among participants in terms of ages, ethnicity, education levels, marital status, and detoxification history. It is important to note that this Center houses males only.

Data collection

A cross-sectional questionnaire was administered face-to-face among detainees residing in the Yunnan Provincial Isolated Compulsory Detoxification Center by the principal investigator and a team of trained interviewers. These interviewers were recruited from the Dehong Prefecture Center for Disease Control and Prevention and have had extensive experience working with the incarcerated population. A brief training session for the interviewers was conducted before the survey took place. All interviews were conducted inside the prison compound as detainees were not allowed to leave. A private area was secured for the interviews and each survey lasted approximately 30 minutes. The questionnaire inquired about study participants' demographic information, history of drug use, detoxification treatment experience including voluntary and compulsory detentions as well as MMT participation, and their knowledge of HIV and HCV. All interviews were conducted in Mandarin and participants had the option of responding in Mandarin or local dialects, whichever they were more comfortable with. Each participant received a toiletry bag valued at 20 yuan (USD 3.17) as compensation for their time. Before the interview, the study purpose, procedures, and potential benefits and risks were discussed with each participant, and informed consent was obtained in all cases. The Institutional Review Boards of the University of California, Los Angeles and National Center for AIDS/STD Control and Prevention of China CDC approved this study.

Data analysis

For the purpose of this study, we reduced the sample size from N=250 to N=188, excluding those who reported using stimulants as their primary drug type and those who belonged to ethnicities other than Han, Jingpo, or Dai. The reason for eliminating them from the analyses was that this study aimed to identify service gaps for opiate users among the three aforementioned ethnicities. In addition to the two ethnic minority groups, the Han ethnicity was included for the analysis because it is the largest ethnicity of China.

Data collected was entered twice independently into Excel 2010 (Microsoft Corp., Redmond, WA, USA, ©1985-2010) to ensure accuracy and analyzed using IBM-SPSS for mac v. 20.0 (IBM-SPSS, Chicago, IL, USA, ©1968-2012).

The frequencies and percents of male opiate user's socio-demographic characteristics were first calculated. These variables included age, ethnicity, educational level, marital status, occupation, monthly household income, self-described relationship with family, and religious affiliation. In addition, smoking status, type of illicit drug used for this arrest, route of opiate use before incarceration, type of illicit drugs ever experienced, self-reported HIV and HCV tests, and internet and mobile phone use were also reported. Descriptive statistical analyses were performed using the Chi-square test for categorical variables and one-way ANOVA for continuous variables. The *p*-value significance was set at 0.05. In addition, mean and standard deviations for continuous variables and frequencies, and percent for each level of categorical variables were calculated.

A logistic regression model was built to identify factors associated with willingness to participate in MMT post-release. Prior knowledge and subjective interests were used to fit selected variables entered into the model. Socio-demographic variables such as age, ethnicity,

education level, marital status, being a farmer, and monthly household income were forced into the model. Drug using behavior variables that were significantly (i.e., $p < 0.05$) or marginally (i.e., $0.05 < p < 0.10$) associated with willingness to participate in MMT were also included.

Results

Table 3.1 displays the characteristics of study participants. Among the 188 male opiate users, the mean age was 33.2 years (SD=7.7; range: 18–60). Approximately 44.7% of them were Jingpo ethnic minority, 23.9% were Dai ethnic minority, and 31.4% were Han majority ethnicity. Most participants had not gone beyond middle school education (88.3%) and almost half were married (44.1%). Over half were farmers (58.0%) followed by 16.5% laborers and 10.1% truck or taxi drivers. Most reported no religious beliefs (76.6%) and were smokers (98.9%). Overall, heroin was the most popular opiate used (81.9%) but approximately 6.9% reported using ephedrine, a type of stimulant, as the reason for incarceration. Only 28.7% reported injection behavior prior to incarceration. 89.4% reported ever being tested for HIV while only 16.5% reported ever being tested for HCV.

Table 3.2 presents socio-demographic characteristics of study participants by ethnicity. Education level, occupation, and religious beliefs all had significant differences among the three ethnic groups with p-value <0.0001. There were statistical significant differences ($p < 0.05$) among the three ethnic groups in marital status, monthly household income, and self-described relationship with family. In particular, the Jingpo ethnicity had mostly only attended primary school (45.2%), were married (50.0%), worked as farmers (81.0%), reported less than 2000 yuan household income per month (60.7%), and had good relationships with family (90.5%). The other ethnic minority, Dai men, had approximately one-third of respondents reporting no schooling and another one-third reporting primary school as their highest educational level. Over

half of the Dai ethnic group was married, worked as farmers (68.9%), had a monthly household income over 2000 yuan (53.3%), reported good relationships with family (80.0%), and almost half of them reported being Buddhist. In contrast, the Han ethnicity had more education with attendance at middle school (61.0%), were mostly single (42.4%), worked in non-agricultural fields (20.3% reported being a truck or taxi driver and 30.5% reported being a laborer), had a monthly household income over 2000 yuan (71.2%), and most had no religious beliefs (86.4%). The Han majority also had the lowest proportion of participants reporting having a good relationship with their family (71.2%).

Table 3.3 displays methadone maintenance treatment utilization, drug use behaviors, and knowledge of HIV and HCV. We assessed MMT clinic knowledge among all three groups. The majority of the Han ethnicity knew the location of the clinic but did not participate in MMT whereas half of the Jingpo ethnicity did not know the location of the clinic but had only heard about methadone (p <0.0001). Overall, approximately 90% of study participants were unwilling to participate in MMT post-release. Most of the Jingpo ethnic minority had neither heard of nor knew the location of the MMT clinic and were uninterested in MMT participation after release. There were many reasons given for unwillingness to participate in MMT. The top five reasons were: already clean from illicit drug use (41.2%); methadone is harder than heroin to withdrawal from (25.9%); methadone is equally toxic as heroin (20.0%); side effects (18.8%), No desire to try/never tried (11.2%); and lack of MMT knowledge (6.5%). This was a multiple response question and each reason independently accounted for 100%. Almost half of the Han ethnicity cited that methadone is harder than heroin to withdraw from as their reason for being unwilling to participate in MMT while approximately one-third of the Dai ethnicity and 12% of the Jingpo ethnicity reported this as their reason. The p-value (p <0.0001) was statistically significant. In

addition, two other reasons also had statistically significant differences among all three groups with p=0.01. These were side effects with one-third of the Han ethnicity and approximately 10% of the Jingpo ethnicity citing this as their reason for being unwilling to participate in MMT post-release. This observed difference is logical as most Jingpo ethnicity neither knew of nor had ever heard of MMT and probably had no experience with MMT to know about any side effects. It is also important to note that almost 20% of the Jingpo ethnicity had no desire to try MMT while only about 2% of the Han ethnicity reported this as their reason. Another statistically significant difference among all three ethnic groups was the distance required to travel to attend a MMT clinic (p <0.0001). The Jingpo ethnic minority had to travel the farthest to receive MMT service whereas the Dai ethnic minority had the shortest distance.

The participants in this study were all primarily opiate users; however, some reported using stimulants such as ephedrine as the reason for their incarceration in the Center. Approximately 15.3% of the Han ethnicity and 8.9% of the Dai ethnicity reported being arrested for using stimulants whereas only 2.4% of the Jingpo ethnicity reported stimulant use as the reason of arrest (p = 0.02). Almost 40% of the Han ethnic group and about one-third of the Dai ethnic group reported injection behavior while the Jingpo ethnic group only had about 20% (p = 0.03). Han and Dai ethnic groups reported more frequent incarcerations in compulsory drug detoxification centers as compared to the Jingpo ethnic group (p = 0.002). The Han and Dai groups had more years of drug use (p = 0.004).

Regarding HIV testing, the Han ethnicity reported 100% testing rate and the other two ethnic minority groups reported about 85%. Overall, the HIV testing rate was high among all three ethnic groups. However, HIV and HCV knowledge levels were statistically significant among all three groups with Han scoring the highest and Jingpo the lowest (p < 0.0001).

The logistic regression model did not identify any statistically significant predictor for willingness to enroll in MMT post-incarceration (Table 3.4). But the sample only included 188 participants, which may not have provided enough power to demonstrate any significant differences. In addition, that almost all study participants expressed their unwillingness to participate in MMT post-release may have skewed the data.

Discussion

Results from this study show that there were disparities among these three ethnic groups in Dehong Prefecture. As the Chinese government continues to expand MMT clinics nationwide, perhaps now is the time to increase MMT participation by acknowledging the different needs and cultural practices of the varied ethnic groups. Most of the Chinese IDUs are ethnic minorities and may benefit greatly if programs are designed to meet their specific needs. Even in a rural area like Dehong, potential MMT patients are not homogeneous and recruitment strategies and treatments should vary based on the special characteristics and cultures of different ethnic groups.

Education level is important to take into consideration when designing prevention and education programs for drug users. Overall, most of our study participants were educated through middle school; however, over half of the Dai and Jingpo ethnic groups had obtained only primary school education while some had no schooling. We found about one-third of Dai participants had no schooling and this is an important factor to take into consideration when designing programs related to MMT and HIV knowledge. Future intervention studies should design prevention messages in simple texts and include simple graphic images.

Most Dai and Jingpo participants were farmers while only one-third of Han participants reported being laborers. Farmers are disproportionally affected by drug use, and HIV/AIDS in

this region and the MMT program should make an effort to recruit this population. Being a farmer is very different from working in other sectors. When the harvest season arrives, farmers have to work extra hard to ensure they harvest all crops possible. This may be a problem for methadone participants who have to attend the clinic daily to obtain their oral dose. In addition, they may be forced to miss attending the clinic since these ethnic minorities also reported living far from clinics. Special arrangements for those living in mountainous areas during the harvest season should be established to provide daily methadone treatment for farmers to reduce the possibility of their dropping out. The Chinese government has already set up satellite stations/extension sites for those living in remote areas but these sites often do not provide adequate service. More comprehensive programs similar to those provided at the MMT clinic should also be implemented in these locations to encourage and retain participation.

The importance of family involvement in drug recovery in China has been stressed (Li et al., 2009, Liu et al, 2010) and interventions to increase family involvement in treatment should be explored. The data revealed that over half of the two ethnic minority groups were married and over 80% reported having a good relationship with their family. This suggests that successful drug prevention and treatment programs in China should recruit family members to help drug users heading down the road of recovery. Family members including a spouse and parents play a role in encouraging treatment participation and compliance. Often, MMT participants would report the reason for their willingness to participate was the encouragement from family members who also pay for their monthly treatment. MMT programs should consider establishing a program for family members to help monitor the patients' progress to recovery.

Participants' knowledge of the MMT location was also assessed. Over half of the Jingpo ethnicity reported having heard of MMT but had no knowledge of the clinic location. This may

be due to the fact this ethnic minority lives in mountainous areas as opposed to the other ethnic groups where access to a MMT clinic is less difficult. More educational programs on the knowledge of MMT should be disseminated among this ethnic group and the government should consider opening satellite stations/extension sites to serve this population. Although about 60% of the Han ethnicity and 40% of the Dai ethnicity reported having knowledge of MMT and the clinic location, they did not participate in MMT. We think this is a reflection of the Stage of Change model (Prochaska et al., 1977), which theorized that there are pre-contemplation and contemplation stages before taking action. These study participants have some knowledge of MMT programs but not enough to initiate a change of behavior to participate in MMT. This group is of great interest for future studies as interventions should be designed to motivate them to enroll and stay in MMT programs. Currently, only about 20% of Dai and Han men reported having experienced MMT, but about 40% of the Dai and almost 60% of the Han ethnic groups had knowledge of the MMT clinic location but had never tried MMT. According to the Stage of Change model, those with knowledge of the MMT clinic location but no MMT experiences are in the pre-contemplation stage. Future intervention programs designed to increase MMT coverage should consider how to motivate this group from pre-contemplation all the way to action stage by taking up MMT.

Negative perceptions or misconceptions about MMT were reported as reasons for unwillingness to participate after release by an overwhelming majority of our study participants regardless of their ethnicity. This is of great concern since the relapse rate one month post-release is over 80% (Zhao et al., 2006). If they are not in MMT, they may engage in risky injection behaviors and drug use that may lead to HIV infection, transmission to others, or overdose. The data reported several common negative perceptions/misconceptions as reported by

other studies (Lin et al., 2010; Philbin & Zhang, 2010). We found that almost half of all participants had a false sense that abstinence is the best solution to opiate addiction as they reported being clean from illicit drugs thus no need for MMT. The results also showed that about 42% of Han people had the misconception that methadone is harder than heroin to withdraw from. Detainees observed other MMT participants inside the Center who withdrew from methadone in about one week while heroin users only suffered three days. The problem is that they did not understand the idea of maintenance and that if one stayed in treatment with a satisfying dosage, he or she would not have suffered any withdrawal symptoms. These negative perceptions/misconceptions leading to their unwillingness to participate in MMT should be examined closely. Educational programs need to address each of these misconceptions. This is vital if the government wants to increase MMT coverage and retention.

The HIV and HCV knowledge raw scores were higher in Han people and lower in the ethnic minorities. This is understandable since knowledge is often associated with educational level. Han people had higher education levels overall and probably also more exposure to intervention programs since they mostly live in town-centers. More education programs need to target the ethnic minorities, and intervention programs should be developed in their dialects to increase access and coverage. Mediums such as educational films, public service ads on television and radio, posters, and charts should be utilized to ensure a broader response.

Wu et al. found that being Jingpo was a risk factor for drug use in 1997 and our data a decade later concurred with this finding. There is a greater need to design specific programs to reduce drug use in this ethnic minority that has been severely affected by HIV and drug use. Complex factors need to be considered including geographic location of dwellings, low education level, occupation, and economic factors.

Several study limitations need to be noted here. Generalization of our findings must be made with caution as the opiate using population and drug treatment services in Dehong prefecture may be different from other parts of China. In addition, each ethnic group is somewhat unique and may vary in cultural characteristics. Our study participants may not be representative of other detainees in other compulsory detoxification centers of China. Since this was the region where the first HIV outbreak took place in China, drug users generally had more knowledge of HIV and had participated in more education and prevention programs. This is evidenced in their HIV knowledge levels where Han people had almost 90% correct answers and the other two ethnic groups had about 70% correct answers. This was higher compared to HIV knowledge scores reported elsewhere in China. It is also important to note data collected was self-reported by detainees inside a compulsory detoxification center. Our data suggested that only 28.7% of study participants had engaged in injection behavior prior to their incarceration, which is low compared to other studies. More than half of registered heroin users reported intravenous injection as their primary mode of heroin administration in China (Lu, Fang, & Wang, 2008). We suspect there is an underreporting among this group due to social desirability bias. Most of our study participants had participated in numerous study surveys and may have the knowledge that risky injection behaviors lead to HIV infection and may not want to be stigmatized as being HIV-positive. The cross-sectional study design only created a snapshot of drug users incarcerated in compulsory detoxification center in the study area. It is also important to note that we only interviewed incarcerated males.

Our study participants were all detainees inside a compulsory drug detoxification and rehabilitation center, an ideal environment to educate and prepare them for life after detention. Future intervention programs should design a comprehensive Pre-release Relapse Prevention

Program that includes education and knowledge regarding MMT and stimulant abuse, overdose prevention, and HIV and HCV risk reduction geared toward those soon to be released. This is an ideal setting to prepare for life after detention since they are confined to the center. Currently, most of the compulsory drug detoxification centers in China are still punitive and little treatment is offered to prepare detainees for a drug-free life post-release. By providing knowledge related to MMT programs, we may be able to increase coverage upon relapse of opiate use.

The MMT program in China is still in its infancy. The existence of 56 ethnic groups complicates the goal of harm reduction and drug control. Not all ethnic groups should be treated similarly in terms of prevention messages, treatment, and intervention strategies. Specific circumstances and cultural practices should be taken into consideration when recruiting potential MMT patients. When necessary, rules should be modified/relaxed to allow greater access for ethnic minorities. A comprehensive Pre-release Relapse Prevention Program should be implemented among detainees inside compulsory drug detoxification centers and more training regarding methadone should also be provided to Center staff.

TABLE 3.1. Frequency of socio-demographic characteristics of male opiate users (N=188)

Characteristic	N	%
Age[a]		
18-25	28	14.9
26-35	90	47.9
36-45	57	30.3
46 and above	13	6.9
Ethnicity		
Jingpo	84	44.7
Dai	45	23.9
Han	59	31.4
Educational level		
No schooling	33	17.6
Primary school	61	32.4
Middle school	72	38.3
High school/vocational school	18	9.6
College and above	4	2.1
Marital status		
Single	64	34.0
Married	83	44.1
Divorced	35	18.6
Cohabited	6	3.3
Occupation		
Farmer	109	58.0
Truck/Taxi driver	19	10.1
Business	11	5.9
Laborer	31	16.5
Unemployed	13	6.9
Other	5	2.6
Monthly household income (yuan)[b]		
< 2000	89	47.3
≥ 2000	99	52.7
Religious beliefs		
Buddhism	30	16.0
Christian	14	7.4
None	144	76.6
Smoker		
Yes	186	98.9
No	2	1.1
Route of opiate use before incarceration		
Smoke/inhale	134	71.3
Inject	54	28.7

Characteristic	N	%
Illicit drug used for this arrest		
Heroin	154	81.9
Opium	19	10.1
Ephedrine	13	6.9
Methamphetamine	2	1.1
Type of illicit drugs ever tried/used (multiple responses)		
Heroin	172	91.5
Ephedrine	86	45.7
Opium	69	36.7
Diazepam	19	10.1
Triazolam	16	8.5
Methamphetamine	12	6.4
Ketamine	7	3.7
Marijuana	8	4.3
Ecstasy	5	2.7
Self-reported HIV test		
Yes	168	89.4
No	20	10.6
Self-reported HCV test		
Yes	31	16.5
No	123	65.4
Don't know	34	18.1
Mobile phone use		
Yes	167	88.8
No	21	11.2
Internet use		
Yes	43	22.9
No	145	77.1

[a] Age: $M = 33.20$, $SD = 7.68$. [b] Monthly household income: $M = 2{,}296.81$, $SD = 2, 822.84$.

TABLE 3.2. Socio-demographic characteristics of male opiate users by ethnicity (N=188)

Characteristic	Jingpo (N=84)	Dai (N=45)	Han (N=59)	*P*-value[a]
Age (%)				0.42
18-25	15.5	15.6	13.6	
26-35	53.6	42.2	44.0	
36-45	27.4	28.9	35.6	
46 and above	3.5	13.3	6.8	
Educational level (%)				**<0.0001**
No schooling	17.9	35.6	3.4	
Primary school	45.2	33.3	13.6	
Middle school	29.8	24.4	61.0	
High school	7.1	6.7	15.3	
College and university	0.0	0.0	6.7	
Marital status (%)				**0.01**
Single	31.0	28.9	42.4	
Married	50.0	55.6	27.1	
Divorced	13.1	15.5	28.8	
Cohabited	5.9	0.0	1.7	
Occupation (%)				**<0.0001**
Farmer	81.0	68.9	16.9	
Truck/Taxi driver	4.8	6.7	20.3	
Businessman	3.6	2.2	11.9	
Laborer	8.2	13.3	30.5	
Unemployed	1.2	6.7	15.3	
Other	1.2	2.2	5.1	
Monthly household income (RMB) (%)				**0.001**
< 2000	60.7	46.7	28.8	
≥ 2000	39.3	53.3	71.2	
Self-described relationship with family (%)				**0.02**
Good	90.5	80.0	71.2	
Fair	9.5	15.6	27.1	
Poor	0.0	4.4	1.7	
Religious beliefs (%)				**<0.0001**
Buddhism	1.2	48.9	11.9	
Christian	15.5	0.0	1.7	
None	83.3	51.1	86.4	

a. Chi-square test was performed for categorical variables and one-way ANOVA was performed for continuous vari

TABLE 3.3 MMT utilization, drug use behaviors, and knowledge of HIV and HCV among male opiate users by ethnicity (n=188)

Characteristic	Jingpo (n=84)	Dai (n=45)	Han (n=59)	*P*-value[a]
MMT and clinic knowledge (%)				**<0.0001**
Knew address, did MMT	2.4	20.0	18.6	
Knew address, but no MMT	21.4	40.0	59.4	
Heard of MMT but don't know clinic address	51.2	26.7	16.9	
Never heard of MMT	25.0	13.3	5.1	
Willing to participate in MMT post-release (%)				0.89
Yes	10.7	8.9	8.5	
No	89.3	91.1	91.5	
Reasons for unwilling to participate in MMT post-release (%), multiple responses				
Already clean from illicit drug (41.2%)	42.7	41.5	38.9	0.91
Methadone is harder than heroin to withdraw from (25.9%)	**12.0**	**29.3**	**42.6**	**<0.0001**
Methadone is equally toxic as heroin (20.0%)	16.0	14.6	29.6	0.10
Side effects (18.8%)	**9.3**	**22.0**	**29.6**	**0.01**
No desire to try/never tried (11.2%)	**18.7**	**9.8**	**1.9**	**0.01**
Lack of MMT knowledge (6.5%)	10.7	7.3	0.0	0.05
Distance to MMT clinic in km, Mean ± SD	**23.1±20.1**	**3.8±3.0**	**7.5±11.4**	**<0.0001**
Drug of abuse when arrested this time (%)				**0.02**
Opiates	97.6	91.1	84.7	
Stimulants	2.4	8.9	15.3	
Route of opiate use 1 yr prior to incarceration (%)				**0.03**
Smoke/inhale	81.0	66.7	61.0	
Inject	19.0	33.3	39.0	
Reported number of participation in compulsory rehab, Mean ± SD	**1.3±1.1**	**2.6±3.9**	**2.5±2.5**	**0.002**
Years of drug use, Mean ± SD	**9.3±5.9**	**11.2±6.6**	**13.0±6.9**	**0.004**
Ever tested for HIV (%)				0.006
Yes	84.5	84.4	100.0	
No	15.5	15.6	0.0	
HIV knowledge raw score (10 questions), Mean ± SD	**6.7±2.4**	**7.0±3.0**	**8.8±1.7**	**<0.0001**
HCV knowledge raw score (14 questions), Mean ± SD	**4.7±4.8**	**5.8±5.0**	**8.2±4.3**	**<0.0001**

a. Chi-square test was performed for categorical variables and one-way ANOVA was performed for continuous variables; significance set at $p<0.05$

TABLE 3.4 Logistic regression of willingness to participate in MMT post-release by demographic characteristics, drug use history, and detoxification experience

Predictor	Odds ratio	95% Confidence limits	*P*-value
Age	1.051	0.978, 1.129	0.175
Being a Jingpo	0.683	0.168, 2.778	0.594
Being a Han	0.837	0.158, 4.429	0.834
Education level	1.454	0.762, 2.774	0.256
Marital status	0.837	0.253, 2.775	0.771
Being a farmer	2.523	0.550, 11.582	0.234
Monthly household income	1.000	0.999, 1.000	0.169
Internet use	0.340	0.090, 1.288	0.112
Years of drug use	1.013	0.917, 1.120	0.799
Poly drug use	1.282	0.408, 4.028	0.671
Voluntary detox experience	1.059	0.969, 1.156	0.207
Compulsory detox experience	0.664	0.404, 1.091	0.106
Re-education through labor experience	0.808	0.327, 1.998	0.644

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CHAPTER IV

Multiple Illicit Drug Use Among Detainees in Compulsory Detoxification Center: Implications for Drug Abuse Treatment

Introduction

Illicit opiates have a long history of use in China and can be traced back to the late Qing Dynasty. In the 1950s, the Communist government led by Chairman Mao carried out a successful national anti-drug campaign to eliminate illicit drug abuse and declared victory; China was considered a drug-free country for the next 30 years (Chen et al., 2006). However, as China switched to a market economy and adopted an "open-door" policy in the 1980s, problems associated with drug abuse re-emerged at rocket speed (United National Office on Drugs and Crime, 2003).

Heroin is the most popular illicit drug of choice in China and favored by 85% of all drug users (Sullivan & Wu, 2007) although there has been an increase in stimulant-type of drug abuse in the last few years (Lu, Fang, & Wang, 2008; Bao et al., 2012). In addition, opium (both in its natural and synthesized [kaku] forms) is also popular along the major drug trafficking routes. Currently, the majority of heroin comes from Myanmar into Yunnan province and/or from Vietnam into Guangxi province before heading to other parts of China along the drug trafficking route (Beyrer et al., 2000). Heroin abusers often started using through sniffing or snorting (Li et al., 2002) before switching to injecting for both economical and dosage reasons. According to the National Behavioral Surveillance Data in 2004, 49% of heroin users administered through injection and 43% shared needles (China Ministry of Health and UN Theme Group on HIV/AIDS in China, 2004).

There has been a dramatic increase in the use and abuse of stimulants over the last decade in China (Yang & Xia, 2010). Stimulants are often called non-traditional or synthesized drugs because they are relatively new as compared to the more traditionally used opiates and are quickly replacing them to become the most widespread illicit drugs of choice in China (Wang & Liu, 2007). In 2005, official statistics showed that 59,500 people used stimulants, accounting for 6.7% of all registered drug users. Nonetheless, in 2010 that number increased significantly to 0.43 million, accounting for 28% of the 1.54 million registered drug users (China's National Narcotics Control Commission, 2011). Unlike opiate users, most stimulant users reported noninjection as their main route of administration (Wang et al., 2008). Stimulants in China often refer to methamphetamine, ecstasy, ketamine, and "magu" pills (a mixture of methamphetamine and caffeine) and are taken orally in clubs, discos, or homes (Yang & Xia, 2010; Ding, 2012). The use of stimulants concentrated mostly in Southeastern China and metropolitan business centers and spread quickly in the 1990s (Bao & Liu, 2009; Qian, Schumacher, Chen, & Ruan, 2006). In the last decade, use of stimulants has been reported in entertainment venues within urban areas of major cities such as Shanghai and Shenzhen (Bao & Liu, 2009; Liu & Detels, 2011) but has been rarely reported in rural areas.

Injecting opiate users have long been considered the largest contributors to China's HIV epidemic since the first outbreak was reported in Ruili, Yunnan in 1989. However, since 2007 the major route of HIV transmission has shifted; sexual transmission has taken over as the dominant route of HIV infection and the proportion of transmission via injecting opiate use has declined (State Council HIV/AIDS Working Committee Office and the UNTG on HIV/AIDS in China, 2009). Use of stimulants is believed to be associated with some of the new HIV infections via sexual transmission. There are several negative health consequences associated with

stimulants use including stroke, kidney failure, and in particular, unsafe sexual behaviors, which may be one of many reasons contributing to the increase of HIV infection through sexual transmission (Colfax & Guzman, 2006).

Methadone maintenance treatment (MMT) is effective in reducing opiate and other illicit drugs use, criminal activity, risk of overdose, and improving an individual's overall wellbeing (Darke et al., 2000). The Chinese MMT program was successfully established in 2004 and rapidly expanded to over 700 clinics by 2011 covering 28 provinces, autonomous regions, and municipalities providing treatment for a cumulative total of more than 344,000 patients (Pang et al., 2007; Yin et al., 2010; Li et al., 2012). Despite its success, multiple illicit drugs use was commonly reported (Li et al., 2011; Li et al., 2012) and these users were more likely to drop out, have their treatment terminated, and relapse compared to those not using multiple drugs (Downey et al., 2000).

Concurrent opiate use (Li et al, 2012; Lin, Wu, & Detels, 2011) and multiple substances abuse (Li et al, 2011) have been reported previously among MMT patients in China. However, we believe this is the first study to examine multiple illicit drug use among detainees inside a compulsory drug detoxification center in rural China. The purpose of this study is to examine the current state of drug abuse in the region and identify factors associated with multiple illicit drug use. The findings have implications for improving the current drug abuse treatment programs in China.

Methods

Study site

This study was conducted inside a compulsory drug detoxification center located in Mangshi City, Dehong Prefecture, Yunnan Province. Mangshi City, previously Luxi City, is the

capital of Dehong Prefecture, and was the chosen study site because of its geographic center and history of drug abuse. Ruili City, where the first HIV outbreak in China was identified, was not selected as the study site due to its complexity as a border port and the overwhelming support of HIV/AIDS related programs by foreign governments. Ruili is more complex because its compulsory drug detoxification center houses some Burmese nationals who do not speak Mandarin Chinese and do not receive HIV-related services provided by the Chinese government. In addition, most drug users in Ruili have received numerous interventions and participated in countless interviews conducted by various foreign governments' aid programs so that they are likely to have more knowledge compared to an average drug user in Dehong Prefecture. Lastly, Ruili's MMT clinic is the only one in the country that charges only 2 yuan for a daily visit with the local government providing a large amount of funding to subsidize the MMT program that is neither replicable nor sustainable in any other clinic in the country.

Our particular study Center is under the jurisdiction of the Yunnan Provincial Public Security Bureau and houses drug offenders whose residencies are within Dehong Prefecture. At the time of this study, the Center housed approximately 600 detainees who spend an average of two years in incarceration and engage in re-education through labor activities as part of their treatment. Under the new Drug Control Law, which went into effect on June 1, 2008, the Center is no longer called "re-education through labor" but Isolated Compulsory Detoxification Center. The security at this Center is very strict; visitors are not allowed to bring any communication and filming devices into the prison compound. This rule also applies to the Health Clinic staff stationed inside the big Center but outside each separate prison compound. With the support of local Health and Public Security officials, this study was allowed to take place.

Participant recruitment

In November 2011, we recruited a total of 250 study participants residing in the Center. Health Clinic staff inside the Center referred potential participants to the study. The duties of these health workers include providing a daily regimen of highly active antiretroviral therapy (HAART) to those detainees with AIDS and conducting quarterly biological blood test monitoring for drug resistance and side effects. In addition, they are responsible for treating minor illness such as colds as well as cuts and scrapes. The Public Security police inside the Center were not involved in the participant selection/referral process in order to avoid coercion. Recruited participants were told they could withdraw at any time and refusal would not result in punishment inside the Center since participation was completely voluntary. The criteria for participation included: (1) being at least 18 years old; (2) having a history of drug addiction; (3) being eligible to participate in a community-based MMT per criteria of the Chinese government; and (4) being able to provide voluntary informed consent. Due to the constraints described, we tried our best to reduce sampling bias but were only able to obtain a convenient sample taking anyone who was eligible according to our recruiting criteria and referred to the study by the Health Clinic staff. It is important to note that this Center houses males only.

Data collection

A cross-sectional institution-based questionnaire was administered face-to-face among detainees residing in the Yunnan Provincial Isolated Compulsory Detoxification Center by the principal investigator and a team of trained interviewers. These interviewers were recruited from the Dehong Prefecture Center for Disease Control and Prevention and have had extensive experience working with the incarcerated population. A brief training session for the interviewers was conducted before the survey took place. All interviews were conducted inside

the prison compound. A private area was secured for the interviews and each survey lasted approximately 30 minutes. The questionnaire inquired about study participants' demographic information, history of drug use, detoxification treatment experience including voluntary and compulsory detentions as well as MMT participation, and their HIV and HCV knowledge. All interviews were conducted in Mandarin and participants had the option of responding in Mandarin or local dialects, whichever they were more comfortable with. Each participant received a toiletry bag valued at 20 yuan (USD 3.17) as compensation for their time. Before the interview, the study purpose, procedures, and potential benefits and risks were discussed with each participant, and informed consent was obtained in all cases. The Institutional Review Boards of the University of California, Los Angeles and National Center for AIDS/STD Control and Prevention of China CDC approved this study.

Data analysis

Data collected were entered twice independently into Excel 2010 (Microsoft Corp., Redmond, WA, USA, ©1985-2010) to ensure accuracy and analyzed using IBM-SPSS for mac v. 20.0 (IBM-SPSS, Chicago, IL, USA, ©1968-2012).

The frequencies and percents of male drug user's socio-demographic characteristics were first calculated. These variables included age, ethnicity, educational level, marital status, occupation, monthly household income, self-described relationship with family, and religious belief. In addition, smoking status, type of primary illicit drug used, type of illicit drug used for this arrest, type of illicit drugs ever experienced, and self-reported HIV and HCV tests were also reported. Descriptive statistical analyses comparing opiate and stimulant users were performed using the Chi-square test for categorical variables and one-way ANOVA for continuous variables. Opiates referred to illicit drugs such as heroin and opium and stimulants referred to

ephedrine and methamphetamine. The *p*-value significance was set at 0.05. In addition, mean and standard deviations for continuous variables and frequencies, and percent for each level of categorical variables were calculated.

A multivariate logistic regression model was built to predict factors that influence drug users' preference of primary drug type. Prior knowledge and subjective interests were used to fit variables into the model. Socio-demographic variables such as age, ethnicity, education level, and monthly household income were forced into the model. Drug use behavior and detoxification center experience related variables that were significantly (i.e., $p < 0.05$) associated with primary drug type were also included. An additional multivariate logistic regression model was built to identify factors associated with multiple drug use. Multiple drug use is defined as having experience with more than illicit drugs such as heroin, opium, ephedrine, and/or methamphetamine. A similar method was used to build the second model.

Results

Table 4.1 summarized frequencies of study participants' characteristics. Almost half of all study participants were between ages of 26 and 35 with a mean age of 32.68±7.71. Approximately one-third belonged to the Jingpo ethnic minority, one-third to the Han ethnic majority, and one-quarter to the Dai ethnic minority. About 16% of all study participants reported never having received any formal schooling while 38.8% reported having some middle school education and only 2.4% reported ever attending college. Almost half were married and one-third reported being single. Over half reported being farmers with 14.4% reported being laborers and 10.4% being a truck or taxi driver. The average monthly household income was 2530.60±3359.37 yuan with about 54.4% having earned over 2000 yuan per month. Almost 80% had a self-described good relationship with family and about one-quarter reported having a

religious belief. An overwhelming majority reported being a smoker and 78.8% were opiate users while 21.2% reported stimulants as their primary drug of choice. Heroin was the most common drug of abuse reported for this arrest at 66.0% and ephedrine came in second with 22.8% reported being arrested for using it. About 90.4% of all study participants reported ever being tested for HIV while only 16.8% reported being tested for HCV.

Table 4.2 displays socio-demographic characteristics, drug use behaviors, methadone maintenance treatment (MMT) participation, and detoxification history by primary drug type. Ethnicity, and drug of abuse when arrested this time both showed significant differences between opiate and stimulant users with p-value <0.0001. Almost half of all primary opiate users were of the Jingpo ethnicity. Internet use and years of drug use also had statistical significance with p-value equaled to 0.001. Primary opiate users had longer histories of drug use (average of 11.0 vs. 7.6 years); however, primary stimulant users were more internet savvy (47.2 vs. 24.4%). Age, occupation, religious beliefs, and voluntary detoxification experience all yielded statistical significance with p-value <0.05. Primary opiate users were older, less religious, had more experience with voluntary detoxification while more primary stimulant users reported being a businessman. Over half of our study participants regardless of their primary drug of choice reported multiple drug using behaviors. In regards to MMT participation, there was no statistical significance between opiate and stimulant users. Overall, most of them had heard of MMT, very few had ever participated in MMT, and an overwhelming majority was unwilling to participate in MMT post-release. Reasons for unwillingness to participate in MMT post-release were explored in Chapter 2 and will not be discussed further here.

Table 4.3 presents the multivariate logistic regression model for predicting factors that influence drug users' preference of main drug type. Being a Jingpo ethnic minority was 11.831

times more likely to favor opiates over stimulants (p-value < 0.0001). Study participants who had more experiences with voluntary detoxification were 1.412 times more likely to favor opiates over stimulants (p-value = 0.015) and those reported internet use were 2.453 times more likely to be stimulant users (p-value = 0.036).

Table 4.4 shows when taking the covariates together, study participants who reported younger age of drug initiation were 1.088 times more likely to use multiple drugs (p-value = 0.003). Study participants with more experiences of compulsory detoxification were 1.289 times more likely report multiple drugs use (p-value = 0.028).

Discussion

Our study sample had 21.2% participants reporting use of stimulants as their primary drug of choice. This was a surprise finding and of great concern since we went into this rural setting assuming most drug users preferred opiates as the literature suggested. Previously, most of stimulant uses in China were reported in urban metropolitan areas such as Shanghai and Shenzhen (Ding, 2012; Liu and Detels, 2012; Yang and Xia, 2010). Our study participants' stimulant of choice was ephedrine with 81.1% followed by methamphetamine with 13.2%. Li et al. (2011) was the only other study that observed an increase use of ephedrine among MMT participants one year after enrollment; however, the study was conducted in Kunming City, the provincial capital and urban setting of Yunnan Province. We documented that the extent of stimulant use among drug users has spread to rural areas previously affected only by opiate use.

Age and ethnicity also played roles in drug type preference. Our data suggested that younger drug users were more willing to experience with stimulants while older drug users still preferred opiates. An overwhelming majority of the Jingpo ethnicity reported using opiates. This may be due to the fact that most Jingpo ethnic minority lived in secluded mountainous areas and

had less interactions/mixing patterns with other drug users. On the other hand, the Dai ethnicity and the Han ethnicity both reported approximately 40% of stimulant use. They may have had better accessibility to this kind of drug or think it's trendier to use stimulants. Years of drug use and experiences with detoxification centers were predictors of primary drug type. Opiate users tend to have longer duration of drug use and more experiences with detoxification. This concurred with the fact that stimulant users were younger.

Problems associated with multiple drug use also need to be addressed. We found that over half of both opiate and stimulant users had experience with at least two illicit drugs. This may be common among drug users with a long history of drug abuse and needs to be taken into consideration when designing prevention programs. In addition, determining the methadone dosage to be administered to those with a history of multiple drug use can be challenging. MMT clinic staff may be hesitant to prescribe higher dosage having fears that patients may still be on other drugs, which could lead to overdose. The danger of multiple drug abuse needs to be emphasized among new MMT enrollees.

The fact that over one-fifth of the study population preferred stimulants suggests that future drug abuse treatment programs need to consider broader treatments. Having one solution for opiate users such as community-based MMT program is not enough to combat multiple drug abusers. Future drug abuse treatment programs need to be more comprehensive and designed to deal with all kinds and types of drug abusers. For MMT clinics, now is the time to start using urine strips that can detect both opiate and stimulant drugs.

There were several limitations in this study. Due to the constraint of the prison-based setting, we were only able to use a convenient sampling strategy and our study sample may not be representative of drug users residing in other compulsory drug detoxification centers. In

addition, our study site was severely affected by the HIV epidemic and the Chinese government has implemented many prevention programs in the last decade. Findings from this study are not generalizable to other prison-based drug users in other regions of China. In regards to multiple drug use, we were only able to report one or more than one drugs used. But we were unable to distinguish between the types of drugs used. It is possible a multiple drug user only used opiates instead of combining both types. Our data did not allow us to further distinguish drug types and future study should consider designing the questionnaire in a way to differentiate this. All data were self-reported and social desirability bias may exist for sensitive questions.

Our findings documented an emerging phenomenon that long-time illicit drug users are moving away from using traditional drugs such as opiates and initiating the use of stimulants to seek that euphoric feeling associated with illicit drug use. Multiple drugs use is dangerous and difficult to control. Future intervention and educational programs must address this problem. The Chinese government has made incredible efforts to combat opiate abuse and HIV infection by introducing harm reduction programs such as MMT and has made some achievements. But little has been done for abusers of other drug types. With the increase of stimulants abuse among drug users, new strategies and programs need to be developed and integrated to obtain maximum effectiveness for the conquest of HIV.

TABLE 4.1. Frequency of demographic characteristics of all male participants (N=250)

Characteristic	N	%
Age[a]		
18-25	48	19.2
26-35	118	47.2
36-45	68	27.2
46 and above	16	6.4
Ethnicity		
Jingpo	88	35.2
Dai	68	27.2
Han	81	32.4
Other	13	5.2
Educational level		
No schooling	40	16.0
Primary school	80	32.0
Middle school	97	38.8
High school/vocational school	27	10.8
College and above	6	2.4
Marital status		
Single	83	33.2
Married	116	46.4
Divorced	43	17.2
Cohabited	8	3.2
Occupation		
Farmer	139	55.6
Truck/Taxi driver	26	10.4
Business	24	9.6
Laborer	36	14.4
Unemployed	18	7.2
Other	7	2.8
Monthly household income (yuan)[b]		
< 2000	114	45.6
≥ 2000	136	54.4
Self-described relationship with family		
Good	197	78.8
Fair	48	19.2
Poor	5	2.0
Religious beliefs		
Buddhism	49	19.6
Christian	15	6.0
None	186	74.4

Characteristic	N	%
Smoker		
Yes	246	98.4
No	4	1.6
Primary illicit drug type used		
Opiates	197	78.8
Stimulants	53	21.2
Illicit drug used for this arrest		
Heroin	165	66.0
Opium	19	7.6
Ephedrine	57	22.8
Methamphetamine	9	3.6
Type of illicit drugs ever tried/used (multiple responses)		
Heroin	203	81.2
Ephedrine	135	54.0
Opium	149	59.6
Diazepam	25	10.0
Triazolam	22	8.8
Methamphetamine	29	11.6
Ketamine	11	4.4
Marijuana	11	4.4
Dolantin	12	4.8
Ecstasy	7	2.8
Self-reported HIV test		
Yes	226	90.4
No	24	9.6
Self-reported HCV test		
Yes	42	16.8
No	165	66.0
Don't know	43	17.2

[a] Age: $M = 32.68$, $SD = 7.71$. [b] Monthly household income: $M = 2{,}530.60$, $SD = 3{,}359.37$.

TABLE 4.2. Demographic characteristics, drug use behaviors, MMT participation, and detoxification history by primary drug type (N=250)

Characteristic	Opiates (N=197)	Stimulants (N=53)	*P*–value[a]
Age (%)			**0.02**
18-25	15.2	34.0	
26-35	48.2	43.4	
36-45	29.9	17.0	
46 and above	6.7	5.6	
Ethnicity (%)			**<0.0001**
Jingpo	42.6	7.5	
Dai	22.8	43.5	
Han	29.9	41.5	
Other	4.7	7.5	
Educational level (%)			0.87
No schooling	16.8	13.2	
Primary school	32.0	32.1	
Middle school	39.1	37.7	
High school/vocational school	10.2	13.2	
College and above	1.9	3.8	
Marital status (%)			0.95
Single	33.5	32.1	
Married	45.7	49.1	
Divorced	17.8	15.1	
Cohabited	3.0	3.7	
Occupation (%)			**0.01**
Farmer	56.3	52.8	
Truck/Taxi Driver	10.7	9.4	
Businessman	6.6	20.8	
Laborer	17.3	3.8	
Unemployed	6.6	9.4	
Other	2.5	3.8	
Religious beliefs (%)			**0.007**
Buddhism	15.7	34.0	
Christian	7.1	1.9	
None	77.2	64.1	
Ever heard of MMT (%)			0.83
Yes	84.3	83.0	
No	15.7	17.0	
Ever participated in MMT (%)			0.76
Yes	11.7	13.2	
No	88.3	86.8	

Characteristic	**Opiates (n=197)**	**Stimulants (n=53)**	***P*–value[a]**
Willingness to participate in MMT post-release (%)			0.96
Yes	9.6	9.4	
No	90.4	90.6	
Multiple drugs use			0.65
1 drug only	38.1	41.5	
≥ 2 drugs	61.9	58.5	
Internet use (%)			**0.001**
Yes	24.4	47.2	
No	75.6	52.8	
Years of drug use, mean (SD)	11.0 (6.6)	7.6 (6.7)	**0.001**
Voluntary detox experience, times, mean (SD)	2.1 (4.3)	0.6 (1.3)	**0.012**

a. Chi-square test was performed for categorical variables and one-way ANOVA was performed for continuous variables

TABLE 4.3. Logistic regression of opiates as main drug type among study participants by demographic characteristics and drug use history and behavior

Predictor	Odds ratio	95% Confidence limits	*P*-value
Age	0.998	0.946, 1.053	0.954
Being Jingpo ethnicity	11.831	3.732, 37.500	**<0.0001**
Being Han ethnicity	1.209	0.526, 2.775	0.655
Completed middle school	1.011	0.657, 1.557	0.960
Monthly household income	1.198	0.540, 2.658	0.657
Internet use	0.408	0.176, 0.943	**0.036**
Years of drug use	1.073	0.996, 1.155	0.063
Number of voluntary detox	1.412	1.068, 1.865	**0.015**
Number of compulsory detox	1.029	0.823, 1.287	0.802
Multiple drug use	0.821	0.367, 1.839	0.632

TABLE 4.4. Logistic regression of multiple drug use among study participants by demographic characteristics and drug use history and behavior

Predictor	Odds ratio	95% Confidence limits	*P*-value
Age	0.980	0.938, 1.023	0.348
Being Jingpo	0.698	0.358, 1.359	0.290
Being Han	1.306	0.605, 2.823	0.497
Educational level	1.135	0.803, 1.604	0.475
Household monthly income	1.000	1.000, 1.000	0.391
Internet use	1.323	0.664, 2.635	0.426
Age of drug initiation	**1.088**	**1.029, 1.149**	**0.003**
Number of compulsory detox	**1.289**	**1.028, 1.616**	**0.028**
Main drug use type	1.006	0.878, 1.152	0.930

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CHAPTER V

Summary

The Chinese Methadone Maintenance Treatment Program was initiated eight years ago and has expanded rapidly. By the end of 2011, 623 counties and districts within 28 provinces, autonomous regions, and municipalities had established a total of 738 MMT clinics, providing treatment for a cumulative total of more than 344,000 patients. The total number of patients receiving daily treatment was 140,000 and an average of 190 patients was receiving treatment in each clinic. However, the total number of patients treated daily accounted for less than 20% of all registered opiate users not counting the unregistered drug-using population. The over all coverage and the retention rate of the community-based MMT program are still not at satisfactory levels to make the program more effective.

In this study, a majority of participants was unwilling to initiate MMT enrollment after release, which is of great concern. The reasons cited for unwillingness to take part were: no perceived needs to participate in MMT; misconceptions and lack of MMT-related knowledge; limited accessibility and financial difficulties. Side-effects, inconvenience, dosage and concurrent opiate and stimulant uses were also indicated as reasons for dropping out. The data showed that ethnic disparities existed in this culturally diverse population. Lastly, a high proportion of the study participants reported using stimulants, specifically ephedrine, as their primary drug of choice. This was surprising since drug users in rural areas traditionally used opiates compared to stimulant users who resided in metropolitan areas. Study findings reconfirmed that problems associated with drug addiction are complicated and that the current Chinese drug abuse treatment program needs to be expanded and modified to adapt to the

changing characteristics of drug use. Recommendations for improving Chinese drug abuse treatment, especially the community-based MMT are as follows:

1) Establish a comprehensive Pre-release Relapse Prevention Program inside the compulsory drug detoxification and rehabilitation center to prepare detainees for life after release that includes education and knowledge regarding MMT and stimulant abuse, overdose prevention, and HIV and HCV risk reduction. Currently, detainees are often engaged in long hours of manual labor with only limited treatment related to their drug abuse. For this study population, compulsory drug detoxification centers may be the best place to enhance MMT related education programs and to address misinformation in order to increase MMT enrollment.

2) Expand the current MMT program to include psychological counseling and behavioral modification in order to retain patients and prevent high dropouts. Simply providing a daily methadone oral dose is not enough.

3) Test for non-opiate drugs as part of the urine-monitoring program at MMT clinics since a significant number of the study participants who had been MMT patients were arrested by the public security for stimulant use that was undetectable at clinics.

4) Disseminate and develop stimulant addiction-related educational materials. Graphic images of those suffering from severe psychosis as a result of stimulant abuse should be produced and incorporated into an educational booklet.

5) Take ethnic disparities into consideration and design more culturally appropriate educational programs that include graphic visual aids or videos of role-play to dismiss false claims regarding MMT. Cultural beliefs may be used to enhance learning and simple language should be used to accommodate those with less schooling.

6) Train compulsory drug detoxification and rehabilitation center staff with knowledge of MMT and drug addiction to provide support. In addition, strengthen cooperation between public security and health sectors.

7) Explore interventions and treatments involving family members in drug addiction recovery since family plays an important and unique role in the Chinese society and culture.

8) Expand programs on educating the public regarding MMT based on the successful HIV knowledge campaign established a decade ago and implemented by the Dehong provincial government, which claimed to have increased the general public's HIV knowledge to above 90%. It may be effective to use similar campaign models to achieve comparable results in clearing MMT misinformation and confusion.

There are several limitations that may compromise the generalizability of study findings. This study used a cross-sectional design in one prison setting for the quantitative survey to get a glimpse of the situation inside a compulsory drug detoxification center of a severely affected area. The selection of prison setting was based upon the discretion of local officials as the principal investigator can only do so much with negotiations. It is possible that this particular

detention center had better conditions and healthier detainees. The qualitative portion of this study was conducted in a different compulsory drug detoxification center that housed more severe addicts who were not required to carry out daily manual labor. Discrepancies between these two compulsory detoxification centers may or may not lead to different findings. It is also important to note that all data were self-reported and could potentially be biased.

Another limitation of this study was the length of the questionnaire. The survey was short due to time constraints and limited times of visits allowed for the prison setting. The local authority mandated that the data collection be completed in a week and thus some standardized measurements such as the addiction severity index had to be omitted. Alcohol use was not measured either. This decision was based on the qualitative interviews where most study participants claimed minimal or no alcohol use. But this may just be social desirability bias since participants may have the knowledge that using alcohol has negative effects on MMT and HAART. Less than one-third of study participants reported ever injecting opiates prior to incarceration, which was much lower compared to the literature. This underreporting may also be due to social-desirability bias since most drug users knew unsafe injection behaviors are associated with HIV infection. It is also important to note this study only surveyed incarcerated males.

This study was conducted in Dehong prefecture of Yunnan province, one of the areas severely affected by the HIV epidemic in China. In the last decade, there have been numerous studies and intervention programs conducted in the region and drug users may have higher knowledge of HIV as compared to drug users in other areas of China. Therefore, the study findings are not generalizable and should be interpreted with caution.

The study was originally designed to survey opiate users only. However, the survey found 21.2% respondents reporting stimulants as their primary drug of choice. The original survey questionnaire was not designed to capture the current state of addiction among these stimulant users. Some key information unique to this sub-population may be lost and future studies need to incorporate measurements for both opiate and stimulant users.

Findings from this study, however, can still provide insightful information and practical suggestions to the Chinese MMT Secretariat in Beijing for future policy implications.