

RESEARCH ARTICLE | JANUARY 10 2019

# Description of heroin use during methadone maintenance treatment and analyzation of its related factors **FREE**

Rujia Xie



AIP Conf. Proc. 2058, 020013 (2019)

<https://doi.org/10.1063/1.5085526>



CrossMark

## Articles You May Be Interested In

The spread and characteristics of the reported synthetic opioid and heroin incidents in and between the five states of America

*AIP Conference Proceedings* (June 2019)

A mathematical model of reward-mediated learning in drug addiction

*Chaos* (February 2022)

Studies on effective atomic numbers for photon energy absorption and electron density of some narcotic drugs in the energy range 1 keV-20 MeV

*AIP Conference Proceedings* (April 2013)

500 kHz or 8.5 GHz?  
And all the ranges in between.

Lock-in Amplifiers for your periodic signal measurements



Find out more



# Description of Heroin Use during Methadone Maintenance Treatment and Analyzation of its Related Factors

Rujia Xie<sup>1, a)</sup>

<sup>1</sup>*International Department, the Affiliated High School of SCNU, China.*

<sup>a)</sup>xierj.grace2016@outlook.com

**Abstract.** Objective To explore the occurrence of heroin use during Methadone Maintenance Treatment (MMT), analyze its related factors, and offer plausible plans for decreasing the rate of heroin use. Methods In 2018 June, professional investigators, using a closed questionnaire, conducted one-on-one surveys with 400 patients and collected information such as the general demographic characteristics, drug-use features, family relationships, etc. Binary Logistic Regression Analysis was employed to analyze the related factors of heroin use. Results The rate of heroin use in this research was 41.25% (165/400). Multivariate Logistic regression analysis showed that the factors related to the heroin using rate included unemployment (OR=2.298), residential solitude (OR=1.846), disharmonious family relationships (OR=4.010), and short treatment duration (OR=2.042). Conclusion in Guangdong, China, and the rate of heroin use was still high. The government should strengthen anti-drug education, arrange jobs for MMT patients, and corporate with patients' families. Moreover, the MMT clinics should also elevate the quality in serving the patients.

**Key words:** Methadone, Maintenance Treatment, Heroin Use, Related Factors.

## INTRODUCTION

Methadone Maintenance Treatment (MMT) is a long-term alternative treatment method using methadone. Accompanied by comprehensive measures such as psychological treatment and behavioral intervention, MMT aims to reduce or even eliminate the opioid dependence of drug users until they have the conditions for drug withdrawal [1-3]. Studies show that MMT can effectively reduce drug addicts' drug abuse behaviors, criminal behaviors, high-risk sexual behavior, and the possibility of AIDS and premature death, as well as improve addicts' education level, employment rate, and family relationship [1, 4-8]. Currently, MMT has become the most widely used treatment method for opioid addicts in the world [1, 3, 9]. By the end of 2016, there had been 2.05 million drug addicts in China [10]. The number of people who had not found relapses after three years of abstinence increased to 1.411 million, in which 59,000 people participated in community rehabilitation, such as MMT [10]. Although MMT has been effective in helping many opioid addicts, some of the recipients have been taking opioid drugs during the period of MMT [11]. Studies have shown that the drug abuse rate of patients in Chinese MMT clinics is between 20% and 60% [12-14]. Drug abuse directly affects the therapeutic effect of MMT, destroys abusers' physical and mental health, and causes the occurrence of the high-risk sexual behaviors. These severe consequences subsequently lead to the spread of AIDS and other diseases, triggering a series of problems such as illegal crimes and public security disorders [15, 16].

At present, various domestic and foreign research on drug abuse during MMT shows that the more drug addicts meet the following conditions – namely joblessness [15], dissatisfaction with MMT clinics [15], drug friends temptation [17], low degree of education [18], low MMT daily maintenance dose [19], other substance abuse [9], withdrawal from treatment [20], and no family support [14] – the greater the likelihood of drug abuse will be. Although the studies above have analyzed the reasons for drug abuse during MMT, few of them have focused on the rate of and reasons for drug abuse among patients in MMT clinics of Guangdong, China. Guangdong province has the largest floating population in China [21]. The instability of the floating population renders them lack of education and thus vigilance against drugs [22, 23]. This means that under others' temptation, the floating population is more likely to

take drugs, abuse drugs during MMT, and cause a series of social chaos [22, 23]. Therefore, this paper will analyze the drug abuse rate of methadone curers in Guangdong province, study the reasons behind it, and put forward the basis for reducing the drug abuse rate of methadone curers in Guangdong province, which can improve the social stability of Guangdong province and has a profound impact on the development of Guangdong province.

This study will specifically study the drug abuse rate in MMT outpatients in Guangdong, China, the reasons for drug abuse, and propose the basis for reducing the drug abuse rate according to the factors of drug abuse.

## **SUBJECTS AND METHODS**

### **Research Subjects**

Research subjects: 400 patients who participated in MMT in June 2017.

Inclusion criteria: (1)Above 16 years old; (2)Can express independently; (3)Have signed the informed consent form.

Exclusion criteria: (1)Patients with mental illness; (2)Participate in other methadone investigations; (3)Patients who fail to sign the informed consent form.

### **Research Content**

A self-designed closed questionnaire was used by trained investigators to conduct one-to-one surveys with methadone curers. The survey included (1) general demographic characteristics, such as gender, age, nationality, marriage, occupation, etc. (2) drug abuse characteristics, such as the years of drug abuse, drug abuse method, methadone dose, substance abuse during treatment, drug abuse situation, etc. (3) other characteristics, such as family relationships, social relationships, and living status.

### **Statistical Methods**

In this study, Epi Data 3.1 software was used for data double entry, and SPSS 20.0 was used for data analysis. For measurement data such as age, the mean value  $\pm$  standard deviation was used for statistical description, and the t-test of two independent samples was used for statistical comparison. For the classification data such as gender, education level, nationality, occupation, etc., the frequency was used to describe it, and statistical comparison was carried out with the  $\chi^2$  test. For the analysis of influencing factors of drug abuse, binary classification logistic regression analysis was used. The test level was 0.05, and  $P < 0.05$  was considered statistically significant.

### **Ethics**

This study has been approved by the ethics of the Affiliated High School of South China Normal University.

## **RESULTS**

### **General Demographic Characteristics**

A total of 400 patients with MMT were included in the study, of which 165 had drug abuse during treatment, accounting for 41.25%. Among the included samples in this study, 85.7% were males, 92.5% were Han nationality, 43.5% were under 30 years old, 31% were over 40 years old, 51% were drug addicts who take drugs for over 10 years, 44.8% were unmarried, and 43.5% were with high school or technical secondary school degree. See Table 1 for details.

**TABLE 1.** General Demographic Characteristics

	Number of cases	Percentage (%)
Gender		
Male	343	85.7
Female	57	14.3
Nationality		
Han	370	92.5
Non-han	30	7.5
Age (year)		
<30	174	43.5
30~40	102	25.5
>40	124	31.0
Years of drug abuse (year)		
<5	70	17.5
5~10	126	31.5
>10	204	51.0
Marriage status		
Married	150	37.5
Unmarried	179	44.8
Other	71	17.8
Education level		
Middle school or under	125	31.3
High school or technical secondary school	174	43.5
Junior college or above	101	25.3

### Single Factor Analysis of Drug Abuse

By analyzing and comparing the general demographic characteristics of MMT curers, it is found that the factors influencing the rate of drug abuse in Guangdong, China include gender, years of drug abuse, working status, living status, family relationships, and treatment duration. See Table 2 for details.

### Multi-Factor Analysis of Drug Abuse

By including indicators shown by single factor analysis in multi-factor logistic regression analysis, it is discovered that the drug abuse rate of curers who don't have constant jobs is 2.298 times than that of curers who have constant jobs. The drug abuse rate of curers who live alone is 1.846 times than that of curers who live with family or friends. The drug abuse rate of curers who have normal or bad relationships with family is 1.732 and 4.010 times than that of curers who have good relationships. The drug abuse rate of curers who have less than six months of MMT is 2.042 times than that of curers who have more than six months of MMT. See Table 3 for details.

**TABLE 2.** Single Factor Analysis of Drug Abuse in MMT Curers

	Drug abuse (n=165)	Non- drug abuse(n=235)	$\chi^2$	P
Gender			7.639	0.006
Male	151(44.0)	192(56.0)		
Female	14(24.6)	43(75.4)		
Nationality			2.846	0.092
Han	157(42.4)	213(57.6)		
Non-han	8(26.7)	22(73.3)		
Age (year)			5.312	0.070
<30	82(47.1)	92(52.9)		
30~40	41(40.2)	61(59.8)		
>40	42(33.9)	82(66.1)		
Years of drug abuse			9.378	0.009
<5	19(27.1)	51(72.9)		
5~10	49(38.9)	77(61.1)		
>10	97(47.5)	107(52.5)		
Have a constant job or not			13.466	<0.001
Yes	69(32.7)	142(67.3)		
No	96(50.8)	93(49.2)		
Marriage status			1.468	0.480
Married	62(41.3)	88(58.7)		
Unmarried	78(43.6)	101(56.4)		
Other	25(35.2)	46(64.8)		
Education level			3.729	0.155
Middle school or under	45(36.0)	80(64.0)		
High school or technical secondary school	81(46.6)	93(53.4)		
Junior college or above	39(38.6)	62(61.4)		
Living status			10.707	0.001
Live with family or friends	53(31.7)	114(68.3)		
Live alone	112(48.1)	121(51.9)		
Monthly income			2.217	0.330
<2000	76(42.9)	101(57.1)		
2000~4000	49(36.3)	86(63.7)		
>4000	40(45.5)	48(54.5)		
Family relationships			23.938	<0.001
Good	26(24.8)	79(75.2)		
Normal	43(37.1)	73(62.9)		
Bad	96(53.6)	83(46.4)		
Treatment duration			21.772	<0.001
<6 months	64(60.4)	42(39.6)		
≥6 months	101(34.4)	193(65.6)		
Monthly average therapeutic dose (ml)			1.143	0.285
<30	76(38.6)	121(61.4)		
≥30	89(43.8)	114(56.2)		

**TABLE 3.** Multi-factor Analysis of Drug Abuse in MMT curers

Variation	Estimated value	Standard error	Wald $\chi^2$	P	OR(95%CI)
Constant job No VS Yes	0.832	0.268	6.284	0.012	2.298(1.359,3.88 6)
Treatment time <6 months VS $\geq$ 6 months	0.714	0.201	5.247	0.024	2.042(1.377,3.028)
Family relationships Normal VS Good	0.549	0.233	7.606	0.005	1.732(1.097,2.734)
Bad VS Good	1.389	0.591	28.349	<0.001	4.010(1.259,12.773)
Living status Live alone VS Live with family or friends	0.613	0.204	7.793	0.005	1.846(1.238,2.753)

## DISCUSSION

This study has found that the drug abuse rate in MMT clinics in Guangdong is still high – up to 41.25 percent – and it is urgent to implement intervention programs to reduce the drug abuse rate to maintain social stability. In Guangdong, China, the drug abuse rate is related to gender, years of drug abuse, working status, living status, family relationships and length of treatment. Among them, MMT curers who have long years of drug abuse, no constant jobs, live alone, have normal or bad relationship with family and short treatment time have high drug abuse rate, which is basically consistent with the previous studies of drug abuse during MMT [15, 19, 24].

Through the analysis of related factors of drug abuse, it is found that the longer the years of drug abuse, the higher the drug abuse rate, which was consistent with the research results of Li and Gong. Indeed, for a longer time curers intake drugs, the more severe the disorder of their dopamine and glutamate system at the edge of the middle cerebral cortex is. The severity of the disorder leads to the high level of MMT curers' drug craving [25, 26], and thus the great possibility of drug abuse [27, 28]. Therefore, the government should popularize anti-drug education in the communities so that drug addicts can realize the harm of drugs, start anti-drug treatment as soon as possible, and reduce the years of drug use.

In addition, the study has found that the drug abuse rate is high among the unemployed, which agreed with Gong's research results. This should be attributed to the fact that the unemployed can have more time and energy to spend on drugs [26]. To reduce the drug abuse rate among MMT curers, the government should arrange appropriate work for MMT curers to minimize the energy and time that the curers can touch drugs.

The study has also revealed that the relationship between curers and their families is an important factor affecting drug abuse rate: Curers with good family relationships have low rate of drug abuse. The possible factor of this is that good family relationships increase the frequency of family's financial support to curers, improve curers' physical and mental health status, and promote curers' adherence to cooperative treatment, eventually leading to a reduction of curers' drug abuse rate [9, 14, 29]. Besides, curers living alone have a higher rate of drug abuse than those living with family or friends. The government should promote the curers' families to cooperate with MMT and provide certain spiritual and material support for the curers. Additionally, the government should encourage families to live with curers, to supervise their treatment and thus to prevent them from drug abuse.

Finally, because MMT can effectively reduce patients' craving for drugs, the shorter the treatment time is, the higher the rate of drug abuse is. The research findings of Li and Cao et al. provide a reference for this result [20, 25]. MMT clinics should improve their service quality and reduce curer loss.

Despite the rigorous and scientific investigation and data analysis in this study, survey bias may still occur. Because this study collects data mainly through questionnaire surveys, the research subject will self-report the drug abuse behaviors, which may lead to some selection bias in the investigation process.

## CONCLUSION

In Guangdong, China, the drug abuse rate among MMT curers is still high. The government should increase anti-drug publicity to reduce the years of drug abuse, arrange work for curers to enrich their lives and prevent drug abuse, and encourage family members to support and supervise curers. At the same time, MMT clinics should also improve their satisfaction and service quality for methadone maintenance curers.

## ACKNOWLEDGEMENTS

Thank for the National Natural Science Foundation of China (Item NO.81202257).

## REFERENCES

1. Chen, H., et al., Evaluation and thinking on methadone maintenance treatment in Chongqing municipality. *Modern medical health*, 2016. 32(12): p. 1836-1838.
2. GAO, J., et al. Factors Influencing Compliance to Methadone Maintenance Treatment in Clinic in 369 Heroin Dependent Patients. *Chinese journal of drug dependence*, 2010. 19(01): p. 52-56.
3. Mattick, R.P., et al., Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence. *Cochrane Database of Systematic Reviews*, 2009(3).
4. Xu, S., et al., Analysis of effect of methadone maintenance treatment and AIDS health education among drug addict in compulsory rehabilitation center. *Chinese Journal of Disease Control and Prevention*, 2013. 17(12): p. 1092-1094.
5. Biao, W., et al., The awareness rate on AIDS knowledge of methadone maintenance treatment clients and analysis on its influencing factors in Anhui Province. *Chinese Journal of Disease Control and Prevention*, 2013. 17(04): p. 317-320.
6. Zhang, G., et al., Research progress on the effects of community Methadone Maintenance Treatment in heroin addicts and its influencing factors. *Chinese Preventive Medicine*, 2011. 12(01): p. 136-139.
7. MacArthur, G.J., et al., Interventions to prevent HIV and Hepatitis C in people who inject drugs: a review of reviews to assess evidence of effectiveness. *Int J Drug Policy*, 2014. 25(1): p. 34-52.
8. Degenhardt, L., et al., What has been achieved in HIV prevention, treatment and care for people who inject drugs, 2010-2012? A review of the six highest burden countries. *Int J Drug Policy*, 2014. 25(1): p.53-60.
9. Chen, T., et al., Risk factors associated with polydrug use among clients of methadone maintenance treatment clinics in 3 Chinese provinces. *Chinese Journal of AIDS and STD*, 2012. 18(06): p. 396-399, 404.
10. Shi, Y., China drug control report 2017. 2017.
11. Fareed, A., et al., Effect of Methadone Maintenance Treatment on Heroin Craving, a Literature Review. *Journal of Addictive Diseases*, 2010. 30(1): p. 27-38.
12. Zheng, W. and G. Chen, Investigation on the methadone maintenance treatment in 330 cases and the causes of drug abuse. *Strait Journal of Preventive Medicine*, 2013(05): p. 81-82.
13. Ou, B., et al., Factors associated with illicit drug use among patients during methadone maintenance. *Chinese Journal of Drug Abuse Prevention and Treatment*, 2011. 17(03): p. 145-148.
14. Hoang, T., et al., Factors associated with concurrent heroin use among patients on methadone maintenance treatment in Vietnam: A 24-month retrospective analysis of a nationally representative sample. *International Journal of Drug Policy*, 2018. 55: p. 113-120.
15. Yun, Y., Patients with MMT Outpatient to Steal Suck Heroin Condition and Related Factors Analysis. 2013, Henan University.
16. Tran, B.X., et al., Multilevel predictors of concurrent opioid use during methadone maintenance treatment among drug users with HIV/AIDS. *PLoS One*, 2012. 7(12): p.e51569.
17. Xu, S., et al., Multivariate correspondence analysis of causes of drug abuse in methadone outpatients in Qingshan district, Wuhan. *Chinese Journal of Health Statistics*, 2014. 31(01): p. 161-162.
18. Liao, Y., Methadone maintenance treatment adherence and its influencing factors, 2014, Wuhan University of Science and Technology.
19. Li, M., et al., Five-year retrospective cohort study for methadone maintenance treatment among drug users in Guangxi. *Chinese Journal of Public Health*, 2014. 30(06): p. 697-700.
20. Cao, X., et al., Risk factors which were associated with heroin use during the methadone maintenance treatment among 1301 patients in 9 cities of China. *Chinese journal of epidemiology*, 2010. 31(3): p. 269-272.
21. Zhu, M., D. Zhuang and Y. Yang, the Regional Type of Population Migration and Management Strategy in Guangdong Province since 1990. *Economic geography*, 2018. 38(02): p. 43-50, 65.
22. Duan, C., L. Lv and X. Zou, Major Challenges for China's Floating Population and Policy Suggestions: An Analysis of the 2010 Population Census Data. *Population Research*, 2013. 37(02): p. 17-24.
23. Ma, X., The education status of children of migrant population in China. *Urban Problems*, 2015(04): p. 85-90.

24. Shi, M. and Zhou G., Meta-analysis on the factors influencing dropout from outpatient methadone maintenance treatment among drug addicts in China. *Practical Preventive Medicine*, 2017. 24(11): p. 1397-1400.
25. Li, X., et al., Change and influence factors of craving for patients after 6 month methadone maintenance treatment. *Journal of Central South university (medical edition)*, 2009. 34(08): p. 718-722.
26. Gong, J., et al., Psychological craving and its influence factors in male heroin and methamphetamine addicts. *Journal of Clinical Psychiatry*, 2016. 26(04): p. 231-233.
27. Schnell, T., et al., Craving in patients with schizophrenia and cannabis use disorders. *Can J Psychiatry*, 2013. 58(11): p. 646-9.
28. Welberg, L., and Addiction: craving: a core issue. *Nat Rev Neurosci*, 2013. 14(5): p. 307.
29. Yan, X., et al., The influencing factor of different dimensions of the methadone maintenance treatment for heroin addicts' life quality after treatment. *Modern Preventive Medicine*, 2013. 40(05): p. 875-877.