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Depression, suicidal ideation, and related factors of methadone maintenance treatment users in Guangzhou, China

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Abstract

Mental health problems are prevalent among drug users. Methadone maintenance treatment (MMT) is an evidence-based effective treatment for drug addiction; however, there are few studies investigating depression, suicidal ideation, and their related factors among MMT users. In this cross-sectional study, 648 MMT users were recruited from six MMT clinics in Guangzhou, China. Data were collected through face-to-face interviews by trained interviewers. Of all participants, 270 (42.7%) exhibited probable depression (Depression Subscale of the Chinese short version of Depression, Anxiety, and Stress Scale (DASS-D), score ≥ 10) and 99 (15.3%) reported having suicidal ideation in the last six months. After adjusting for significant socio-demographic characteristics, all studied variables, including drug use history, social support, family support for MMT use, and satisfaction toward MMT services were significantly associated with both probable depression and suicidal ideation in the last six months. Furthermore, depression fully mediated the associations between drug use history, satisfaction toward MMT services, and suicidal ideation. In the final multivariate models, probable depression was associated with social support (OR = 0.88, 95% CI = 0.83–0.93) and satisfaction toward MMT services provided by doctors (OR = 0.59, 95% CI = 0.40–0.86), while for suicidal ideation, social support (OR = 0.85, 95% CI = 0.78–0.92) and probable depression (OR = 5.94, 95% CI = 3.39–10.42) were significant. The findings suggest that

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there are unmet mental health needs among MMT users. For countries with limited resources of psychological services, mental health care toward MMT users should be implanted into current health care settings and incorporate components such as social support, family's understanding of MMT, and service satisfaction.

Keywords

Methadone maintenance treatment; depression suicidal ideation; China

1. Introduction

Methadone maintenance treatment (MMT) is an evidence-based effective treatment for heroin addiction (Joseph, Stancliff, & Langrod, 2000). Provision of daily methadone intake to outpatients can effectively reduce the number of overdose deaths, HIV-related risk behaviors, and can improve users' overall wellbeing (Shi et al., 2007; Van den Brink & Haasen, 2006). China has 1.54 million registered drug users, of which about 70% are heroin users (National Narcotics Control Commission, 2011). By 2013, there were 763 clinics throughout the country, providing service to approximately 0.2 million heroin users (National Narcotics Control Commission, 2014).

Drug dependence is closely associated with mental health problems such as depression and suicide (Pedrelli et al., 2011). Among MMT users, depression (33–55.6%) and suicidal ideation (12.3–34.1%) are still prevalent (Babakhanian, Sadeghi, Mansoori, Alam Mehrjerdi, & Tabatabai, 2012; Peles, Adelson, & Schreiber, 2009). In China, 57.5% of MMT users possessed some depressive symptoms and more than one in four (25.8%) exhibited suicidal ideation (Liang et al., 2008), but psychological services are seldom parts of China's MMT services.

Affirmative findings of factors associated with MMT users' mental health problems may call for services to address such issues. In general, satisfaction of medical services affects patients' mental health status such as depression (Williams & Rheingold, 2014). Few such studies have been conducted among MMT users (Madden, Lea, Bath, & Winstock, 2008) and none have been conducted in China. Other factors of depression among MMT users include education, employment status, social support, and family relationships (Baharudin, Mislán, Ibrahim, Sidi, & Nik Jaafar, 2013; Nyamathi et al., 2012; Wang et al., 2012; Weissman, Slobetz, Prusoff, Mezritz, & Howard, 1976). Such factors were also associated with suicidal ideation as depression is a strong predictor of suicidal ideation (Britton & Conner, 2010). There is a dearth of such studies among MMT users in China.

In this study, we investigated the prevalence of depression and suicidal ideation among MMT users in China. We tested the significance of associations between four groups of factors (socio-demographic characteristics, drug use history, social support, and satisfaction toward MMT services) and two mental health outcomes (depression and suicidal ideation). We also studied whether the effects of factors on suicidal ideation would be mediated by depression.

2. Materials and methods

2.1. Study design

This cross-sectional study was conducted from May to August 2012 in six (four in urban districts and two in rural districts) of the nine (six in urban districts and three in rural districts) MMT clinics in Guangzhou. Participants of the study were current MMT users, at least 18 years old, and gave informed consent to participate in the study. Of all registered MMT users during the study period (about 900), 671 attended the treatment and were invited by trained research assistants to participate in the study under the help of nurses; 656 agreed, and 648 completed the face-to-face interviews.

2.2. Measurements

Information on socio-demographic characteristics and drug use history were collected. Perceived social support was measured by a validated Social Support Scale (Gu et al., 2010). An item was used to assess the level of family support toward participants' MMT use. Three questions on satisfaction toward MMT services were asked. Probable depression was measured by the 7-item Depression Subscale of the Chinese short version of Depression, Anxiety, and Stress Scale (DASS-21) (Chan et al., 2012; Tran, Tran, & Fisher, 2013). The cut-off point of 10 was used to indicate probable (mild to severe) depression. Suicidal ideation was measured by one question: "Have you thought of committing suicide in the last six months?" (Hong, Li, Fang, & Zhao, 2007).

2.3. Statistical methods

The associations between factors and the two outcomes were analyzed by both univariate and adjusted logistic regression models adjusting for socio-demographic variables with $P < .05$. To test the mediation effects of depression on the associations between factors and suicidal ideation, we followed steps proposed by Baron and Kenny (Baron & Kenny, 1986). If factors of suicidal ideation lose significance after adjusting for depression, the factors' effects on suicidal ideation have been fully mediated by depression. Two final models were fit for depression and suicidal ideation, using all variables with $P < .05$ as candidates, adjusting for socio-demographic variables with $P < .05$. SPSS for Windows Version 20.0 was used for data analyses.

3. Results

Characteristics of all participants were summarized in Table 1. Nearly 43% exhibited probable depression; 15.3% reported having suicidal ideation in the last six months. Among socio-demographic characteristics, age (univariate odds ratio (OR_u) = 1.03, 95% confidence interval (CI) = 1.01–1.05), and current employment status (employed vs. unemployed; OR_u = 0.47, 95% CI = 0.34–0.65) were associated with probable depression, while marital status (divorced vs. single; OR_u = 2.30, 95% CI = 1.28–4.14) was associated with suicidal ideation (data not tabulated). The associations between factors and the two outcomes before and after adjusting for socio-demographic variables are shown in Table 2.

Adjusting for depression, perceived social support and family support for MMT use remained significantly associated with suicidal ideation, but the ORs became closer to 1.0 (last two columns of Table 2). The associations between the two variables and suicidal ideation had been partially mediated by depression. In contrast, the associations between the number of times of compulsory drug detoxification, overall satisfaction toward MMT services, and suicidal ideation had been fully mediated by depression.

In the final models, number of times of compulsory drug detoxification (multivariate OR (OR_m) = 2.11, 95% CI = 1.29–3.46), Social Support (OR_m = 0.88, 95% CI = 0.83–0.93), and satisfaction of services provided by doctors (OR_m = 0.59, 95% CI = 0.40–0.86) were significantly associated with probable depression. For suicidal ideation, identified factors included age of first drug use (OR_m = 0.37, 95% CI = 0.16–0.84), social support (OR_m = 0.85, 95% CI = 0.78–0.92), and probable depression (OR_m = 5.94, 95% CI = 3.39–10.42) (data not tabulated).

4. Discussion

Mental health problems are common among MMT users, but often remain unrecognized and untreated (Pud, Zlotnick, & Lawental, 2012). Although the National Working Group for Community-based MMT in China required MMT clinics to provide psycho-social interventions to their clients, such services are still underdeveloped, due to lacking of manpower in MMT clinics, insufficient psychological counseling training for front-line MMT staff, and the absence of mental health referral services (Xiang, Yu, Sartorius, Ungvari, & Chiu, 2012). In consideration of both service needs and the weaknesses inherent in the system, innovative interventions which can be provided by current health workers without professional psychological skills (e.g., positive psychological intervention) should be investigated (Seligman, Steen, Park, & Peterson, 2005). The linkage between MMT and other services should also be strengthened by connecting other service sectors (such as social workers) to MMT users instead of relying solely on medical staff (Gu, Lau, et al., 2013).

Our study also provided insights into key components that should be included in the design of future psychological services targeting MMT users. Social support was independently associated with depression; both social support and family support for MMT directly affected suicidal ideation. Psychological services should take measures to increase family connection, acceptance, and support (Gu, Bai, et al., 2014). Service satisfaction was negatively associated with depression, while service satisfaction is affected by client perceptions towards the services (Perez de los Cobos et al., 2004) and the empathy of clinicians (van Ryn & Fu, 2003). Measures from both the clients and service providers should be taken to improve service satisfaction. The number of times one received compulsory detoxification was positively associated with depression. It could be explained that those who received more compulsory detoxification may have severer drug dependence (Sun, Li, Li, Wang, & Wang, 2009), while drug dependence leads to depression (Applebaum et al., 2010). MMT users who have received more compulsory detoxification may be prioritized when there are available psychological services.

Findings of the mediation effects of depression on the associations between factors and suicidal ideation contributed to a better understanding of suicidal thoughts among MMT users. Studies of suicide in the Chinese general population reported that adverse life events are important predictors of suicidal ideation, while in other countries, suicide is more related to depression (Chen & Yip, 2008; Jin et al., 2013). Our findings supported previous Chinese studies that adverse life events, such as lack of social support, have direct effects on suicide. These findings imply that in order to prevent suicide, both depression and social support should be addressed.

Our study has some limitations. First, participants were current MMT users and recruited from one city, which may limit the generalizability of the findings. Second, the study was a cross-sectional design, so causal relationships were not able to be established. Third, we did not include treatment dosage which may also be related to mental health status.

In summary, there are unmet mental health needs among MMT users. Psychological intervention efforts should include components such as social support, family understanding of MMT, and service satisfaction. As there are limited psychological service resources in China, mental health care needs to be implanted into existing health care settings. Further efforts are needed to design, evaluate, and implement such comprehensive health care packages for MMT users.

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Table 1Profiles of all participants ($n = 648$).

	<i>n</i>	%
<i>Socio-demographic characteristics</i>		
Sex		
Male	574	89.1
Female	70	10.9
Age group (range from 22 to 78 years)		
<35	91	14.2
35–	346	54.0
45–	204	31.8
Ethnicity		
Han	643	99.4
Other	4	0.6
Education level		
Primary or below	140	21.6
Junior high	357	55.2
Senior high or above	150	23.2
Current marital status		
Single	205	31.8
Married/cohabitating	346	53.7
Divorced/other	93	14.5
Current employment status		
Unemployed	341	52.7
Employed	306	47.3
<i>Drug use history</i>		
Age of first drug use		
<21	219	34.0
21–	326	50.5
31–	100	15.5
Duration of drug use (years)		
<11	94	14.7
11–	354	55.3
21–	192	30.0
Number of times of compulsory drug detoxification		
0	116	18.2
1–2	356	55.7
3~	167	26.1
<i>Perceived social support (10.24±3.18)^a</i>		
Physical support from family members		
No support/little support	189	29.2
Some support/much support	459	70.8

	<i>n</i>	%
Physical support from friends		
No support/little support	426	65.7
Some support/much support	222	34.3
Psychological support from family members		
No support/little support	245	37.8
Some support/much support	403	62.2
Psychological support from friends		
No support/little support	362	55.9
Some support/much support	286	44.1
<i>Family support for MMT use</i>		
How much does your family support your MMT use?		
Extremely unsupportive/unsupportive/do not know	137	21.4
Supportive/extremely supportive	504	78.6
<i>Satisfaction toward MMT services</i>		
Are you satisfied with MMT services provided by doctors?		
Extremely unsatisfied/unsatisfied/do not know	190	29.5
Satisfied/extremely satisfied	455	70.5
How do MMT services meet your needs?		
Totally unmet/somewhat unmet/do not know	110	17.2
Somewhat met/totally met	529	82.8
Overall, are you satisfied with current MMT services?		
Extremely unsatisfied/unsatisfied/do not know	119	18.4
Satisfied/extremely satisfied	527	81.6
<i>Psychological problems</i>		
<i>Depression^{b,c}</i>		
Not probable depression (DASS-D < 10)	363	57.3
Probable depression (mild depression and above) (DASS- D = 10)	270	42.7
<i>Suicidal ideation in the last six months</i>		
No	549	84.7
Yes	99	15.3

^aCronbach's alpha of the Social Support Scale = 0.80.

^bCronbach's alpha of the 7-item Depression Subscale = 0.87.

^cThe prevalence of mild, moderate, severe, and extremely severe depression was 10.9%, 20.9%, 5.8%, and 5.1%, respectively.

Table 2

Factors associated with probable depression and suicidal ideation.

	Probable depression			Suicidal ideation (last six months)		
	%	OR _n (95% CI)	†† OR _n (95% CI)	%	OR _n (95% CI)	†† OR _n (95% CI)
<i>Drug use history</i>						
<i>Age of first drug use</i>						
<21	45.3	NS	NS	19.2	1.00	NS
21–	40.6			14.1	0.69 (0.44–1.10)	0.66 (0.41–1.06) [†]
31–	42.7			11.0	0.52 (0.26–1.06) [†]	0.49 (0.24–1.02) [†]
<i>Duration of drug use (years)</i>						
<11	28.6	1.00	1.00	8.5	1.00	NS
11–	46.4	2.16 (1.31–3.57) ^{**}	1.95 (1.17–3.26) [*]	16.1	2.06 (0.95–4.49) [†]	
21–	43.1	1.89 (1.10–3.24) [*]	1.51 (0.86–2.63)	17.7	2.31 (1.03–5.22) [*]	
<i>Number of times of compulsory drug detoxification</i>						
0	29.2	1.00	1.00	8.6	1.00	NS
1–2	47.0	2.15 (1.36–3.39) ^{**}	2.09 (1.31–3.34) ^{**}	17.1	2.19 (1.08–4.43) [*]	2.44 (1.16–5.13) [*]
3–	42.4	1.79 (1.07–2.97) [*]	1.59 (0.94–2.68) [†]	16.8	2.14 (0.99–4.59) [†]	2.30 (1.03–5.14) [*]
<i>Perceived social support</i>						
<i>Physical support from family members</i>						
No support/little support	53.8	1.00	1.00	28.0	1.00	1.00
Some support/much support	38.1	0.53 (0.37–0.75) ^{***}	0.59 (0.41–0.85) ^{**}	10.0	0.29 (0.18–0.44) ^{***}	0.31 (0.20–0.49) ^{***}
<i>Physical support from friends</i>						
No support/little support	46.9	1.00	1.00	19.0	1.00	1.00
Some support/much support	34.7	0.60 (0.43–0.85) ^{**}	0.66 (0.47–0.94) [*]	8.1	0.38 (0.22–0.64) ^{***}	0.42 (0.24–0.72) ^{***}
<i>Psychological support from family members</i>						
No support/little support	56.7	1.00	1.00	25.7	1.00	1.00
Some support/much support	34.2	0.40 (0.29–0.55) ^{***}	0.43 (0.31–0.61) ^{**}	8.9	0.28 (0.18–0.44) ^{***}	0.29 (0.18–0.46) ^{***}
<i>Psychological support from friends</i>						
No support/little support	50.8	1.00	1.00	20.7	1.00	1.00

	Probable depression			Suicidal ideation (last six months)		
	%	OR _u (95% CI)	^{††} OR _a (95% CI)	%	OR _u (95% CI)	^{††} OR _a (95% CI)
Some support/much support	32.3	0.46 (0.33–0.64) ***	0.50 (0.36–0.70) ***	8.4	0.35 (0.22–0.57) ***	0.38 (0.23–0.62) ***
Total score of the Social Support Scale	NA	0.87 (0.82–0.91) ***	0.88 (0.84–0.93) ***	NA	0.80 (0.75–0.86) ***	0.81 (0.76–0.88) ***
<i>Family support for MMT use</i>						
How much does your family supports your MMT use?						
Extremely unsupportive/unsupportive/do not know	54.8	1.00	1.00	24.8	1.00	1.00
Supportive/extremely supportive	39.7	0.54 (0.37–0.80) **	0.55 (0.37–0.81) **	12.5	0.43 (0.27–0.69) ***	0.44 (0.27–0.71) **
<i>Satisfaction toward MMT services</i>						
Are you satisfied with MMT services provided by doctors?						
Extremely unsatisfied/unsatisfied/do not know	54.5	1.00	1.00	19.5	1.00	1.00
Satisfied/extremely satisfied	37.6	0.50 (0.36–0.71) ***	0.55 (0.38–0.78) **	13.4	0.64 (0.41–1.00) [†]	0.64 (0.40–1.01) [†]
How do MMT services meet your needs?						
Totally unmet/somewhat unmet/do not know	57.3	1.00	1.00	20.9	1.00	1.00
Somewhat met/totally met	39.5	0.49 (0.32–0.74) **	0.52 (0.34–0.80) **	14.2	0.63 (0.37–1.05) [†]	0.63 (0.37–1.05) [†]
Overall, are you satisfied with current MMT services?						
Extremely unsatisfied/unsatisfied/do not know	55.9	1.00	1.00	21.8	1.00	1.00
Satisfied/extremely satisfied	39.5	0.51 (0.34–0.77) **	0.53 (0.35–0.81) **	13.7	0.57 (0.34–0.93) *	0.58 (0.35–0.98) *
<i>Depression</i>						
Not probable depression	NA	NA	NA	6.1	1.00	1.00
Probable depression (mild depression and above)				28.1	6.07 (3.66–10.1) ***	6.31 (3.72–10.69) ***

OR_u: Odds ratios of univariate logistic regression models. NA: Not applicable. NS: Not significant.

[†]OR_a: Odds ratios of adjusted logistic regression models, adjusting for socio-demographic variables with $P < .05$ (age, current employment status).

[†]OR_a: Odds ratios of adjusted logistic regression models, adjusting for socio-demographic variables with $P < .05$ (marital status).

^{††}OR_a: Odds ratios of adjusted logistic regression models, adjusting for depression and socio-demographic variables with $P < .05$ (marital status).

[†] $P < .1$

* $P < .05$

** $P < .01$

$P < .001$

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