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An intervention trial targeting methadone maintenance treatment providers to improve clients' treatment retention in China

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Abstract

Background: Service providers including doctors, nurses, and other healthcare professionals play an essential role in methadone maintenance treatment (MMT). This study evaluated the impact of an intervention targeting MMT providers on their clients' treatment retention.

Methods: This study was conducted in 68 MMT clinics in five provinces of China with 36 clients randomly selected from each clinic. The clinics were randomized to intervention or control condition. The MMT CARE intervention started with group sessions to enhance providers' communication skills. The trained providers were encouraged to conduct individual sessions with clients to promote treatment engagement. The outcomes, which include client retention (main outcome) and their reception of provider-delivered individual sessions (process outcome), were measured over a 24-month period.

Results: Significantly fewer intervention clients dropped out from MMT than control clients during the study period (31% vs. 41%; $p < 0.0001$). Dropout hazard was significantly lower in the intervention condition compared to the control condition (HR = 0.71, 95% CI: 0.57, 0.89). More intervention clients had individual sessions than control clients (93% vs. 70%; $p < 0.0001$). Having individual sessions was associated with a significantly lower dropout hazard (HR = 0.30, 95% CI: 0.23, 0.40). The intervention clients had a significantly lower dropout hazard than the control clients if they started the individual sessions during the first six months (HR = 0.68, 95% CI: 0.51, 0.90).

Conclusions: The MMT CARE intervention focusing on provider capacity building has demonstrated efficacy in reducing clients' treatment dropout. This study sheds light on MMT service improvement in China and other global community-based harm reduction programs.

Keywords

Methadone maintenance treatment; Service providers; Randomized controlled trial; Treatment retention

1. Introduction

Methadone has been widely used as an effective opioid substitution to combat both drug addiction and HIV infection (Karki et al., 2016; Wu and Clark, 2013; MacArthur et al., 2012; Mathers et al., 2009; WHO, 2009). Satisfactory outcomes of methadone maintenance treatment (MMT) are highly dependent upon treatment compliance (Caplehorn et al., 1994; Ward et al., 1999). However, client dropout is common and presents a significant challenge to MMT programs worldwide (Feelemyer et al., 2014; Lambdin et al., 2014; Proctor et al., 2015; Soyka et al., 2008), including in China (Cao et al., 2013; Sun et al., 2015; Yin et al., 2010; Zhou and Zhuang, 2014). China started its national MMT program in 2004 and rapidly expanded it to 767 MMT clinics across 28 provinces to serve over 184,000 clients by the end of 2014 (National Health and Family Planning Commission of the People's Republic of China, 2015; Pang et al., 2007). One-year MMT retention rates in China ranged from 30% to 86%, and most dropouts occurred within the first 12 months of the treatment (Cao et al., 2014; National Health and Family Planning Commission of the People's Republic of China, 2015; Zhou and Zhuang, 2014).

Several factors have been identified as being associated with attrition from MMT in the literature. For instance, a lower methadone dosage is correlated with a higher possibility of dropout (Peles et al., 2006; Sarasvita et al., 2012). Mental health problems and concurrent use of heroin and other psychoactive drugs could also increase the likelihood of treatment termination (Hersh et al., 2014; Li et al., 2012a; Wang et al., 2015; Yin et al., 2015). In addition, lack of comprehensive services, including psychological counseling, social/employment assistance, and behavioral intervention may also contribute to the high dropout rates (Lin et al., 2010b; Pan et al., 2015). Therefore, effective interventions are urgently needed to improve MMT clients' treatment retention and the effectiveness of the MMT programs.

Globally, there have been interventions developed and implemented to tackle the challenges related to MMT dropout, most of which targeted MMT clients directly (Chawarski et al., 2011; Hser et al., 2014; Pan et al., 2015; Schwartz et al., 2017). Service providers, who play a critical role in treatment success, were usually ignored or under-addressed (Chen et al., 2013; Jauffret-Roustide et al., 2012). Previous studies have found that positive provider-client interaction could substantially enhance clients' medication adherence and treatment out comes (Flickinger et al., 2013; Lam et al., 2016; Nachega et al., 2012; Li et al., 2012b). However, the Chinese MMT programs are facing personnel shortage and insufficient credentials of service providers (Lin et al., 2010a). According to the national MMT policy,

each MMT clinic is required to have at least two physicians certified to prescribe analgesic and psychotropic drugs and two nurses with HIV or mental health-related training (Ministry of Health of China et al., 2006). Nevertheless, these staffing requirements are often not met, and clinics equipped with full-time professional counselors are scarce (Han et al., 2010). Due to inadequate training, MMT providers mainly take the responsibilities of dispensing medication and administering laboratory testing (Lin et al., 2010a). Psychological counseling and behavioral interventions offered in clinics are often minimal and vary in quality, which contributes to the clients' treatment dropout (Lin et al., 2010b; Pan et al., 2015). To reconcile the gap between client's needs and a shortage of specialized professionals, our research team developed an intervention, entitled MMT CARE, to equip MMT providers with simple yet effective communication skills and tools to provide necessary client support. The intervention, which fell within the World Health Organization's (2008) task-shifting paradigm to expand access to services, was previously pilot tested and demonstrated promising client outcomes (Li et al., 2013). Based on the pilot, we implemented a full-scale trial to test the efficacy of the MMT CARE intervention on client treatment retention.

2. Methods

2.1. Study design

The study was conducted from September 2012 to September 2015 in five Chinese provinces (Sichuan, Guangdong, Shanxi, Jiangsu, and Hunan) that vary in geographic, social, economic, and drug use conditions. We randomly selected 68 of the 110 MMT clinics in the five provinces that had more than 80 current clients. Using a cluster randomized trial (CRT) design, the chosen clinics within each province were matched into pairs based on the current client number and the clinic affiliation (hospital-affiliated vs. CDC-affiliated), yielding 34 pairs of clinics. After the baseline assessment, the two clinics in each pair were randomized to either an intervention or a control condition using SAS PROC PLAN procedure (SAS Institute Inc., 2015). To avoid potential contamination, we made efforts to ensure that the clinics were located in different cities and counties and the participants in the two conditions were geographically isolated from each other.

2.2. Participant recruitment

To be eligible for MMT in China, a person must 1) be at least 20 years old, 2) have opiate dependence, 3) not be under criminal or civil charges, and 4) have no severe psychosis or neurological damage (Ministry of Health of China et al., 2006). This study included 36 current MMT clients from each clinic using a systematic sampling approach (Levy and Lemeshow, 2008). Each clinic provided a listing of all current clients (indexed by their enrollment dates). The sampling interval was then determined by dividing the number of current clients in the clinic by the needed number of clients. For example, a clinic had 110 current clients, and 36 clients per clinic were needed; thus, every third client (i.e., 110/36) was selected based on the index until the required sample size was reached for the clinic. Selected participants were approached during their daily visit at the MMT clinics. A study recruiter verbally explained the study purpose, procedure, risks and benefits, and voluntary participation to the clients using a printed flyer. The study was approved by the Institutional

Review Board (IRB) of the participating institutes in the USA and China. A total of 2448 clients were recruited in the study, and the refusal rate was less than 5%.

2.3. Intervention

All medical providers in the intervention clinics, totaling 212 members, participated in the intervention activities. Among them, 75 (35%) were doctors, 65 (36%) were nurses, and the rest were pharmacists or counselors. The average years of education were 14.2 years (SD = 2), and the average duration of service in the MMT clinic was 3.6 years (SD = 2). The intervention activities excluded supporting staff (cleaners, accountants, and security personnel) since they did not provide direct medical services for clients. The intervention consisted of two linked parts: 1) group training sessions with service providers and 2) individual sessions delivered by trained providers to their clients. Three group training sessions, each approximately 90 min in length, were delivered in three consecutive weeks. The themes of the group sessions were: 1) standardizing MMT protocol and improving provider-client relationships, 2) introducing effective communication skills and tools, and 3) applying the newly acquired skills and tools in client engagements to enhance treatment adherence. Guided by the Transtheoretical Model of Change (Prochaska and Velicer, 1997), the intervention incorporated concept and simplified methods of motivational interviewing (Miller and Rollnick, 2012). Communication skills taught in these group sessions included reflective listening, rolling with resistance, and issue reframing. Several simple tools were introduced during the group sessions. For example, a motivational ruler was demonstrated to encourage positive behavioral changes for clients, and a decisional balance sheet was used to help providers guide their clients to make client-centered decisions. Each provider practiced the skills and tools through interactive activities, such as pair share, role-play, and group discussions. The participation in the group sessions was higher than 95%.

After the initial group sessions, trained providers were given assignments to conduct individual sessions with their clients. The individual sessions centered on enhancing clients' motivation to make a positive behavioral change and engaging them in long-term maintenance treatment. The providers were encouraged to apply the skills and tools acquired from the group sessions into their individual sessions with clients. The intervention providers received a user-friendly diary to document the date, location, target client, and contents of the individual sessions. Reunions were conducted among trained providers to reinforce the effort and foster continued capacity building. The reunion sessions, which lasted approximately one hour each, were delivered once every two months during the first year and once every four months during the second year. Guided by the facilitator, participating providers shared their experiences, discussed challenges, and identified solutions. Verbal praise and simple gifts were given to those who successfully delivered individual sessions, and all providers were encouraged to continue their effort on individual sessions.

2.4. Control condition

The MMT service providers in the control condition continued to receive periodic training from the Chinese National MMT Working Group. In addition, our intervention team delivered a one-time group session in a didactic lecture style which emphasized the

importance of appropriate methadone dosage and reviewed protocol for treating methadone overdose.

2.5. Data collection

The intervention outcomes of the study were evaluated using data collected at baseline, every three months for the first six months, and every six months thereafter until 24 months. At each assessment, the participating clients were surveyed individually in a private room at the participating clinics. The computer-assisted personal interview method was utilized to administer the questionnaire, in which trained interviewers read questions to the participants and recorded their responses on computers. Each assessment took approximately 45–60 min, and each participant received 30 RMB (approximately 5 USD) for their participation. Fig. 1 shows the follow-up rates at each follow-up visit.

2.6. Study outcomes

The primary outcome of the study was clients' MMT retention. Dropout from MMT was defined as not attending the MMT clinic for 14 consecutive days based on the clinic's records (Zhang et al., 2015). The primary interest of the study was the time to the first dropout from the MMT clinic, which was defined as the number of months from baseline to the first reported date of MMT dropout. Data for clients who did not drop out from the MMT or who died were censored at the date of the last available follow-up. The process outcome was client's self-reported reception of individual sessions from the MMT providers during the last follow-up period.

2.7. Covariates

2.7.1 Demographic and background characteristics—Demographic characteristics including age, gender, education, marital status, and monthly household income were collected. Other background information, including years of heroin use, years attending MMT, and HIV status, was self-reported by the participants.

2.7.2. Depressive symptoms—Participants' depressive symptoms were assessed at baseline using a brief version of Zung's Self-Rating Depression Scale (Zung, 1965). This scale was previously validated in the pilot study (Li et al., 2013). The participants were asked to rate how often they experienced nine different situations (such as "I get tired for no reason" and "I am more irritable than usual") from "1=a little of the time" to "4=most of the time." After the positively worded items were reverse-coded, an overall score was constructed by summing all items (range: 9–36). A higher score indicated a higher level of depressive symptoms ($\alpha = 0.75$).

2.8. Data analyses

Sample size of the study was determined based on the CRT design and the primary outcome: clients' MMT dropout (binary). To account for the CRT design and an attrition rate up to 20% at the end of the study, we enrolled a total of 1224 clients per condition (36 clients per clinic x 34 clinics) to provide at least 80% power at 5% level of significance to detect a minimum difference of 9% in this outcome between control and intervention using a two-

sided Z test with pooled variance. The calculation assumed that (1) the anticipated percentage of MMT dropout for the control condition was 40%, and (2) an intraclass correlation was 0.02. In the fieldwork stage, we were able to collect additional date information regarding MMT dropout for individual clients; thus, we treated the MMT retention as a time-to-event outcome in the analyses.

All statistical analyses were conducted using the SAS System for Windows 9.4 (Statistical Analysis Software, Cary, NC). Descriptive statistics and frequencies of demographic and background characteristics were summarized by intervention condition. Continuous and categorical characteristics were compared between the intervention and control conditions using linear and logistic random-effects models with appropriate link functions, respectively.

The primary outcome, MMT retention, was examined using the Kaplan-Meier method, the Kaplan-Meier curves were plotted, and the reasons for MMT dropout were summarized. Next, a multivariable Cox proportional hazard (CoxPH) regression model was used to assess the intervention effect on MMT dropout during the study period (main model). Covariates included demographic and other background characteristics, HIV status, and baseline depressive symptoms. A robust sandwich variance estimate was used to account for the intra-cluster dependence, i.e., clustering of clients within clinics (Lee et al., 1992; Lin, 1994). In addition, the proportional-hazards assumption that the effect of a covariate on the hazard is constant in time was tested. Hazard ratios and 95% confidence intervals of all the parameters are presented.

For the process outcome, the percentages of clients who had at least one individual session with their providers after baseline were summarized and compared between the intervention and control conditions. The timing of receiving the initial individual session with MMT provider post-baseline was also of interest. The clients were further classified into three categories: those who did not receive any individual sessions (none), those who received initial individual sessions during the first 6-month follow-up (early-period), and those who received initial individual sessions after 6-month follow-up (late-period).

Two separate exploratory analyses were conducted. The first exploratory analysis was performed to examine whether having any individual sessions (yes or no) was significantly associated with a lower dropout hazard using a CoxPH regression model. The second exploratory analysis was to further evaluate whether the timing of receiving an initial individual session may influence the intervention effect on retention in MMT and, among those who reported having individual sessions with providers during their first 6-month follow-up, whether intervention clients had a significantly lower dropout hazard compared to those in the control condition. To do this, the timing of the initial individual session (none, early-, and late-period) and a 2-way interaction term of the timing-by-intervention condition were added to the main model; the intervention effect was estimated using model contrasts.

3. Results

3.1. Baseline demographic and background characteristics

Table 1 shows the demographic and baseline characteristics by intervention condition. Almost 80% of the client participants were male, and the average age was approximately 40 years (SD = 7). The clients on average had around nine years of education, and 85% had a junior high education or higher. More than half (56%) were married or living as married, and the average monthly household income was 5335 RMB (approximately 787 USD). The participants reported having used heroin for an average of 15 years (SD = 6). The mean duration of MMT attendance was 3.6 years (SD = 2). Less than 4% of the clients were HIV-positive. No significant differences in any of these characteristics between the intervention and control conditions were observed.

3.2. Intervention effect on MMT client retention

A total of 885 (36%) clients had dropped out from MMT by the end of the study. Among them, the reported reasons included lost contact (32%), being incarcerated (28%), being contacted but not coming to the clinic (8%), and self-withdrawal from the treatment (6%). Fig. 2 presents the Kaplan-Meier retention curve of each intervention condition. The median time to the first MMT dropout was not reached at the last study visit. By the end of the study, 383 (31%) intervention clients and 502 (41%) controlclientsdroppedoutfromMMT(log-rank p < 0.0001).

Table 2 summarizes the results of the multivariable CoxPH regression analysis. Results from the adjusted analysis indicated the intervention condition had a significantly lower MMT dropout hazard than the control (HR = 0.71, 95% CI: 0.57, 0.89). Clients with less than 10 years of education had a significantly higher dropout hazard than those who had 10 or more years of education (range of HR: 1.24–1.30, p-values < 0.02). A significantly higher dropout hazard was observed for clients who had used heroin for ten years or less than those who had used heroin for more than 20 years (HR = 1.40, 95% CI: 1.10, 1.78). A higher level of depressive symptoms was significantly associated with a greater dropout hazard (HR = 1.02, 95% CI: 1.01, 1.03). Clients who attended MMT for one year or less had an increased dropout hazard as compared to those who had attended MMT for more than five years (HR = 1.34, 95% CI: 1.04, 1.73). We further performed a subgroup analysis of clients who attended MMT for one year or less (N = 324, 13%) and found a significantly lower percentage of dropout among intervention clients compared to the control clients (40% vs. 53%, respectively; p = 0.019). However, no significant difference in time to dropout was observed between intervention and control conditions (HR = 0.69, 95% CI: 0.45, 1.06).

3.3. Intervention effect on having individual sessions

At the baseline, approximately 45% and 44% of the participants in the control and intervention conditions reported having received individual sessions from the MMT providers in the past 6 months, respectively. Overall, more clients in the intervention condition than in the control condition reported having received individual sessions from their MMT providers during the study (93% vs. 70%, respectively; p < 0.0001). Fig. 3 displays the timing of receiving the initial individual session by intervention condition. The

majority of the clients (N = 1702, 70%) reported having their initial individual sessions from the MMT providers during the first 6 months of follow-up (early-period group), but about 12% (N = 292) of the clients started their individual sessions after 6-month follow-up (late-period group). The timing of receiving an initial individual session from MMT providers differed between intervention and control (p < 0.0001). Fifty-two percent of the control clients versus 87% of the intervention clients indicated that they received their initial individual sessions prior to the 6-month follow-up. However, 17% of clients in the control condition compared with less than 7% of clients in the intervention condition reported receiving their initial individual sessions after 6-month follow-up.

3.4. Exploratory analyses

Results from the exploratory analyses indicated that receiving any individual sessions was associated with a significantly lower dropout hazard (HR = 0.30, 95% CI: 0.23, 0.40). In addition, compared to having no individual sessions during the study (none), having any early-period individual sessions was associated with a significantly decreased dropout hazard in both the control (HR = 0.50, 95% CI: 0.35, 0.71) and intervention conditions (HR = 0.16, 95% CI: 0.10, 0.26). A similar finding was observed for clients who had late-period sessions versus none (hazard ratio of MMT dropout: 0.12 (95% CI: 0.08, 0.21) for control versus 0.08 (95% CI: 0.05, 0.13) for intervention).

The intervention effect on retention varied for clients with early-period individual sessions versus late-period sessions (i.e., a significant timing-by-intervention condition interaction wasobserved, p = 0.0004). Among clients who reported late-period sessions, no significant difference in time to MMT dropout between the intervention and control conditions was observed. However, intervention clients had a significantly lower dropout hazard than control clients did if they had an early-period individual session (HR = 0.68, 95% CI: 0.51, 0.90).

4. Discussion

The study demonstrated the efficacy of the MMT CARE intervention in reducing client dropouts. Instead of directly targeting the client population, this intervention focused on building the capacity of MMT providers for their routine work. The idea of task-shifting promoted by the World Health Organization (World AIDS Organization, 2008) guided us to empower the available human resources in resource-constrained MMT settings. Many MMT clinics in China did not have certified psychological counselors in-house due to labor issues such as low salaries and lack of career opportunities (Lin et al., 2010a). As a result, individual counseling sessions were not always available or accessible to MMT clients in China (Li et al., 2013). A vital component of the MMT CARE intervention was to equip existing service providers with necessary skills and support to conduct individual sessions with their clients. By the end of the study, we observed a higher percentage of intervention clients having received individual sessions than those in the control condition. The study suggests that service providers could go beyond their job duty of prescribing and dispensing methadone liquid and be mobilized to deliver regular individual sessions for their clients. The enhanced providers' working capacity may have resulted in the improvement of clients'

treatment retention, and the findings confirmed that it is feasible to train providers as critical links to address clients' individual treatment needs (Jauffret-Roustide et al., 2012; Li et al., 2012b).

This study has implications for manpower training of MMT programs. The current MMT provider training in China primarily focuses on the pharmacological model of MMT and related policies, while client engagement and communication have not received adequate emphasis (Yunnan Institute for Drug Abuse, 2017). Insufficient communication with clients may lead to a sub-optimal quality of service and undesirable treatment outcomes (Joe et al., 2001; Li et al., 2017). In the MMT CARE intervention training, the provider-client relationship and communication were addressed in the client-centered framework, with communication skills and tools taught and practiced to assist clients in making informed decisions. These skills and tools were well accepted by the trained providers because they are easy to grasp and can be immediately applied to their routine practices. This intervention model should be incorporated into the current MMT providers' training curriculum and performance evaluation. Trained providers need to deliver individual sessions to their clients in a timely manner to lower the risk of client dropout from the treatment.

Notably, there were some intervention clients who reported not receiving any individual sessions during the study period, implying that some providers in the intervention clinics might not have followed the instructions. Our observation highlights the importance of addressing interventionimplementation and monitoring issuesin intervention delivery. However, monitoring the completion of individual session activitiesisexceptionallychallenging,andproviders'self-reports during the reunions may not be accurate and were subject to social desirability.Futureinterventionprograms,especiallyinterventions with multiple target populations, should pay more attention to these implementation issues and identify the challenges associated with delivering individual sessions to clients. Nonetheless, the intervention providers might have imperceptibly used the newly acquired communication skills in their daily contact with the clients, although it might not be in a format of the individual session as required by the project.

In addition to intervention outcome findings, we also identified that using heroin for ten years or less and having a higher level of depressive symptoms were negatively associated with client retention. The results are consistent with those of previous studies indicating the relationship between drug use history and treatment dropout (Wei et al., 2013) and the relationship between mental health problems, such as depressive symptoms, and MMT retention (Jiao et al., 2017; Yin et al., 2015). Future service provider training should address these factors and provide adequate instruction on the adaptation of the treatment programs to meet the needs of clients with different characteristics.

There are limitations associated with this study. First, the study included only large MMT clinics with more than 80 current clients; thus, the results might not be generalizable to clinics with fewer clients. Second, some of the measures used in this study, such as attendance at individual sessions, relied entirely on the self-reports of the clients, and issues related to recall bias and social-desirability bias could be raised.

5. Conclusions

This study reported on the efficacy of the MMT CARE intervention in improving clients' treatment retention. Compared to the traditional behavioral interventions that directly target MMT clients, this intervention with capacity building components is feasible and likely to achieve anticipated outcomes. The intervention can serve as an essential complement to the current MMT service providers training in China and can benefit global community-based harm reduction programs.

Acknowledgements

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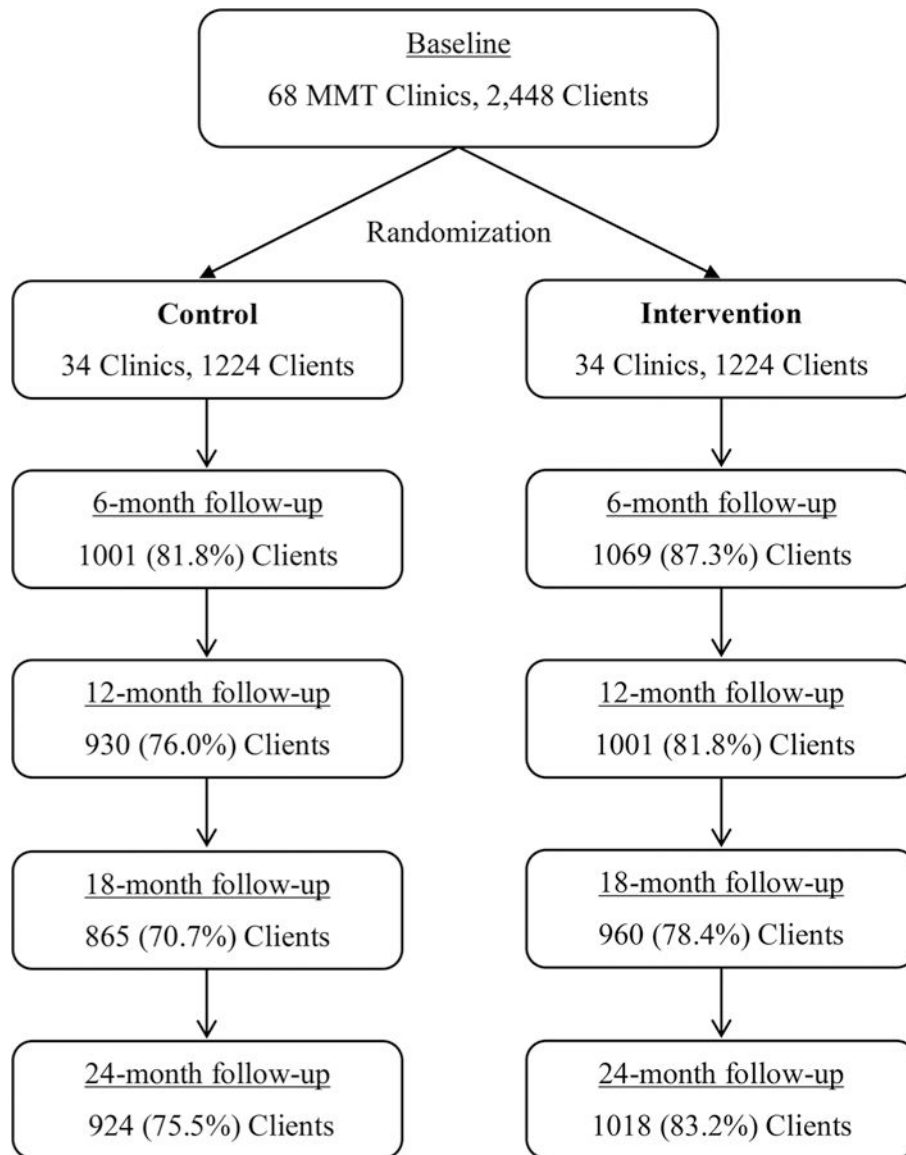
Fig. 1.
The flow of study participants through trial.

Retention in Methadone Maintenance Treatment
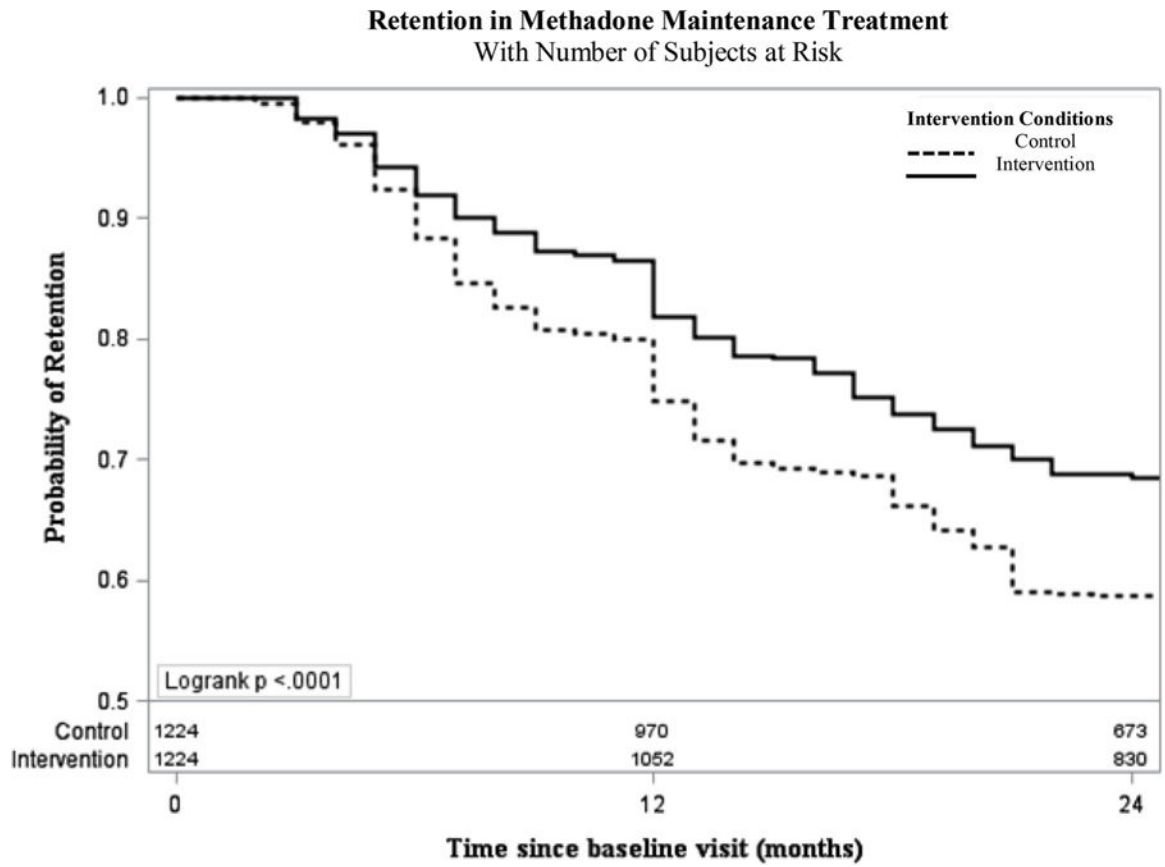With Number of Subjects at Risk

Fig. 2.
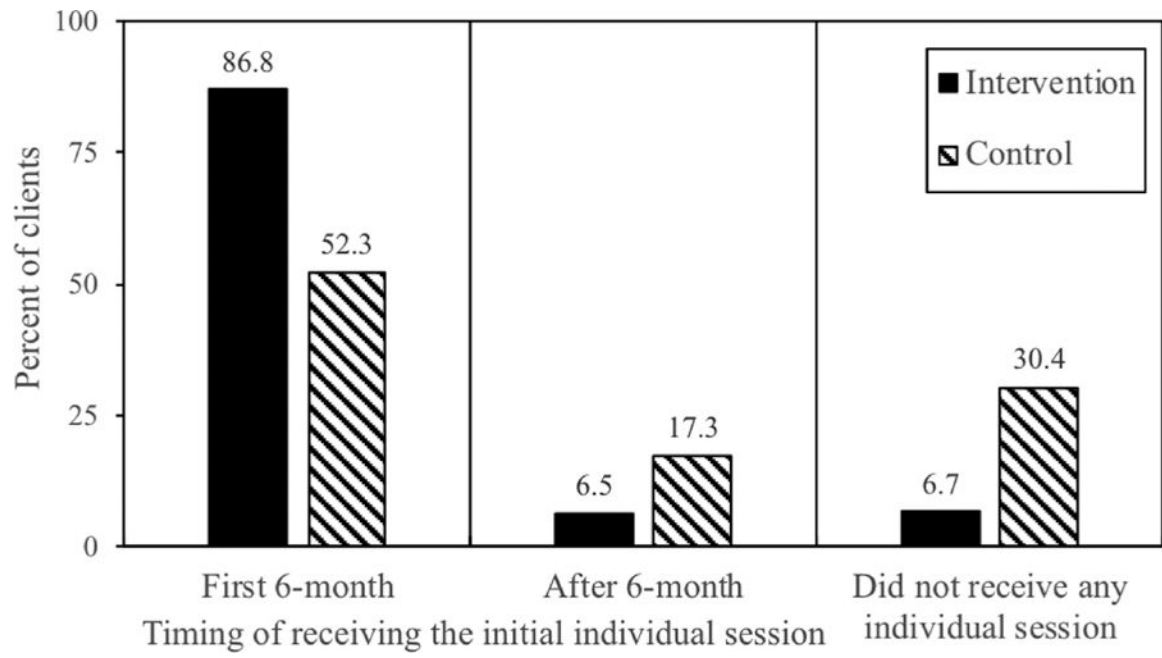Kaplan-Meier curves of retention in methadone maintenance treatment.

Fig. 3.
Percentage of clients who reported having received individual sessions by intervention condition and by the timing of the initial individual session.

Table 1

Demographic and Background Information by Intervention Condition (N=2448).

Characteristics	Control N (%)	Intervention N (%)	P-value[a]
Number of participants	1224	1224	
Age (year)			
Mean ± SD	40.6 ± 6.9	40.0 ± 7.1	0.354
35 or younger	286 (23.4)	322 (26.3)	
36–40	308 (25.1)	337 (27.5)	
41–45	341 (27.9)	317 (25.9)	
Older than 45	289 (23.6)	248 (20.3)	
Gender			0.521
Male	982 (80.2)	953 (77.9)	
Female	242 (19.8)	271 (22.1)	
Marital status			0.361
Single/divorced/	557 (45.5)	520 (42.5)	
separated/widowed	666 (54.5)	704 (57.5)	
Married/living			
with a partner			
Education (year)			
Mean ± SD	9.1 ± 2.7	9.2 ± 2.6	0.340
6 or less	203 (16.6)	159 (13.0)	
7–9	581 (47.6)	643 (52.8)	
More than 9	436 (35.7)	417 (34.2)	
Monthly household income (RMB)			
Mean ± SD	5708.4 ± 23,689.3	4960.8 ± 11,767.8	0.418
5000 or less	955 (78.2)	954 (78.1)	
5001–10,000	199 (16.3)	200 (16.4)	
More than 10,000	68 (5.5)	68 (5.5)	
Years of heroin use			
Mean ± SD	15.1 ± 6.0	14.7 ± 5.9	0.502
10 or less	277 (22.7)	298 (24.4)	
11–20	732 (59.8)	735 (60.0)	
More than 20	214 (17.5)	191 (15.6)	
Years attending MMT			
Mean ± SD	3.7 ± 2.0	3.5 ± 2.0	0.547
1 or less	163 (13.4)	161(13.2)	
Between 1 and 5	661 (54.3)	761 (62.4)	
More than 5	394 (32.3)	298 (24.4)	
HIV Positive	44 (3.7)	48 (4.0)	0.769
Depressive symptoms			
Mean ± SD	16.8 (5.2)	16.3 (5.1)	0.233
Parameter	Hazard Ratio	95% CI	P-value

[a]Random-effects model was used.

Table 2

Multivariable Cox pH regression of time to the first dropout from MMT.

Intervention (REF: Control)	**0.71**	**(0.57, 0.89)**	**0.002**
Age (years, REF: > 45)			
35 or younger	1.21	(0.93, 1.59)	0.153
36–40	1.08	(0.85, 1.38)	0.513
41–45	1.03	(0.82, 1.28)	0.824
Male	1.18	(0.996, 1.40)	0.055
Not Married	1.05	(0.91, 1.22)	0.493
Years of education (REF: > 9)			
6 or less	1.30	(1.06, 1.60)	0.012
7–9	1.24	(1.04, 1.47)	0.015
Household monthly income (RMB, REF: > 10,000)			
5000 or less	1.06	(0.78, 1.44)	0.708
5001–10,000	1.02	(0.72, 1.45)	0.915
Years of heroin use (REF: > 20)			
10 or less	1.40	(1.10, 1.78)	0.007
11–20	1.17	(0.95, 1.44)	0.146
Years attending MMT (REF: > 5)			
1 or Less	1.34	(1.04, 1.73)	0.022
Between 1 and 5	0.96	(0.80, 1.16)	0.703
Depressive symptoms	1.02	(1.01, 1.03)	0.004