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Predictive factors for treatment retention in methadone programs in Indonesia

Riza Sarasvita, (M.Sc., M.H.S., Ph.D.)[a,*],
Anne Tonkin, (B.SC. Hons., B.M. B.S., F.R.A.C.P., Ph.D.)[b],
Budi Utomo, (M.D., M.P.H., Ph.D.)[c],
Robert Ali, (M.B.B.S., F.A.C.h.A.M., F.F.P.H.M., D.Ph.)[b, d]

[a]*Directorate of Mental Health, the Ministry of Health, Republic of Indonesia*
[b]*School of Medicine, University of Adelaide, Australia*
[c]*Faculty of Public Health, University of Indonesia*
[d]*WHO Collaborating Centre, University of Adelaide, Australia*

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Abstract

This article presents the results of a 6-month prospective cohort study of methadone maintenance treatment (MMT) in Indonesia. The study aimed to investigate the predictor variables of retention in MMT in Indonesia. The duration of treatment (in days) was the main outcome of the study. For the study, program, client, social network, and accessibility factors were investigated as potential predictors of retention. The study analyzed the relative weight of each factor in predicting treatment retention. The sample consisted of 178 clients drawn from three participating clinics: Rumah Sakit Ketergantungan Obat and Tanjung Priok in Jakarta and Sanglah in Bali. The 3- and 6-month retention rates were 74.2% and 61.3%, respectively. These rates are comparable with previous studies conducted in developed countries. A survival analysis using a robust estimation for the Cox PH regression found that the strongest predictors of retention were methadone dose followed by an interaction between take-home dose and the experience of the clinic providing this treatment. Other significant predictor variables included age, perceived clinic accessibility, and client's belief in the program. The study concludes that MMT cannot solely rely on the pharmacology for retention but should also promote informed access to take-home doses.

Keywords: Methadone maintenance; Treatment retention; Predictors; Indonesia

1. Introduction

Indonesia has an HIV prevalence of greater than 20% among injecting drug users (Aceijas et al., 2004; United Nations Office on Drugs and Crime [UNODC], 2009). In 2001–2007, around 50% of new AIDS cases were attributed to injecting drug use, although there was a decline in 2008 to 42% (Green, 2009). In 2003, as a response to minimize HIV transmission among injecting drug users (IDU), the concept of opioid replacement therapy through methadone maintenance treatment (MMT) was introduced in Jakarta and Bali. Results from this pilot project were positive (Ali et al., 2005; Utami et al., 2008). Among study participants, there were significant improvements including reduced illicit heroin use and risky injecting behavior. The first primary care-based clinic was subsequently established in July 2006, and since then, scaling up MMT has been widely implemented, including establishing programs in hospital clinics, primary care clinics, and prison clinics.

Although MMT has demonstrated effectiveness and advantages (Ball et al., 1988; Dole, 1988; Simpson & Joe, 1997), this does not automatically mean that people will stay

* Corresponding author. The Ministry of Health, Directorate of Mental Health, Jl. Rasuna Said Kav 4 - 9, Jakarta 12950, Indonesia. Tel.: +62 811807634; fax: +62 215222429.
E-mail address: rizapram@gmail.com (R. Sarasvita).

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in treatment. In fact, duration in treatment is critical to achieving better outcomes, particularly sustained positive behavioral change among drug users (Simpson & Joe, 2004). The longer heroin users remain in treatment, the better the outcome is (Darke et al., 2005; Simpson, 1981). Studies in developed countries have shown that MMT retains around 30% to 60% clients at 1 year (Bale et al., 1980; Bell et al., 2006; Joe, Simpson, & Broome, 1999; Newman & Whitehill, 1979), whereas one study in Indonesia found that the average retention rate at 3 months was around 60% (Rumah Sakit Ketergantungan Obat [RSKO], 2008).

Findings from previous studies in developed countries have concluded that there are three main categories of factors that affect treatment retention, namely, (a) program characteristics, (b) client characteristics, and (c) social characteristics. Program characteristics include methadone dose (Booth, Corsi, & Mikulich-Gilbertson, 2004; Hiltunen & Eklund, 2002; Joseph, Stancliff, & Langrod, 2000), urinalysis policies (Iguchi et al., 1988; Saxon et al., 1996), take-home privileges (Pani & Pirastu, 2000), staff attitude (Bell, Chan, & Kuk, 1995; Caplehorn, Lumley, & Irwig, 1998), and treatment service accessibility (Beardsley et al., 2003; Booth et al., 2004; Friedmann, Lemon, & Stein, 2001; Hser et al., 2001). Client characteristics include age (Deck & Carlson, 2005; Friedmann et al., 2001; Hser et al., 2004), poly substance use (Hiltunen & Eklund, 2002; Sorensen et al., 1985), treatment motivation (Joe et al., 1999; Longshore & Teruya, 2006), and client's psychological function (Grella & Wugalter, 1997; Joe et al., 1999). Social characteristics include family support (Dobkin et al., 2002; Siddal & Conway, 1988), community support (Brown et al., 2004), and peer support (Booth et al., 2004). Some studies found that interactions between these factors were also significant in predicting treatment success (Ball and Ross, 1991; Chou, Hser, & Anglin, 1998; Hser et al., 2001).

Indonesian studies also identify potential predictors of treatment retention. Studies of other chronic diseases have found income and travel distance significant in influencing treatment retention and compliance (Amaliana, 2000; Fauziah, 2001; Noviani, 2001). Family support has also been found to be a significant factor in accessing treatment (Hadi, 1999; Sihombing, 2000; Subandi, 2006), whereas a pilot study found that client satisfaction with MMT was lower when compared with other countries (Uchtenhagen, 2006). In addition, clinic staff attitudes varied toward MMT, with some favoring and others opposing maintenance treatment. This was mainly due to continued illicit drug use while receiving methadone treatment (Isfandari, 2006). This may have also affected the methadone dose and whether the program coordinator abided by other clinic policies.

Realizing that length of time in treatment is a significant factor contributing to better outcomes (National Institute on Drug Abuse, 2009; Simpson, 1979), the present study sought to examine the predictive factors of MMT treatment retention in Indonesia.

2. Methods

2.1. Study design and population

Data collection occurred between July 2006 and January 2008. Data collection occurred at all methadone maintenance clinics that were available at the time of study commencement. This included two clinics that had been established for more than a year (RSKO and RS Sanglah) and a new clinic (Tanjung Priok). The participating clinics were located in Jakarta, the capital city of Indonesia, and Denpasar, Bali, a popular tourist destination. The clinic in south Jakarta is part of a specialist hospital treating substance use disorders (RSKO), whereas the clinic in north Jakarta is part of a primary health center (PKM Tanjung Priok). The clinic in Bali is part of the general hospital (RS Sanglah). Clinics in RSKO and RS Sanglah had full-time staff whose major role was treating methadone clients, whereas the clinic in Tanjung Priok had part-time staff that only treated methadone clients in the afternoon.

Data were collected from two sources, the clinic staff and the clients. The staff data consisted of a self-completed survey of all clinic staff measuring their attitude toward addiction and the clients.

The client data were derived from a 6-month prospective observational cohort study. The study population was drawn from all eligible methadone patients. Dropping out of treatment was defined as a participant failing to take a daily dosage of methadone for a minimum of five consecutive days. This was based upon the clinics' policy and the National Methadone Maintenance Guidelines, which required reassessment prior to treatment reentry if they fail to receive a dose for 5 days. Study participants who left treatment but subsequently reentered within 5 days were counted as a continuous episode of treatment. Participants who reentered after 5 days had the subsequent episode counted as a separate treatment episode. Inclusion criteria for the study were the following: had enrolled in methadone maintenance program within the last 2 weeks, so all participants were relatively new to treatment when they enrolled in the study; aged between 18 and 65 years; mentally competent; physically well enough to participate in the study assessment; willing to provide consent; willing to undergo follow-up assessments at 3 and 6 months.

The study recruited 178 participants from 232 potential clients representing 77% of all possible participants. Among the clients who did not participate in the study, 17 refused to join due to time constraints, whereas 37 could not be recruited due to research staff shortages. The study received ethical clearance from the Human Research Ethics Committee of the University of Adelaide and from the Indonesia Health Research Ethic Committee (National Institute of Health, the Ministry of Health, Republic Indonesia).

Predictor variables were categorized into (a) program characteristics, (b) client characteristics, and (c) social characteristics. Variables within the program characteristics

included clinic regulations (dosing practice and take-home dose [THD] practice), the clinic orientation toward abstinence from all drugs including methadone, and clinic experience of treating drug users. Methadone dose and THD practices were derived from the client's case notes. Previous research (Faggiano, Vigna-Taglianti, Versino, & Lemma, 2003; Joe et al., 1999; Joseph et al., 2000) categorized methadone maintenance doses greater than 60 mg as effective; therefore, this study treated methadone dose as a dichotomous variable: low dose (≤ 60 mg) and high dose (>60 mg). The number of THDs over the 6-month observation period was treated as a continuous variable. Clinic orientation toward abstinence versus maintenance as the ultimate goal was determined through staff perception using the Counsellor Attitudes Survey in methadone maintenance (Kang et al., 1997). A cluster analysis classified clinic staff's orientation into either favoring abstinence or maintenance treatment. The clinic setting was defined as either hospital or primary care. Clinic experience was defined as the duration the clinic had provided methadone treatment, where RSKO and Sanglah were classified as experienced clinics, whereas Tanjung Priok was classified as an inexperienced clinic.

Client characteristic predictor variables included age, imprisonment history, lifetime heroin use, polydrug use, physical health, treatment satisfaction, treatment need, pressure for treatment, self-efficacy, treatment participation, client's belief in the program, and perceived treatment accessibility. Measurements of imprisonment heroin use and polydrug use were derived from the World Health Organization (WHO) Collaborative Study of Substitution Treatment of Opioid Dependence and HIV instruments (Ali et al., 2005). Physical health was measured using the Indonesian version of the Opiate Treatment Index instrument (Ali et al., 2005). All of these instruments were interviewer administered. Other instruments were self-administered and included the Subject Evaluation of Self and Treatment, which was constructed from the Client Evaluation of Self and Treatment of the Texas Christian University Methadone Outpatient Forms (Simpson, 1998). Additional items on treatment accessibility were derived from the instrument used in the study of cost evaluation of drug use in Indonesia (Centre for Health Research, University of Indonesia, 2004).

Social characteristics included family support through treatment attendance, perceived family support, perceived peer support, and perceived community support. These were derived using the Community Assessment Inventory (Brown et al., 2004). Actual family support was assessed by the frequency of family members' attendance at the clinic through case note audit.

2.2. Statistical analysis

To examine treatment retention, survival analysis using Cox PH model (Kleinbaum & Klein, 2005) was chosen. Data were analyzed using Stata version 8, particularly due to its capabilities in handling survival data (Rabe-Hesketh & Everitt, 2007). Survival analysis accommodates different intake and end points and is superior to other regression procedures. It allows possible confounders to be added as covariates (Mattox & Jinkerson, 2005). Cox PH model is suitable for treating recurrent dropouts that occurred during the course of the study (Kleinbaum & Klein, 2005). However, to avoid the likelihood of multiple-entry data receiving greater weight, correlations among data involving the same participants were adjusted (Kleinbaum & Klein, 2005). This provided a robust estimation technique for the Cox proportion hazard model.

Analysis of treatment retention predictor variables used three steps. First, a univariate analysis examined each variable for its potential influence on treatment retention: log-rank test for categorical variables and univariate Cox proportional hazard regression for continuous variables. An a priori decision was made to include variables with a p value of .25 or less in further multivariate analysis. The second step was a multivariate analysis using Cox regression survival analysis of noninteractional to examine the degree to which potential variables affected treatment retention with a significance value set at .1 or less. The final step was multivariate Cox regression survival analysis of interactional models with a p value of .05 or less set for significance.

3. Results

3.1. Client characteristics

Study participants were relatively young, with a mean age of 27.2 years (SD = 4.8). Ninety percent of participants were male (see Table 1). Most were unmarried, had graduated from senior high school, and were unemployed. Of the 37.1% of participants who were employed, 49.3% were in full-time employment. Most reported that their religion was Islam (80.3%). The predominant ethnic background was Javanese (32.6%), followed by Sundanese (16.3%) and Bataknese (4.5%).

Study participants commenced heroin use at an average age of 18.8 years. The average lifetime heroin use among participants was 7.4 years. A history of polydrug use was found in 33.7% of the study population; 37.1% had a history of imprisonment. Most participants (63.5%) still lived with their parents, 10.6% lived with their spouse, and only 5% lived alone. About 15% of participants lived with one or more other IDU.

Table 2 shows baseline clinical data for participants who remained in treatment and for those who later dropped out from treatment. Illicit drug use prior to commencing the program was similar for both populations, except for other opiate use. Those who remained in treatment were significantly less likely to be using other opiates at entry when compared with those who dropped out. Both

Table 1
Participant's characteristics

Characteristics	RSKO	Tanjung Priok	Sanglah	Total
Gender (%)				
Male	82.3	95.2	100	89.9
Female	17.7	4.8	–	10.1
Mean age	27.3 (±4.6)	26.9 (±5.3)	28.1 (±3.7)	27.2 (±4.8)
Marital status (%)				
Married	30.4	36.1	43.8	34.3
Unmarried	59.5	50	50	58.4
Employment status (%)				
Unemployed	64.6	63.9	43.8	62.4
Employed	35.4	34.9	56.3	37.1
Mean year of education (min 6, max 16)	12.8 (±1.9)	11.6 (±2.2)	11.7 (±2.2)	12 (±2.2)
Mean age of first time use of heroin (min 10, max 40)	18.7 (±5.3)	18.3 (±3.6)	18.7 (±8.2)	18.5 (±4.9)
Mean of lifetime heroin use	7.9 (±3)	6.4 (±3.4)	8.7 (±5.6)	7.4 (±3.5)
Imprisonment history (%)	27.8	51.8	0.1	37.1
Mean self-efficacy (min 13, max 47)	32.9 (±4.9)	31.6 (±5)	34.3 (±3.2)	32.4 (±4.8)
Mean perceived treatment accessibility (min 10, max 48)	34.1 (±7.9)	34.7 (±6.3)	36.6 (±6.1)	34.58 (±7.0)

populations had similar levels of criminal involvement, physical symptoms, and psychological distress.

3.2. Treatment retention

Over the study period, 62 participants left MMT at least once. Of those, 36 did not return, whereas 26 reentered treatment. The multiple reentries only occurred in the Jakarta clinics. At RSKO, 15 participants reentered twice, and another recommenced four times. At Tanjung Priok, 4 recommenced twice, 5 reentered three times, and one of them on four occasions. Of those who reentered treatment, 18 remained in treatment until the end of the study period.

Table 2
Baseline clinical data between those who remained in treatment and those who dropped out

Variables	Continuing in MMT ($M \pm SD$)	Dropouts ($M \pm SD$)
Heroin	23.2 ± 8.4	22.4 ± 8.9
	$F = 0.53$, $df = 1$, $p = .817$	
Alcohol	2.9 ± 7.5	1.5 ± 5.1
	$F = 1.483$, $df = 1$, $p = .225$	
Other opiates	0.5 ± 3.1	2.5 ± 7.9
	$F = 5.978$, $df = 1$, $p = .015$	
Sedative	1.1 ± 4.8	2.5 ± 7.7
	$F = 2.367$, $df = 1$, $p = .126$	
Cannabis	1.9 ± 6.1	0.7 ± 4.2
	$F = 1.597$, $df = 1$, $p = .208$	
No. of self-reported criminal behaviors	0.8 ± 1.8	0.7 ± 1.4
	$F = 0.180$, $df = 1$, $p = .672$	
Mean number of physical symptoms	17.7 ± 8.7	18.7 ± 7.2
	$F = 0.558$, $df = 1$, $p = .456$	
Depression status	29.0 ± 7.6	28.3 ± 7.2
	$F = 0.223$, $df = 1$, $p = .638$	
Anxiety status	30.3 ± 7.0	30.9 ± 5.8
	$F = 0.283$, $df = 1$, $p = .595$	

The retention rates at the clinics at 3 and 6 months are shown in Table 3. There were no significant differences in retention between clinics (Kruskall Wallis test $\chi^2 = 2.462$, $df = 2, p = .2920$). The cumulative probability of retention for all clinics at 3 and 6 months were 74.2% and 61.3%, respectively.

3.3. Program characteristics

Initial doses at the three participating clinics were between 15 and 35 mg (M = 24.9 mg). RSKO and Tanjung Priok did not limit the maximum daily dose, whereas Sanglah limited the maximum dose to 180 mg. The mean maintenance methadone dose for the three participating clinics was 76.9 mg (Mdn = 75 mg; Table 4). Sanglah had the lowest average dose; however, the dosing differences among clinics were not significant ($\chi^2 = 2.384$, $p = .304$).

In general, clinics only allowed one THD at a time. Approval for more than one THD needed justification, such as physical health, employment circumstances, hospitalization, or imprisonment. This was to prevent the possibility of diversion. The clinics usually required a family member to attend with the client when multiple THDs were provided. Differences in the proportion of THDs among clinics were significant ($\chi^2 = 949.812$, $df = 2$, $p < .001$). RSKO gave more frequent THDs than Tanjung Priok ($z = -26.824$, $p < .001$) and Sanglah ($z = -19.325$, $p < .001$; see Table 5).

Table 3
Retention rates at the third-month and at the sixth-month follow-up by clinic

Clinics	3 months (SE)	6 months (SE)
RSKO	79.8% (±4.2%)	62.3% (±5.2%)
Tanjung Priok	67.7% (±4.7%)	57.9% (±5.0%)
Sanglah	81.3% (±9.8%)	75.0% (±10.8%)

Table 4
Descriptive statistic of the individual maximum dose (excluding the outliers)

Clinic	Methadone dose
RSKO	Min 25, Max 135, *M* = 76.7, *Mdn* = 75, *SD* = 23.2
Tanjung Priok	Min 25, Max 150, *M* = 79.7, *Mdn* = 80, *SD* = 26.9
RS Sanglah	Min 33, Max 98, *M* = 66.1, *Mdn* = 62.5, *SD* = 18.2
Total	Min 25, Max 150, *M* = 76.9, *Mdn* = 75, *SD* = 24.9

RSKO and Sanglah usually advised clients of the possibility of THD at the beginning of their program, whereas Tanjung Priok preferred to not initially inform the client. Tanjung Priok chose this approach because typically their clients had less family support.

3.4. Predictors of retention

Univariate analysis of the program characteristics for potential predictors of retention identified maximum dose and THDs (p values of .042 and .0037, respectively). Other program characteristics such as clinic attitude toward maintenance methadone, clinic setting, and clinic experience did not affect treatment retention. Nevertheless, because previous studies had found that a clinic's experience in providing methadone treatment could contribute to better outcomes, it was included in further modeling.

Univariate analysis for potential client's characteristics in predicting treatment retention found age, lifetime heroin use, imprisonment, expense of methadone treatment, treatment need, pressure for treatment, self-efficacy, treatment participation, client's belief in treatment, and perceived treatment accessibility met the a priori decision p value of .25 or less for further analysis. Polydrug use was not found to be a significant predictor.

Between-clinic difference in family support was significant ($\chi^2 = 20.090$, $p < .001$), where clients at RSKO received the highest level of family support. Attendance of a family member at the methadone clinics was particularly crucial for receiving THD privileges, as it was one of the clinic policy requirements. Only 36% of participants received this kind of support, with mothers being the largest group (36.1%), followed by fathers and spouses (both 22.2%).

Most participants perceived their family and peers as relatively supportive of them and their treatment program. Nevertheless, there were significant differences in perceived community support between RSKO and Tanjung Priok ($z = -3.465$, $p = .0005$) and between RSKO and Sanglah ($z = -3.112$, $p = .0019$). Perception of community support was lower at RSKO ($M = 30.9 \pm 4.8$), than at Tanjung Priok ($M = 33.8 \pm 5.3$) and Sanglah ($M = 34.9 \pm 3.9$). Univariate analysis of social characteristics found that family support and perceived peer support were eligible for further analysis, with p values of .102 and .249, respectively.

Table 5
The proportion of take-home dose dispensed over the study period

Clinic	Proportion of THD dispensing (%)
RSKO	3,287/15,062 (21.8%)
Tanjung Priok	1,636/15,514 (10.5%)
RS Sanglah	170/2,792 (6.1%)

Table 6
Final model of treatment retention predictors (standard errors adjusted for clustering on ID)

Variables	Hazard ratio	Robust *SE*	95% confidence of interval	*p*
Dose	0.49	0.14	0.28–0.84	.009
THD	0.91	0.03	0.85–0.97	.006
Clinic experience	0.60	0.19	0.32–1.13	.113
Interaction between clinic experience and THD	1.07	0.04	1.00–1.15	.047
Age	0.91	0.03	0.85–0.97	.002
Perceived accessibility	0.95	0.01	0.92–0.98	.002
Belief to the program	0.93	0.03	0.87–0.98	.010
Perceived peer support	1.10	0.04	1.02–1.19	.014

Variables included in the final analysis model using Cox regression survival analysis were dose, THD, clinic experience, age, lifetime heroin use, imprisonment, treatment need, pressure for treatment, self-efficacy, treatment participation, client's belief in the program, perceived peer support, and family support. Interaction variables included were clinic experience and THD, and lifetime heroin use and perceived accessibility. The interaction between THD and clinic experience was based on the assumption that flexibility of THD(s) was determined by the experience of clinic staff.

The noninteractional stage of the multivariate analysis excluded imprisonment ($p = .342$), pressure for treatment ($p = .351$), treatment participation ($p = .303$), and family support ($p = .744$). The interactional stage of the multivariate analysis excluded the interaction between lifetime heroin use and perceived accessibility ($p = .135$), lifetime heroin use ($p = .237$), self-efficacy ($p = .109$), and treatment need ($p = .157$). All remaining variables had p values .05 or less (see Table 6).

The strength of each variable in predicting treatment retention was indicated by the hazard ratio. The strongest predictor of retention was dose, which reduced the likelihood of dropping out of treatment by 51.4%, followed by the interaction between THD and clinic experience, which reduced the likelihood of dropout by between 9.1% and 41.2%, depending upon the clinics experience. The other variables contributed between 4% and 10% to treatment retention. Perceived peer support increased the likelihood of dropout. Therefore, in Indonesia, methadone dose and the interaction between THD privileges and clinic experience were the primary predictors of treatment retention.

4. Discussion

The present study is the first study in Indonesia to investigate retention in MMT. Retention rates at 3 months

and 6 months were 74.2% and 61.3%, respectively. This retention rate is comparable with previous studies from developed countries (Bell, 2000; Booth et al., 2004; Coviello et al., 2004). Among the predictors of retention, dose was the most influential. Clients with doses of greater than 60 mg/day were significantly more likely to be retained in MMT, supporting the results of similar previous studies (Booth et al., 2004; Faggiano et al., 2003; Joe et al., 1991; Joseph et al., 2000; Newman & Whitehill, 1979; Saxon et al., 1996). The staff survey found that those who were more oriented toward a maintenance treatment were more likely to be prescribed higher doses. This situation probably reflects the process of MMT establishment in Indonesia. Methadone was promoted as part of a harm reduction program and in response to an emerging problem of HIV transmission among IDU.

The second predictor of treatment retention was the interaction between the THD policy and the clinic's experience. Although providing more frequent THD(s) in general has been found to be associated with better retention (Grabowski et al., 1993), the amount of methadone treatment experience the clinic has seems to work as a moderator of THD(s) privileges: It influenced the strength of effect the THD has on treatment retention. THDs at the experienced clinics (RSKO and Sanglah) had a fourfold reduction in the likelihood of dropout when compared with the newer clinic (Tanjung Priok). Experienced clinic staff might be more perceptive in assessing suitability for THDs when compared with less-experienced colleagues. Experience in treating methadone clients increases the sensitivity clinic staff have when assessing clients and their needs. Bell et al. (1995) also found that the staff's belief in treatment improves treatment outcome. Sufficient experience may increase the staff's confidence in allowing THDs and hence boost treatment retention.

This study found that THDs were more important to Jakarta participants than Bali participants. Jakarta participants had greater transportation and travel problems than Bali clients. Traffic congestion in Jakarta is more problematic than Bali. During weekdays, it often takes more than half an hour to travel a distance of 5 km. This situation most probably caused Jakarta participants to have multiple entries. Thus, as suggested by Pani and Pirastu (2000), prescribing THDs for participants who face transportation problems could increase their likelihood of remaining in treatment. Although the availability of THDs appears crucial to retaining people in treatment, it also increases the possibility of black market diversion (Pani et al., 1996). Therefore, careful assessment of suitability is required. Hence, clinic experience may moderate its effect.

Other significant predictors of retention were age and participant's belief in the program. Older clients had better outcomes, whereas the more clients believed in the program, the longer they stayed, regardless of the clinic setting. Interestingly, "treatment process constructs" such as treatment satisfaction and counseling rapport, which have previously been found to be more important than belief in the program (Joe et al., 1999; Simpson & Joe, 1997), were not found to be significant predictors in this study. Treatment process constructs were already high for both those who remained in the program and those who dropped out. Hence, there may have been a ceiling effect.

An unexpected finding was that the perception of positive peer support decreased the likelihood of remaining in treatment. Unlike results from a previous study (Booth et al., 2004), which found that negative peer support reduced treatment retention, this study found that the stronger the peer support is, the greater is the likelihood of dropping out of treatment. This was only found at entry. Hence, participants who had more supportive peers outside the methadone program at entry were more likely to leave treatment prematurely. There were three possible explanations of this observation. Firstly, there is the "plausible rival explanation" (Hall, Ward, & Mattick, 1998), where those who remained in treatment had stronger motivation to join the program and coincidently less need for supportive peers than those who dropped out. Secondly, people who believe that they have more options in changing their behaviors may be more confident to leave treatment. So, the perception of having more supportive peers may allow them to explore other alternatives. Thirdly, people who perceive other MMT clients as "less supportive" than their peers may prefer to leave the program early.

There were some limitations to this study. Firstly, the observation period was only 6 months. Thus, the predictors of treatment retention may not be valid for longer periods. Secondly, the number of participating clinics was small, which limited the exploration of clinic setting and experience as potential predictors. Thirdly, as in other field studies, this study faced emerging issues that may affect the study conclusions. There was potential bias due to the establishment of four PHC-based methadone clinics in Jakarta during the course of the conduct of the study. Previous studies have found that scaling up MMT can affect treatment retention (Bell et al., 2006; Brands, Blake, & Marsh, 2002). Knowing that MMT programs are widely available may influence a participant's resolve to stay in treatment. Consequently, the retention rates might have been affected by this scaling up. However, a subsequent audit of case files from those other programs found that only four of the study participants went to the new clinics.

5. Conclusions and recommendations

In summary, program factors through dose and the interaction between THD and clinic experience were the primary predictors of treatment retention in MMT clinics in Indonesia. Provision of higher methadone doses (≥60 mg) proved important in retaining people in treatment. A policy allowing frequent THDs also helped keep people in MMT.

However, the degree of effectiveness of the take-home dosing policy was influenced by the length of clinic experience in treating clients with methadone. Experienced staff, particularly when assessing suitability for THD, may have been more perceptive and consistent in their approach than their less experienced colleagues working in the newer clinics. Sufficient hands-on experience could improve the staff's belief in the program and increase their confidence in providing THDs and hence boost treatment retention.

This study suggests standard operating procedures to provide guidance for assessing suitability for THDs and minimize dose diversion, which may reduce inconsistency around dispensing practices across different settings. It also suggests that delivering regular accurate information about treatment success to the clinic staff and the clients may increase their confidence in the effectiveness of the program and enhance treatment retention.

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