

**Treatment Retention in Methadone Maintenance
Programs in Indonesia:
towards Evidence-Informed Drug Policy**

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Chapter 1

Introduction

1.1. General Introduction

Methadone maintenance treatment (MMT) has been known for many years as the most favourable treatment modality for heroin users in many countries, notably in western countries, such as Australia, The Netherland, The United States of America, Canada and others. The pharmacology of methadone as a long acting synthetic opioid assists heroin addicts increase their productivity so that they are less likely to use illicit drugs, to be involved in criminal activities and to practise „risky“ behaviours related to HIV transmission while they are in treatment. In 2003, the first methadone clinics in Indonesia were established in Rumah Sakit Ketergantungan Obat (RSKO) Jakarta and Rumah Sakit Umum Sanglah (Sanglah) Bali. Results of an evaluation study conducted by the WHO Collaborative Study on Methadone Maintenance Treatment in both clinics showed positive outcomes, supporting the western-based research, such as increasing productivity, decreasing involvement in criminal activities and decreasing „risky“ behaviour (Utami et al., 2005). However, as has been experienced by other methadone clinics around the world, the drop-out rate in Indonesia was relatively high, at 37.8 percent at six months (RSKO, 2005). Realizing that length of time in a treatment programme is a significant factor contributing to better outcomes (Simpson, 1979; NIDA, 2009), further studies which examine the factors predictive of treatment retention are very important.

Various factors may contribute to the drop-out rate in a methadone maintenance program. Client characteristics and program characteristics have been identified in previous studies (Joe et al., 1991; Ball and Ross, 1991; Saxon et al., 1996; Joe et al., 1998) as crucial in predicting the likelihood that a client will be retained in the program. Many studies have also demonstrated that an interaction between these factors has acted

as a significant predictor of treatment success (Joe et al., 1991; Ball and Ross, 1991; Chou et al., 1998). However, these studies have been conducted in developed countries, whereas similar studies in developing countries are rare. Factors that contribute to treatment retention may differ between developed and developing countries, particularly from the socio-cultural point of view.

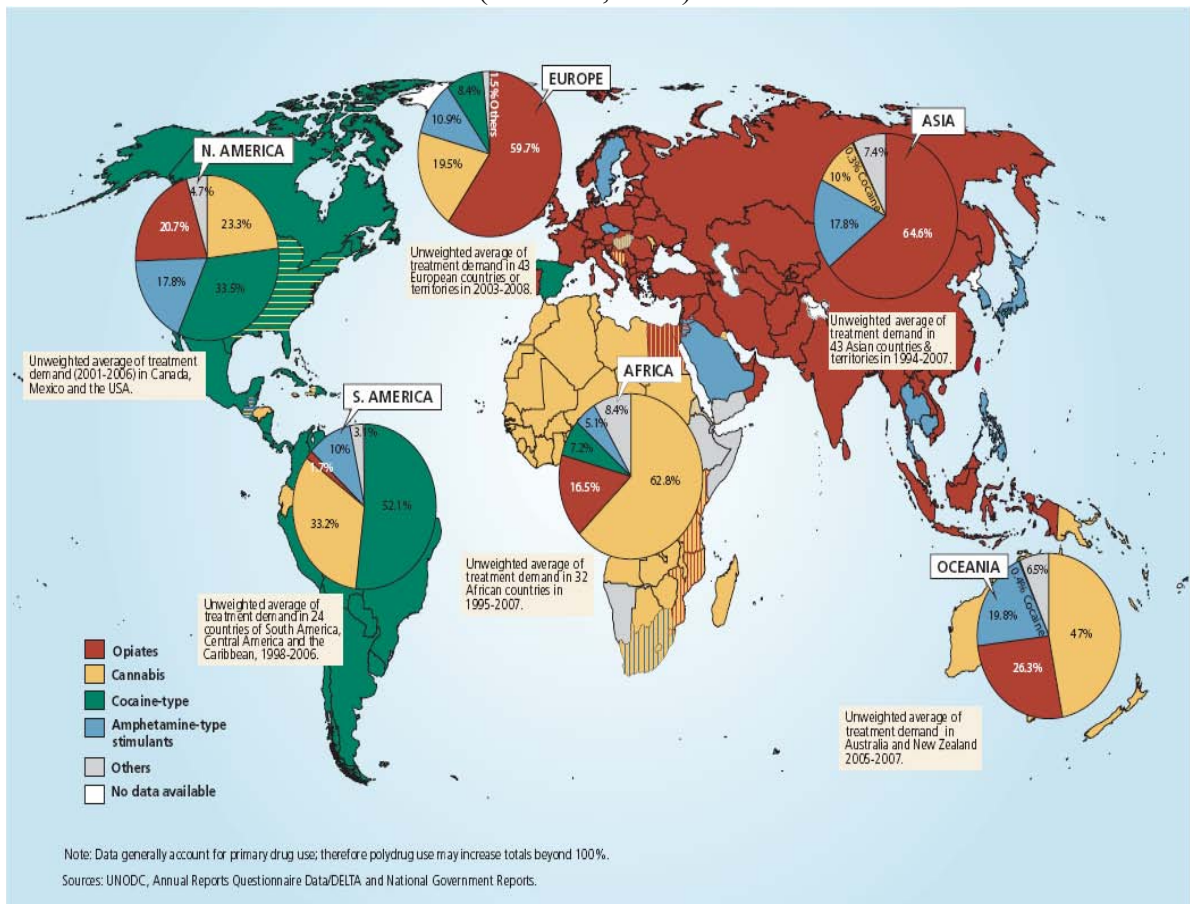
This study focused on the analysis of treatment retention of clients in methadone maintenance treatment programmes and how specific variables, particularly program factors, work as predictors of MMT retention. Additional analysis included other potential predictive factors, such as social supports, recognizing that they may have specific roles in treatment-seeking behaviour within the Indonesian context. An analysis of the predictors which affect client retention in the methadone maintenance programme was the subject of this research using 178 participants. Results of the study are expected to provide valuable inputs for drug treatment policy and treatment service improvement in Indonesia, and internationally.

1.2. Background

1.2.1. Drug Use at the Global Level

Over the decades, substance related disorders have remained a major concern for most countries around the world. The World Drug Report documented that opiates, cocaine, cannabis and amphetamine-type stimulants remained as major illegal drugs in global markets (UNODC, 2009). The proportion of drug users among the population aged 15 to 64 in the last four years remained stable. At least about 0.6 percent of the population in this age range (between 18 and 38 million globally) had been involved in problematic drug use. Although amphetamine-type stimulants (ATS) have been found to be the new major drug of abuse in East Asia (UNODC, 2008), opiates remain the drug group of major concern in terms of treatment demand (Figure 1.1).

Figure 1.1.
Main problem drugs (as reflected in treatment demand), 2007 (or latest year available)
(UNODC, 2009)



Opiate usage worldwide remains stable. The largest proportion of opiate usage is represented by heroin use, which contributes about 70 percent (between 11 to 14.8 million) of the total opiate-using population at the global level (UNODC, 2009). However, the proportion varies across regions. During the latter part of the 1960s, heroin use experienced a rapid expansion in developed countries and then remained static during the 1980s (Costigan, et al 1999). Since 2000, there has been a declining trend in heroin usage in some developed countries such as the United States (UNODC, 2009), while in the developing countries such as in South-East Asia (including Indonesia), Eastern Europe and Latin America, the problem of heroin injection only started seriously in the late 1980's (Costigan et al., 1999). Although UNODC (2009) documented a decreasing

pattern of opiate use in East and South-East Asia recently, nevertheless a pattern of increasing use has been recognized in countries close to Afghanistan, such as Iran, Pakistan, Central Asia, the Russian Federation and countries in eastern and southern parts of Africa. In total, more than half of the total heroin users worldwide come from the Asian region. It is estimated that about 11 - 21 million people worldwide are currently injecting drug users (IDU) (UNODC, 2009).

Over the past two decades, the world wide drug injecting pattern has been associated with a dramatic increase in infections with blood-borne viruses such as Hepatitis C, B and HIV/AIDS. This HIV epidemic has since been reported in the population of injecting drug users in Eastern Europe, Latin America, South Asia and East Asia (including Indonesia) (UNAIDS, 2008). Approximately 25 countries and territories in the world have experienced more than 20 percent HIV prevalence among injecting drug users (Aceijas et al., 2004). It includes countries such as Spain, Russian Federation, Estonia, Argentina, Thailand, and Indonesia (UNODC, 2009). Around 50 percent of new AIDS cases in Indonesia in 2001 - 2007 were attributed to injecting drug user, although there was a declining tendency in 2008 that brought down the number to 42 percent (Green, 2009).

Drug treatment as one strategy in managing substance abuse problems has proven effective in minimizing negative consequences of drug abuse, particularly among IDU. It improves quality of life and productivity of drug users and prevents blood-borne virus transmission among them. Nonetheless, a comparison of the proportion of opiate abusers who received treatment showed significant differences between developed and developing or transition countries. At least 18 percent of opiate abusers in the developed countries have been treated, while less than 3.9 percent of opiate abusers received treatment in the developing or the transition countries (table 1.1).

Table 1.1
Number of opiate abusers, heroin abusers and opiate abusers who received treatment
across region
(UNODC, 2009)

Region	Abuse of opiates (number and % of population 15-64 years)	Heroin abusers (number and % of population 15-64 years)	Opiate abusers treated (number and % of opiate abuser population)
Western Europe	1,450,000 (0.7%)	1,370,000 (0.4%)	336,659 (23.2%)
Eastern Europe	2,140,000 (1.2%)	1,760,000 (1.0%)	83,984 (3.9%)
North America	1,330,000 (0.5%)	1,270,000 (0.4%)	244,240 (18.4%)
South America	850,000 (0.3%)	250,000 (0.1%)	18,319 (2.2%)
Asia	9,330,000 (0.4%)	6,080,000 (0.2%)	284,660 (3.1%)
Oceania	80,000 (0.4%)	30,000 (0.1%)	30,739 (38.4%)
Africa	1,360,000 (0.3%)	1,210,000 (0.2%)	5,367 (0.4%)

1.2.2. Indonesia's Prevalence of Drug Use and Its Associated Problems

Unfortunately, robust and timely statistical research related to drug abuse problems has not been regularly conducted throughout Indonesia. Official reporting usually focuses on illicit drugs, despite the fact that many deaths and violent incidents are related to alcohol use. However, Indonesia has a long history of drug usage, dating from the 17th century, when people mixed tobacco with opium. In the early 20th century, approximately 100,000 registered opium users consumed an estimated 79 tonnes of opium per year (Reid and Costigan, 2002). Since the late 1960s cannabis has been the most common illegal drug widely used by young people in Indonesia (CIA, 2005).

Clinical data quoted from RSKO, the official referral hospital addressing drug treatment and rehabilitation in Jakarta, describes changing trends in drug use over the last thirty years. During the early to late 1970s, the major drug of choice of clients treated at RSKO was morphine and the major method of using this drug was by

injecting. There are no data available which describe the magnitude of the problems related to this drug use behaviour during this period. From the late 1970s to the early 1990s, common conditions changed to issues related to poly-drug use, namely cannabis, benzodiazepine and alcohol. The phenomena of ecstasy and heroin use emerged in the early 1990s. Unlike heroin users, ecstasy users were less likely to seek treatment from RSKO (RSKO, 2005). The first documented case of treatment for heroin use in Indonesia was in 1994 (RSKO, 1995). National data from Badan Narkotika Nasional (BNN) showed that in the last five years, there has been an increase in the population of amphetamine users. This trend was particularly evident in 2004 - 2006 when amphetamines were one of the major drug groups of use after cannabis and heroin (UNODC, 2008).

In 2004 it was estimated that 3.2 million people between the ages of 15 – 64 years (1.5 percent of the total population) in Indonesia were regularly using drugs. About 31 percent of this number or 991,200 people were addicted to heroin with the majority of them being injecting drug users (BNN, 2007). Injecting drug users (IDU) have been the predominant group of drug users seeking treatment in RSKO since 1997 (Sarasvita and Anwar, 2002). Furthermore, risk behaviours related to injecting behaviours have also markedly increased in Indonesia in the last 10 years. Sharing needles and syringes is very common among IDU, as has been demonstrated in several studies (Isrizal and Sarasvita, 1999; Pisani et al., 2003^a; Pisani et al 2003^b). The carrying of clean needles and syringes was avoided by the IDU as it gave the police a cause to arrest them (Pisani, et al., 2003^a). Practicing unsafe sex is also common among IDU. Approximately 80 percent to 90 percent of IDU from these studies admitted having sex in the last 12 months, however less than 18 percent of them practiced safe sex. Twenty-eight percent of IDU from an institutional-based survey in 2002 admitted that they had had multiple

partners during that time (Sarasvita, 2002) while a community-based survey showed that 70 percent of survey participants had had multiple partners in that time (Pisani, et al, 2003^a).

A dramatic increase in HIV transmission following the above risk behaviours has been evident over the past 10 years. A serological surveillance study conducted in RSKO showed that the HIV prevalence among IDU, which was 14.9 percent in 1999, increased to 40.8 percent in 2000 and 47.9 percent in 2001. A similar survey carried out on IDU inmates in the Bali prison in 2001 found a 53 percent prevalence of HIV among IDU. In addition to Jakarta and Bali, the Province of East Java has a high HIV prevalence among its IDU (Depkes RI, 2002).

The impact of problematic drug use is not only on the health sector but also on the economic sector. An Indonesian cost analysis study in 2004 found that the annual national cost of drug consumption was approximately US \$ 125 billion or Rp. 7.800.000 (US \$847) per capita, and half of that was attributed to dependent drug users (BNN, 2007). The loss of productivity due to an increase in hospitalizations and incarcerations on a per capita basis is approximately Rp. 7.000.000,- (US \$ 761) a year (BNN, 2007). Given that the per capita national income of Indonesia in 2006 was only Rp. 13,162,222. (US \$ 1218) (BPS, 2009); the expenditure due to drug consumption and the associated problems of loss of productivity are very serious concerns for Indonesia.

1.2.3. An Overview of Drug Treatment and Rehabilitation in Indonesia

Zero tolerance was the predominant drug treatment policy in Indonesia prior to the 21st century. After the establishment of the only official drug dependence hospital in Jakarta (RSKO) in 1972, the Indonesian Government has since designated 10 percent of bed capacity in 9 of Indonesia's State Mental Health Hospitals to provide drug treatment services, particularly for detoxification. The government, through the Ministry of Social Welfare, has also established 16 social rehabilitation centres in 16 provinces. Vocational training has been integrated into this rehabilitation program. Official documents reported that in 2006, treatment for substance related disorders was available in 17 provinces through 25 general hospitals, 17 rehabilitation centres, 11 prisons with drug treatment programs, nine psychiatric hospitals, six primary health centres, two non-governmental organizations and one drug dependence hospital (Depkes RI report in UNODC, 2007). Overall about 6359 clients were admitted to the drug treatment centres in Indonesia in 2006 (Depkes RI report in UNODC, 2007).

The involvement of the private sector in the area of drug treatment and rehabilitation emerged in the mid 1990s, when the use of heroin increased. Some private hospitals provide various detoxification programs, including symptomatic management with medication and ultra-rapid detoxification using naloxone. Other private organizations have also established a therapeutic-community (TC) based approach for their rehabilitation programs and have subsequently employed overseas and local addict counsellors as core staff in their programs. This approach was popular from the late 1990s to the early 2000s but has decreased significantly since 2004 due to lack of government support and the high cost of treatment (approximately Rp. 3.500.000,- or US \$ 380 per month).

Empowering the primary health care (PHC) sector to treat drug users started in 1998 in Jakarta through a program of training in drug treatment and counselling for the staff of PHCs. Despite this effort, however, up to the end of 2006, there has been no significant impact or increase in the provision of drug treatment services in this sector. This was due to the fact that only three out of approximately 30 trained PHC staff actually implemented detoxification and/or counselling programs in their service. The major reason for this situation was lack of interest and a reluctance to treat drug users (Utami personal comm., 8 November 2005). However, since 2006, the situation has changed. As at late June 2009, there were more than 20 PHCs in Jakarta and 10 other provinces that provided methadone maintenance treatment in their service.

Although the government of Indonesia has increased its health expenditure relative to its gross domestic product (GDP) from 1.6 percent in 2000 to 2.5 percent in 2006, this expenditure is still considered to be low when compared to other countries in Asia (e.g. compared with Cambodia (5.9 percent), India (3.6 percent), Sri Lanka (4.2 percent) and countries in Africa such as Swaziland (6.3 percent) and Burkina Faso (6.3 percent) (WHO, 2009). According to the United Nations Drug Program (UNDP) reports, Indonesia's health expenditure has been the lowest since 1960 (Achmad, 1999) and remained constant up to 2006 (WHO, 2009). Given these health expenditure statistics in Indonesia, there is even more limited expenditure and funding for the country's drug treatment and rehabilitation services. Government attitudes towards this issue remain unclear. The National Narcotics Board (BNN), which is funded by the Indonesian Federal Government, and the Provincial Narcotics Board (BNP), which is funded by provincial local government authorities, have both been allocated budgets for implementing drug treatment programs. Nevertheless, this funding is still relatively small compared with the overall budget of its institutions.

The high cost of treatment fees and the lack of government funding has meant that, according to some studies (Sarasvita, R., et al, 2000; Pisani, E., et al, 2003^b; BNN, 2007) less than 11 percent of heroin users seek treatment because it is unaffordable. The treatment fee for one episode of a hospital detoxification program using symptomatic medication is Rp. 800.000,- (US \$ 86.9). For an outpatient drug free program the cost is approximately Rp. 50.000,- (US \$ 5) per session. When one considers that the average per-capita national income in 2006 was Rp. 13.190.387 (US \$ 1433) or Rp. 1.099.198,- (US \$ 119) per month (BPS, 2009), then the above mentioned treatment interventions and programs are unaffordable for the vast majority of the heroin using population.

1.2.4. Methadone Maintenance Treatment in Indonesia

In 2002 the concept of opioid substitution maintenance treatment such as methadone maintenance was introduced in Indonesia. Prior to that time, the major approach to drug treatment was symptomatic detoxification and social rehabilitation (including the TC-based approach) (Sudirman, 2002). Although systematic studies are not available, clinical observation showed that relapse rate following detoxification programs was very high, while in the mean time medical problems such as HIV transmission among heroin users increased significantly. Therefore, the Ministry of Health, Republic of Indonesia (MoH-RI), with the support of the World Health Organization (WHO), in 2003 established a pilot study of substitution maintenance treatment using methadone in RSKO Jakarta and RS Sanglah Bali.

The choice of methadone for substitution treatment by the MoH-RI was based on the successful implementation of this approach in many other countries. In addition to its effectiveness in changing heroin users' high risk behaviours related to self-injection, this program also offered a relatively cheaper treatment cost. In a specialized hospital

(RSKO), the cost is approximately Rp. 450.000,- (US \$ 48) a month and in a primary health centre, the cost is approximately Rp. 150.000,- (US \$ 16) a month (RSKO, 2007).

Results of a Pilot Project on Methadone Maintenance Treatment (MMT) in Jakarta and Bali showed that MMT had positive outcomes (Utami, et al, 2005). This study reported that significant improvement occurred among study participants in both three-month and six-month follow-up periods. There was a significant reduction in illicit heroin usage from baseline to three-month follow-up and this was sustained at six months of follow-up. Risky behaviour related to injecting was also significantly decreased. It was further found that participants were less likely to be involved in crime and to feel depressed. Participants were also more satisfied with their general health condition during treatment compared to the period prior to treatment. The program showed a positive outcome in preventing HIV; only one further participant at the six-month follow up was diagnosed HIV positive.

The above study also showed different levels of acceptance of the implementation of MMT in Jakarta and Bali (Isfandari, 2005). Methadone recipients demonstrated high acceptance of the program, particularly regarding its positive impact on participants' daily life activities. Clinic staff (service providers), health professionals, parents and religious leaders perceived the program with moderate acceptance: some in favour and some opposed, mainly because some of the methadone recipients kept using illicit drugs despite receiving methadone. The police force expressed conditional acceptance. Police perceived that MMT was much better than the needle exchange program but still had high expectations of abstinence as a major goal of MMT.

1.3. Issues

Although MMT has demonstrated its effectiveness and its advantages in changing heroin users' behaviour (Ball et al., 1988; Dole, 1988; Simpson and Joe, 1997), this does not automatically mean that people stay in treatment. As has been mentioned before, the drop-out rate in RSKO in 2005 was 37.8 percent at six months. This drop-out rate was comparable with studies from the developed countries, which showed around 25 percent to 50 percent of methadone recipients left the MMT program prematurely and within the first six months (Booth et al., 2004; Coviello et al., 2004). Although the drop-out rate in Indonesia is within the global range, the duration of treatment is critical in achieving better outcomes for drug users, and therefore efforts to minimize the rate of drop-out from MMT should be made. The first step in these efforts is through studying which factors contribute to treatment retention.

Findings from previous studies in the developed countries have shown that there are many factors which contribute to the retention rate in MMT programs. In general, there are three main categories of factors that affect the duration for which people remain in treatment: a) program characteristics, b) client characteristics and c) social characteristics. To identify which predictors mainly affect treatment retention in Indonesia was not simple, particularly because an evaluation of drug treatment programs has not been undertaken.

Several possible explanations in the Indonesian context were considered in constructing the study hypothesis. First, MMT is relatively new in Indonesia. Service providers might still be searching for appropriate rules and regulations in establishing their standard of care, which in turn can influence clinic policies. Second, as has been mentioned above, government funding for drug treatment and rehabilitation program is very limited. This can affect how the clinics practice their service. Third, stakeholders'

attitude toward MMT is still ambiguous. An orientation toward abstinence as the major termination state of MMT remains strong, particularly from the law enforcement sectors. It is possible that a similar attitude exists among clinic staff, which will influence client-therapist relationships. Fourth, recent literature on health services in Indonesia has shown that patients have major complaints regarding the quality of health services (Dwiprahasto, 2001; Setyowati, T & Lubis, A., 2003; Ristrini, 2006). It can be assumed that these complaints can lead them leaving treatment prematurely. And fifth, limited literature (Rahma, 1997) and clinical observation showed that there is a strong tendency of family involvement in determining treatment seeking behaviour. In conclusion, although family characteristics might work as an important factor of treatment retention in Indonesia, however, the above information strongly suggests that „clinic factors“ are likely to be a critical influence on drug treatment behaviour in Indonesia.

1.4.Study Objectives

The first study objective was to investigate treatment retention rates in MMT programs in Indonesia in general and in each participating clinic in particular (Chapter 6).

The second study objective was to examine which variables under the general headings of program characteristics, client characteristics, social characteristics and overall characteristics (Chapter 6) were the best predictors for treatment retention in MMT in Indonesia. Quantitative and qualitative estimations were included in the analyses. Any interaction effects among those variables were also analysed. Any description of specific cultural context that influenced MMT treatment retention in Indonesia was also part of this second study objective.

The third study objective was to examine whether the participants who remained in program over the study period showed reduction in their risky behaviour and experienced improvement in physical health status and in their perception towards themselves and the program (Chapter 7).

1.5. Research Questions

- What is the treatment retention rate in Indonesia?
- What are the significant predictors of MMT treatment retention in Indonesia?
- How is treatment retention benefitting participants' behaviour, health status and perception?

1.6. Significance of the Study

This study addressed several important issues of service improvement and drug policy, through identifying predictors of retention in methadone maintenance programs. Empirical clarification of such issues based on local studies not only provides scientific and practical directions to the national efforts to provide substitution treatment, but also contributes to the scientific literature on treatment retention in the Indonesian situation. Information about significant predictive factors could help service providers to change their policies and to improve their quality of service. This information could also be useful for the development of policy in drug abuse issues and to help define the appropriate drug treatment policy for the current situation. The distinctive predictive factors of each clinic are particularly relevant inputs for local health providers, which need to consider social and cultural factors when establishing drug treatment programs. Finally, knowledge of the characteristics and predictors of treatment retention in Indonesia are important for the global community to understand the implementation of substitution treatment in Indonesia and extrapolate to other countries.

1.7.Thesis Outline

The following thesis consists of eight chapters, namely:

- Chapter 1 describes general background, issues, the study objectives, research questions and significance of the study.
- Chapter 2 reviews relevant literature on heroin use, drug treatment for heroin dependence, methadone maintenance treatment, the importance of treatment retention and factors that might contribute to treatment retention. This chapter also reviews relevant literature on the methodology used in the project.
- Chapter 3 describes detailed methodology including conceptual frameworks, operational definitions, measurement of the predictive variables and the implementation of the study.
- Chapter 4 describes program characteristics which include the setting and organization of the program, clinic policies and clinic staff characteristics. This chapter also provides comparisons of staff attitudes between the Indonesian and the American settings
- Chapter 5 describes client characteristics and social characteristics. Client characteristics consist of demographic background, drug use history, drug treatment history, health status, legal status, self-reported heroin use and accessibility of treatment. This chapter also covers clients' perception of themselves and their treatment, such as subjective feelings towards methadone treatment, treatment motivation scale, psychological functioning scale, social functioning scale, therapeutic engagement scale, and their belief in the program. Some comparisons of the client perception scores between the Indonesian and the American settings are also presented in this chapter. The last section of the chapter describes social characteristics that consist of family support through treatment attendance (called

actual family support) and clients' perception of peer, family and community support.

- Chapter 6 examines treatment retention rates over the study period, followed by the analysis of all potential predictive variables of treatment retention. Analysis of each characteristic (program, client and social) is presented first, followed by analysis of overall characteristics. It shows which variables work as major and minor predictors, and which variables have interaction effects in relation to treatment retention.
- Chapter 7 provides the description of treatment retention outcomes. Comparisons of the outcomes for participants who remain in treatment and participants who drop out from treatment are presented. It includes comparisons of behavioural and perception status of the study participants.
- Chapter 8 presents a final summary of the thesis, including study limitations, discussion and study implications.

Chapter 2

Literature Review

2.1. Opioid Use:

The potential of the opium poppy to produce euphoric states has been known for thousands of years. Documentation shows that the Sumerians in the lower Mesopotamia used this plant as early as 3400 BC. Ever since, people have traded it in many parts of the world (Booth, 1996). People's knowledge of the analgesic property of opium poppies was documented in Egypt in an "Ebers Papyri" document (dated approximately 7000 BC) describing the treatment of children who suffered from colic (Doweiko, 1999). Hippocrates in 460 BC also used opium for treating internal diseases, diseases of women and epidemics (Booth, 1996). Since this period, the use of opioids for recreational, spiritual and medical purposes has been intertwined. Opioid substances have passed through various regulatory stages; from no control and legal production and distribution to strictly controlled legal production and distribution, with co-existing illicit production and sale.

2.1.1. The Pharmacology of Opioids

Opioids work by binding and activating opiate receptors such as μ (mu), δ (delta), κ (kappa) and a more recently described fourth receptor type, OFQ/N (ORL-1). Each receptor has its own function. μ and δ receptors are part of the system which deals with mood, reinforcement and pain states, as well as respiration, blood pressure, endocrine and gastrointestinal function, while κ receptors are involved in endocrine changes and analgesia (Jaffee, 1997; Gutstein and Akil, 2001). Depending on its structure and ingredients, each opioid drug particularly binds to specific opiate receptors. If the opioid drug occupies and stimulates its receptors, it is called an opiate agonist. It may work as a

full agonist or a partial agonist. Examples of drugs in this group are morphine, heroin, codeine, pethidine and buprenorphine. Some other opioid drugs occupy their receptors without activating them, and prevent endogenous ligands from binding to them. These drugs are called opiate antagonists (Jaffee and Strain, 2005), such as naltrexone.

Heroin or diacetylmorphine, a semi synthetic form of opiate, is synthesized from morphine and acetic anhydride (Fernandez, 1998). The name “heroin” was given based on its effects which make users feel “heroic”, as was reported by the chemists who developed this substance and first tried it (Mann and Plummer, 1991 in Doweiko, 1999). Heroin was initially produced at the Bayer pharmaceutical company in Germany (Doweiko, 1999) and introduced in 1898 as a cough suppressant, reputed to have less dependence than morphine (Strain and Stoller, 1999; Schuckitt, 2000). Heroin is categorized as a prodrug agonist. It is metabolized in the blood to 6-mono-acetylmorphine (6-MAM). Although it is not a potent μ agonist, heroin and 6-MAM are more lipid soluble than morphine, and therefore enter the brain rapidly (Jaffee et al., 1997; Gutstein and Akil, 2001; Jaffee and Strain, 2005) and have a correspondingly rapid onset of action. Together with its pharmacological effect as a μ -agonist opioid, these characteristics make it major contributors to dependence and tolerance states within the community (Jaffee and Strain, 2005).

The biological half-life time of heroin is about 3 to 5 hours, depending on the dose (O’Brien, 2006). Because of its short-acting characteristic, tolerance among chronic heroin users can develop rapidly and withdrawal syndromes can be experienced very quickly and quite intensively (Jaffee et al., 1997). Withdrawal symptoms include watering eyes, runny nose, yawning, sweating, restlessness, chills, cramps, muscle aches (Doweiko, 1999). However, this unpleasant withdrawal syndrome is not life-threatening (Weil and Rosen, 1998; O’Brien, 2005).

Frequent and prolonged heroin use can induce a long-term change in the central nervous system which includes adaptations in reward, learning and stress responses (Doweiko, 1999). Lyvers (2000) reports that pathological changes occur in dopaminergic brain circuits among chronic users, and these contribute to the difficulty of heroin users in stopping use of the drugs. Further, Lyvers suggests that dopamine reduction may be responsible for the dysphoria and anhedonia during early abstinence in chronic users, phenomena that users attempt to avoid. However, even though neuro-adaptation during chronic heroin use decreases electrical activity within the brain, users may still experience a brief euphoric state (Jaffee and Strain, 2005). Therefore, people who are addicted to heroin keep using heroin, not merely to prevent withdrawal symptoms, but also to achieve the euphoric effect that only lasts from 45 seconds to several minutes (Jaffee and Strain, 2005, O'Brien, 2005). Yet, the development of a dependence state is not solely based on this rewarding effect (Doweiko, 1999).

2.1.2. The pattern of heroin use and its consequences

There is no single explanation for continued heroin use. Clinical experiences and some studies show that to understand why someone becomes addicted to drugs, three factors should be considered, namely, the drug (particularly its pharmacologic action), the individual's characteristics (including their attitude towards the substance), and the setting (the interaction between the physical and social setting within which the use occurs) (Zinberg, 1994). Thus, dependence is the result of a complex interaction of these factors (Doweiko, 1999). Each individual has a unique pattern in shaping their dependence state. For some people, the substances or the individual factors may have a stronger influence on promoting their addiction, whereas for others, the setting might be more influential.

Most heroin users start their heroin taking behaviour by oral ingestion or through inhalation (known as „chasing the dragon“) (Schuckit, 2000; Ray and Ksir, 2004). The change from oral use to injection sometimes is unplanned (Crofts et al., 1996, Schuckit, 2000). Almost half of them commence injecting drug based on their own will (Crofts et al., 1996). However, several studies show that peer groups play an important role in encouraging heroin addicts to start injecting drugs, particularly through modelling (Crofts et al., 1996; Fernandez, 1998; Schuckit, 2000).

The rapid onset of effects of heroin, where people have a brief intense euphoric state called a “rush” or “flash”, is experienced by users particularly if they inject the drug as a bolus, thus delivering it most rapidly to the brain. This situation is believed to act as a reinforcer for people to continue to use heroin by injecting it despite the risks (Uchtenhagen et al., 1999; Schuckit, 2000; Gutstein and Akil, 2001; Jaffee and Strain, 2005). Limited heroin availability in the market also contributes to injection prevalence as the price of heroin increases and the purity decreases. These latter two factors make heroin users prefer injection for economic reason (Fernandez, 1998).

Some heroin addicts must use heroin every four hours to prevent withdrawal (Fernandez, 1998). With an intensive frequency of heroin use, almost all addicts spend their time solely in fulfilling this need. Consequently, attention towards their physical health is lessened. Some ignore the risk from the way they inject their drugs which is associated with many harms while some of them do not even know it. In most cases, they rarely use sterile water to mix the powder and rarely clean the skin before the injection (Ray and Ksir, 2004). Almost all heroin injectors have experienced sharing used needles and syringes and other paraphernalia (Costigan et al., 2001; Pisani, et al., 2003). In Indonesia, they also do not filter particulate impurities out of the liquid with cotton before the injection (Sarasvita, 2002).

The harmful consequences related to injecting behaviour include the transmission of blood borne viruses, particularly HIV/AIDS and Hepatitis C, the risk of overdose, and contracting other infections such as endocarditis, abscesses and neurological infections (Jaffee and Strain, 2005). About 85% of IDU in Indonesia have shared needles and syringes in the previous week before interview (Pisani et al, 2003). The situation is worsened by the fact that only 10% of the IDU in the same study used condoms when having sex, leading to further transmission of infection to others. Another risk behaviour that commonly occurs among IDU is involvement in criminal activities in order to fulfil their need to buy heroin (Fernandez, 1998; Costigan et al., 2001).

2.1.3. Approaches to treatment for heroin users

There was a traditional belief that drug addiction was a state in which a person has lost the ability to control the drug they are using (Zienberg, 1994). However, recent studies have shown that drug addiction does not merely involve “a loss of control” but also some physical change, particularly in brain circuits. These findings make it clear that drug addiction is a brain disease (Lyvers, M., 2000). Drug addiction, especially heroin addiction, is categorized by The Institute of Medicine and the National Institutes of Health in the US as a chronic relapsing disorder (Jaffee et al., 2000). Treating heroin addicts is therefore very challenging (Ball, 1988) and quite often they have a poor prognosis (Doweiko, 1999), particularly if the person only experiences a detoxification process without further support. Relapse rates following detoxification alone are relatively high (Dole, 1988; Ball and Ross, 1991; NIDA, 1999).

Treatment programs differ in their orientation, in the specific strategies used and in the settings in which treatment occurs (Fisher and Harrison, 1997). There are three major treatment approaches for heroin dependence: a). Opioid replacement therapy; b).

Residential drug-free program and c). Outpatient drug-free program. Opioid replacement therapy does not require heroin addicts to stop using drugs. Instead, it replaces a short-acting and illicit opioid drug with a long-acting opioid drug given by a nonparenteral route of administration (Hall et al, 1998). On the other hand, both residential drug-free programs and outpatient drug-free programs require heroin addicts to cease their drug use behaviour. The effectiveness of drug treatment can be based on several indicators: cessation of drug use, decrease in criminal activities, decrease in HIV-related risk behaviours, and improvements in productivity and indicators of a healthy life (Ball and Ross, 1991).

A form of opioid replacement therapy that has been widely implemented in many parts of the world is the methadone maintenance program. Nevertheless, efforts to find alternative replacement therapies have been made and possibilities include: a) Levo-alpha-acetyl-methadol (LAAM), a full agonist agent; b) Buprenorphine, an opioid partial agonist; and c) Diacetylmorphine (heroin) (Ward et al, 1998). LAAM was comprehensively studied in the 1970s and showed its advantage as an opioid replacement therapy. This agent has a longer half-life compared to methadone and, like methadone, it is effective when ingested orally (Ward et al, 1998). Buprenorphine, as a partial agonist at μ -type opioid receptors, has also shown its strengths as an opioid replacement agent. It works as effectively as methadone and has greater safety in overdose (Lewis, 1985). Buprenorphine also produces less severe withdrawal symptoms as it is not a pure agonist (Ward et al, 1998). The use of heroin as an alternative substitution therapy invites debate. The major disadvantages of this approach are its illicit status and shorter half-life than methadone (Ward et al, 1998). Nonetheless, many supporters of heroin maintenance perceive this approach as an intermediate goal of treatment which can be more attractive for those who are not interested in joining other

treatment programs. The benefits include a reduction in the need for criminal activity to fund heroin use, and the provision of clean needles and syringes.

Residential drug-free programs include the therapeutic-community (TC) program and/or the twelve-step program. The TC approach uses community (in the program) as a method to change the addict's behaviour (De Leon, 2000). All components in the TC program (the organization, the staff, the clients, and the daily activities) are designed to facilitate healing, learning and a process of change within the individuals (De Leon, 1999). Abstinence from any kind of drugs is one of the major goals of TC programs. Consequently, the only recognized medication use in this program is limited to those who require drugs for routine health care and/or for those with chronic health conditions (De Leon, 1999).

In the outpatient drug-free program, abstinence from any kind of drugs is also one of the major goals. The program allows medically managed drug detoxification and symptomatic medications (including medication for psychiatric emergencies). Included in the outpatient drug-free program are psychosocial interventions and/or self-help group activities. Examples of psychosocial intervention are general psychotherapy, behaviourally oriented therapy (motivational interviewing and cognitive-behaviour therapy) and specific techniques for relapse prevention (Fisher and Harrison, 1997).

2.2. Methadone Maintenance Treatment

As one of the opioid-replacement therapy modalities, the methadone maintenance program has been thoroughly studied. Methadone maintenance was pioneered by Vincent Dole and Marie Nyswander in a New York City clinic in the early 1960s. Their program was based on their belief that chronic heroin addicts suffered from what they called "*narcotic hunger*" (Dole and Nyswander, 1965), a phenomenon that makes them

always busy seeking heroin regardless of the consequences. This first program of methadone maintenance treatment (MMT) not only offered methadone as substitution for diacetylmorphine (heroin), but also other psychosocial services.

Dole and Nyswander applied strict requirements for any heroin addict who wanted to join the program. These strict requirements included having at least four years of heroin dependence, a minimum age of twenty-one, having no alcohol or other drug problems and having previously failed other drug treatments (Uchtenhagen, 1990). Diagnostic and Statistical Manual of Mental Disorders 4th Edition (DSM-IV) classified persons with heroin dependence as those who have “*significant levels of tolerance, experience withdrawal on abrupt discontinuation of heroin, and preoccupation to obtain and administer heroin*” (APA, 1994). Basically, the objectives of MMT programs are to provide appropriate individual doses to overcome opioid abstinence symptoms and to engage heroin addicts in a therapeutic relationship with the program and the counsellor (Senay and Uchtenhagen, 1990). Decades after this first trial, MMT implementation and regulation all over the world became more diverse (Joseph et al, 2000). Recently, the main goals of the program have expanded to include prevention of HIV transmission in addition to prevention of heroin craving and the development of a therapeutic relationship (Ball et al., 1988; Joseph et al., 2000).

2.2.1. The pharmacology of methadone

Methadone is a synthetic opiate which has a biological half-life much longer than that of heroin. The half-life is between 15 to 31 hours with an average of 24 hour or longer (Walsh and Strain, 1999; Joseph et al., 2000; Gutstein and Akil, 2001). Methadone is well absorbed in the gastrointestinal tract, allowing use by oral administration (Dole, 1988) and it is metabolized in the liver (Marsh and Strain, 1999).

Accumulation in various body tissues, including the brain, occurs after continual usage (Ward et al., 1998). This cumulative effect may partly explain why tolerance develops more slowly to methadone than to morphine (Gutstein and Akil, 2001). Although methadone also binds to μ opiate receptors, it enters the brain more slowly than heroin, with an analgesic effect being experienced within 30 to 60 minutes after the oral administration (Marsh and Strain, 1999). It reaches its peak concentration in the brain between 1 to 2 hours after dosing (Gutstein and Akil, 2001) and thus does not cause a euphoric “rush”. A discontinuation of methadone administration may result in a withdrawal syndrome that is slow in onset but protracted in duration (Gutstein and Akil, 2001; O’Brien, 2006), because methadone is slowly released from extravascular binding sites into plasma (Gutstein and Akil, 2001).

In terms of organ toxicity, methadone is relatively safe (Jaffee et al., 2005; Epstein et al., 2005), even for female heroin addicts who are pregnant (Joseph et al., 2000). Some studies have indicated several side effects, including sedation, constipation, sweating, occasional transient ankle oedema in females and changes in libido, which will recover over time or with use of symptomatic medication (Senay and Uchtenhagen, 1990; Gutstein and Akil, 2001). The commonest long-lasting effects are constipation, excessive sweating, and complaints of decreased libido and sexual dysfunction (Jaffee et al., 2005). In general, all of the side effects have been reported to improve with longer time in treatment (Senay and Uchtenhagen, 1990). Based on several studies, Lowinson et al. (1997) concludes that people in the methadone treatment can function normally and do not have problems with their intellectual capacity.

A dose of 20 to 40 mg has been shown to be adequate to prevent withdrawal symptoms, while a daily dose between 60 to 120 mg is cited as sufficient to maintain a

concentration in blood that can continuously occupy opiate receptors and thus help maintain normal function (Dole, 1988; Lowinson et al., 1997). Initial doses usually start at 10 – 40 mg (Ward et al, 1998). To achieve a stable dose, the dose should be increased carefully, particularly given the fact that methadone has a possibility of cumulative effects in the body tissues (Lowinson et al., 1997). Usually the dose is increased gradually over several weeks (Ward et al, 1988). Monitoring of any withdrawal or intoxication symptoms should be based on the time frame of the dose reaching peak plasma concentration (Kreek, 1979). In terms of methadone withdrawal, a double-blind study conducted by Senay et al . (1977) found that fast dose reductions (a 10 percent weekly reduction) were related to higher drop-out rates, more heroin use and greater subjective distress than gradual dose reductions (a 3 percent weekly reduction) (Strain, 1999). Therefore, it is recommended that, when methadone is withdrawn, the dose is reduced slowly (Ward et al., 1998; Strain, 1999).

The cumulative effect of regular use of methadone is one reason that methadone users are less likely to develop tolerance to its mood-elevating effect (Gutstein and Akil, 2001). Because of this property, many users can continue to administer methadone only once a day at the same dose for a very long period (Dole, 1988; Lowinson et al, 1997). Nevertheless, Nilsson (in Walsh and Strain, 1999) found that some patients, particularly after having a stable dose for at least 1 month, develop rapid metabolism that reduces the duration of effect. This situation may lead them to have methadone doses more than once a day, known as a “split dose”. In this circumstance, other pharmacotherapies with longer duration of action should be considered.

2.2.2. The effectiveness of methadone maintenance programs

Because of its characteristics, methadone has been more effective than other drug treatments in retaining a larger proportion of heroin addicts in therapeutic programs (Bale et al., 1980; Darke et al., 2005). Studies in western countries have shown that MMT retains around 30% to 60% patients over one year (Newman and Whitehill, 1979; Bale et al., 1980; Joe et al., 1999; Bell et al., 2005). A recent study in Israel showed a higher retention rate of 74.4% (Peles et al., 2005). These retention rates are much better than other treatment programs such as therapeutic community programs and outpatient drug-free programs where retention rates for one year were 17.9% (Bale et al., 1980) and 15% (D'Ippoliti et al., 1998), respectively.

There is evidence of the effectiveness of MMT in changing addicts' risky behaviour (Ball and Ross, 1991; Ward, et al., 1998). If a stable dose has been achieved, MMT tends to prevent addicts from experiencing craving and consequently reduces the likelihood of heroin use while in treatment (Ball and Ross, 1991; Lowinson et al., 1997; Joseph et al., 2000; Preston et al., 2000; Mattick et al., 2003). Participation in a methadone maintenance program reduces risk behaviours related to HIV transmission such as sharing needles, syringes and other paraphernalia (Dole and Joseph, 1978; Ball et al., 1988; Simpson and Joe, 1997; Mattick et al., 2003; Gowing et al., 2004). An outcome study in Indonesia found that about 80% of the study participants abstained from all high-risk behaviours related to injecting in the six-month follow-up (Utami et al., 2008). International data indicate that relative risks of sharing the injecting equipment at the time of follow-up ranged from 0.18 to 0.78 (Gowing et al., 2005). The overall HIV risk scores using the Risk Assessment Battery Score (RABS) from international studies showed significant reductions at the follow-up time compared with baseline, with p-values at 0.001 to 0.01 (Gowing et al., 2005). MMT is also effective in

reducing clients' engagement in crime. The Treatment Outcome Prospective Study (TOPS) showed that the odds ratios of criminal behaviour significantly decreased to 0.36 (p-value 0.05) during long term maintenance treatment (Hubbard et al, 1989).

In addition to reductions in risky behaviour, methadone recipients also report feeling healthier and having a more productive life style (Dole and Joseph, 1978; Uchtenhagen, 1990; Ali et al., 2005). A study in Indonesia showed that the employment rate increased from about 10 to 15% after six months in treatment, while the unemployment rate decreased by about 20% in the same time frame (Utami et al., 2008). The daily dose of methadone allows patients to have regular contact with the counsellor, an occasion that can mediate necessary actions for overcoming any emerging problems (Senay and Uchtenhagen, 1990).

2.2.3. The characteristics of methadone maintenance clinics

Decades after Dole and Nyswander established the first MMT clinic; the current implementation of clinics varies (Strain and Stroller, 1999). Originally MMT addressed a long-term maintenance therapy and a high dose regimen was preferred (Bell et al., 1995). However, this original model is no longer strictly implemented (Uchtenhagen, 1990; Strain and Stroller, 1999). A study across clinics in the US showed that not all methadone providers applied the original idea of MMT (D'Aunno and Pollack, 2002). This study showed that there was a tendency to dispense lower doses in particular clinics, with the goal of giving the lowest dose that would prevent withdrawal. Clinics with smaller number of patients, clinics where the majority of clients were under 30 years old and clinics which were led by clinic directors with a strong belief in twelve-step programs and eventual abstinence, were more likely to give low doses. Clinics with

accreditation from the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) were more likely to dispense higher doses (D'Aunno and Pollack, 2002).

Rosenbaum (1985) classified three types of clinic philosophy which affect program implementation, namely: “*medical-model, reformist and libertarian*” (page 376). In the medical-model clinic, addiction was perceived as a chronic disease, and therefore methadone medication could be a life long process. In the reformist clinic, methadone therapy was perceived as a mechanism to achieve abstinence as an ultimate goal. This type of clinic was also known as an abstinence-oriented program (Caplehorn et al., 1993; Bell et al., 1995). Originally, reformist clinics were driven by professionals and addiction counsellors who dealt with the criminal justice system and/or rehabilitation system. Thus, duration in treatment should be as short as possible. Lastly, the libertarian clinics prioritized individual freedom in implementing their program. The objective of this philosophy was to humanize heroin addicts. Staff of these clinics believed that every human being – even though they are an addict - has a right to determine what they want to do for their own life. Consequently, heroin addicts can stay in the program as long as they want. Use of the term “client” for heroin addicts was introduced in this type of clinic (Rosenbaum, 1985).

Bell (2000) identified that changes in MMT implementation might also be affected by the rapid expansion of methadone clinics in environments in which qualified and trained staff are not sufficiently available. Staff with limited knowledge of addiction and MMT show a tendency to give lower doses and to emphasize counselling and time-limited treatment (Bell, 1995). This situation may affect treatment outcomes, including lower retention rates (Caplehorn et al., 1994).

Methadone programs can also be affected by clinics' regulations. A low-threshold methadone clinic loosens its requirements. In this clinic, clients can leave and re-enter the program easily; there is no waiting list and no punishment for the continuation of illicit drug use (van Ameijden et al., 1999). On the contrary, high-threshold methadone clinics tighten requirements such as: registration of all participants and limits on the number of participants in the program at the same time (Fugelstad et al., 2007). Both styles of regulation have strengths and weaknesses: strict inclusion criteria in high-threshold programs decrease the retention rate while loose rules in low-threshold programs increase the possibility of methadone diversion outside the treatment population (Fugelstad et al., 2007).

The clinic setting also influences the implementation of MMT, although the impact on treatment outcomes has not been extensively investigated (Gossop et al., 1999). Specialist drug treatment clinics dispense more methadone liquid, and more frequently on a daily basis than general practitioners (GPs). Specialized drug clinics are also more likely to monitor methadone dispensing than their counterpart (Gossop et al., 1999).

2.3. The importance of treatment retention

Duration in treatment is critical to achieving better outcomes, particularly sustained positive behavioural change among drug users (Simpson, 2004). The longer heroin users remain in treatment, the better the outcome (Simpson, 1981; Darke et al., 2005). The National Institute on Drug Abuse (NIDA), based on several large epidemiology studies in the United States, concluded that at least 90 days in treatment is needed to achieve better outcomes (NIDA, 2009). Heroin addicts who leave any kind of treatment before 90 days in treatment have no significant improvement in behaviour or

other outcomes compared with untreated heroin addicts (Simpson, 1979; Simpson, 1981). Prolonged attendance or completion of a program decreased the likelihood of relapse (Simpson, 1981). Several studies have shown that a minimum of one year in treatment for MMT was critical for maintaining better outcomes (Simpson, 1979; Simpson et al., 1997).

2.3.1. Individual Benefits

Remaining in treatment for sufficient time gives drug users more opportunity to effect behaviour change and to integrate this change into their daily activities (Ball and Ross, 1991; Chou et al., 1998; Ward et al., 1999; Broome et al., 1999; Zhang et al., 2003). Many drug users who come into treatment are unsure of their motives for seeking treatment (DiClemente et al., 2004). By joining a treatment program for an adequate period of time, they may become motivated more to learn and maintain new behaviours. A Drug Abuse Treatment and Assessment Resources (DATAR) project found that if the clients remain in treatment for adequate period of time, their new behaviours are likely to remain even if they then leave treatment (Simpson and Joe, 1997). Clients remaining in treatment report feeling better and more optimistic towards their future life. Their productivity is increased, as well as their physical health, and they are less depressed (Ali et al., 2005).

2.3.2. Public Health Benefit

In general, treating drug addicts in any treatment modality has a positive impact from a public health perspective. A report from the Maryland Drug Administration Office (2002) showed that treatment costs for people addicted to alcohol and other illicit drugs were about 3% of the public health cost of substance use, including traffic crashes due to drunk driving (9%), medical problems (10-28%), related crime (9-53%), and lost

earnings due to sickness/death related to alcohol use (67%). Further, it was also reported that every dollar spent on drug treatment saves from \$4 to \$5 of drug-related expenses. Annual incarceration expenses and costs related to untreated drug addicts were very high, US \$39,600 and US \$43,300, respectively (MDA, 2002), while the average cost of a single treatment effort was \$2,941 (CSAT, 2002). Methadone treatment itself proved its cost-effectiveness compared to other medical therapies (Barnett, 1999). A systematic review and economic evaluation of a randomized control trial of MMT and buprenorphine maintenance treatment (BMT) from Connock et al (2007) showed that, compared to no drug therapy, the incremental cost-effectiveness ratio (ICER) of MMT was £13,697 per quality-adjusted life year (QALY). Compared to BMT, MMT was slightly more effective (0.0126) and less costly than BMT, and had better cost-effectiveness.

Cost effectiveness in terms of a public health perspective cannot be separated from treatment retention as an important treatment outcome. In general, treatment retention in opioid-replacement therapy is correlated with decreased criminal involvement, mortality rates and HIV-risk behaviour (Ball and Ross, 1991; Helmus et al., 2001). For instance, the chance of being arrested for drug addicts who completed treatment was reduced by up to 54% (MDA, 2002), and this reduction had a significant impact towards public health cost. Several studies of MMT showed that the annual mortality rate for those remaining in treatment with high dose and indefinite stay programs was 0.56%, compared with 6.91% for those who drop-out from treatment (Barnett, 1999). Addicts who remain in MMT for longer also reduced their risk of having HIV transmission through the reduction of unsafe injecting behaviour (Serpelloni et al., 1994; Grella et al., 1997) and/or proper knowledge of HIV prevention (Serpelloni et al., 1994). Also contributing to the decrease of HIV transmission risk was the fact that addicts in MMT

reported fewer sexual partners and higher frequency of using condoms (Lollis et al., 2000). Quoting several studies, Gowing et al (2006) demonstrated a lower proportion of HIV seroconversion among people remaining in MMT for longer than 12 months compared to those remaining in treatment for shorter times.

2.4. Predictors of treatment retention

Treatment retention of MMT has typically been studied in developed countries. The factors predicting treatment retention in this setting are described in section 2.4.1. To predict which factors will work in the Indonesian context is quite challenging, because similar studies have not yet been carried out in a developing country. Section 2.4.2 describes several Indonesian-based studies in the area of chronic diseases and health services. Although these studies did not particularly investigate treatment of drug addiction and more specifically treatment retention in MMT, nevertheless they reflect health services in Indonesia and may act as a theoretical bridge to build a conceptual framework for a study on treatment retention in MMT in Indonesia.

2.4.1. Experience from Western Countries

Several studies have addressed potential predictive factors for the duration of treatment and show there is no single factor that affects duration in treatment. In many studies, factors were found to interact in influencing treatment retention (Chou et al., 1998; Magura et al., 1998; Broome et al., 1999; Hser et al., 2001). In general, three major domains of predictors have been frequently reported: program, client and social characteristics. In the early period of studying treatment retention, attention was focused on client characteristics. Study findings from Ball and Ross in 1991 showed that program characteristics in MMT were much more important in determining treatment outcomes, including treatment retention (Ball and Ross, 1991). These results opened

researchers" perspectives and since then, attention has shifted towards program characteristics as predictors of treatment retention.

2.4.1.1. Program characteristics

Based on several studies, program characteristics that predict treatment retention include clinic regulation, clinic orientation and treatment accessibility. Clinic regulations include dosing, urinalysis policies and take-home doses – where clients have the opportunity to take home part of their weekly dose of medication, thus reducing the number of times they need to attend the clinic (Pani et al., 1996). Clinic orientation refers to whether the clinic has a philosophy favouring abstinence or harm reduction in providing their service. Treatment accessibility covers service charges and transportation.

In relation to clinic regulation, dose and urinalysis policies consistently show significant correlation to treatment retention. Almost all research has found that higher dosages retain clients for longer than lower dosages (Newman and Whitehill, 1979; Caplehorn and Bell, 1991; Joe et al., 1991; Saxon et al., 1996; Joseph et al., 2000; Hiltunen and Eklund 2002; Booth et al., 2004). These studies found that doses between 60 to 120 mg/day have better treatment retention rates than doses below 60 mg/day. A review of 44 methadone programs in US found that dose level was the single most significant factor influencing treatment drop-out rates (Joseph et al., 2000).

A policy of urinalysis implementation in MMT programs works as a control system of secondary drug use, given the fact that usage of other opiates as well as non-opiate drugs are common among some individuals in MMT programs (Stitzer et al., 1982). Stitzer furthermore reported that a contingencies program which aimed to reduce the likelihood of illicit drug and alcohol use among methadone recipients had been

effective (Stitzer et al., 1986). In simple terms, clients have some consequences (either privileges or sanctions) based on their urine test results in order to reduce client's likelihood of concurrent illicit opioid use. This mechanism involves the structured integration of pharmacologic treatment (i.e. methadone), verbal-expressive forms and other behavioural interventions designed to reduce illicit use (Kidorf et al., 1999). The consequences may range from an opportunity to obtain increased dose levels, to have forced reduction in dose, to lose their take-home privilege (Iguchi et al., 1988). Some studies found that "positive" contingency management, where people receive privileges if they are abstinent but are not sanctioned if they have positive illicit drug use, had a positive correlation with treatment retention (Iguchi et al., 1988; Saxon et al., 1996). In contrast, the use of "negative" contingency management, where the dose level is determined by the urine results, was found to increase the likelihood of a higher drop-out rate (Fugelstad et al., 2007).

With regards to take-home privileges, Ball and Ross (1991) found that this policy should be primarily based on indicators of patients' treatment adherence, such as negative urine screens, attendance rate and employment. Take-home doses were a conditional privilege based on treatment progress. The number of take-home doses allowed per week was a significant predictor of treatment success, particularly reduced illicit drug use during treatment (Ball and Ross, 1991). Although this study did not relate take-home dose to treatment retention, a study of Pani and Pirastu (2000) found that allowing patients to have take-home doses increased the likelihood of remaining in treatment, particularly for those who have tight daily schedules and accessibility concerns. Prohibition of take-home privilege is correlated with a higher drop-out rate (Pani et al., 1996). Nevertheless, this program practice should be implemented very

carefully as it also increases the risk of methadone diversion into the black market (Pani et al., 1996).

In relation to clinic orientation, clinics with a strong abstinence orientation have greater drop-out rates compared to clinics with a harm reduction orientation (Caplehorn et al., 1998). Bell et al. (1995) found clinic orientation to be a mediator for the implementation of clinic policies / regulations, particularly dosing policy, and therefore clinic orientation is also an indirect predictor of treatment retention. Clinic orientation can be measured through staff attitude towards abstinence (Kang et al., 1997; Caplehorn et al., 1998). Although it is not related to treatment retention, some studies describe staff members' attitudes as influencing the quality of services in MMT (Ball and Ross, 1991; D'Aunno and Vaughn, 1992), while Hser et al (2004) and Booth et al (2004) found that service quality is a critical factor for retention.

Accessibility factors include service charge and travel distance or transportation. The following studies found that accessibility can be a significant barrier for heroin addicts remaining in treatment. If the clients have sufficient financial ability, either through their employment status (Borisova and Goodman, 2004) or through their health insurance (Deck and Carlson, 2005), their length of treatment tends to be longer. Moreover, free-treatment service attracts clients without financial capability to stay longer in treatment (Hser et al., 2001; Booth et al., 2004). Beardsley et al (2003) found that the shorter the distance between home and the clinic location, the lower the chance of drop-out, and in particular, having to travel a distance of less than one mile was related to longer treatment tenure. Transportation availability has also been found to significantly increase treatment retention (Friedmann et al., 2001).

2.4.1.2. Client characteristics

Some client characteristics predict treatment retention, including firstly, demographic factors such as age, gender and race, secondly, clinical backgrounds such as history of drug use and drug treatment, legal status and HIV status, thirdly, issues related to treatment motivation, and fourthly, psychological function of the clients, particularly depression status.

Several studies have shown that age consistently predicts treatment duration, where older clients are more likely to remain in treatment longer than younger clients (Sorensen et al., 1985; Saxon et al., 1996; Friedmann et al., 2001; Hser et al., 2004; Deck and Carlson, 2005). One explanation for this is the fact that older clients usually have a longer history of drug use and are more likely to have reached a “maturing-out” stage, where they feel tired of their addictive habits and more ready for treatment (Deck and Carlson, 2005). Another possibility is related to their being more likely to be a parent (Peles et al., 2005). Having status as a parent requires them to be more stable in order to raise their children, and this stability can be achieved if they remain in MMT.

Unlike age, gender is not a consistent predictor of treatment retention in MMT. Some studies show that males are more likely to stay longer in treatment (Hser et al., 2004; Deck and Carlson, 2005), while other studies report a reverse result (Hser et al., 2001; Beardsley et al., 2003; Kerr et al., 2005).

Studies that show any correlation between race and treatment retention are rare. Only two studies (Saxon et al., 1996; Friedmann et al., 2001) mention that whites are more likely to remain longer than Afro-American, while another study (Hser et al., 2001) describes higher retention rate of Hispanic clients than whites. However, these studies have a potential selection bias due to a non-random sampling strategy, and may not be extrapolable outside of the United States.

Clinical background related to drug use history, drug treatment history, legal status and HIV status have not been intensively studied. Two studies (Sorensen et al., 1985; Hiltunen and Eklund, 2002) show that clients with a longer history of using drugs tend to stay longer than those with a recent history of drug using. One study of street heroin injectors (Booth et al., 2004) found that previous experience in drug treatment was strongly related to treatment retention, while another study (Cacciola et al, 2005) found no difference. However, Gerra et al (2003) reported that individuals with experience of residential treatment tend to prematurely discharge themselves from MMT.

In term of legal status, a study from Saxon et al. (1996) reported that severity of legal difficulties predicted a higher drop-out rate, whereas two other studies (Hser et al., 2004; Deck and Carlson, 2005) reported that recent arrest history or involvement with the criminal justice system predicted longer treatment tenure.

HIV status predicts treatment retention inconsistently. In one study, persons who were seropositive (Grella and Wugalter, 1997) were more likely to drop out, while two other studies (Wimbush et al., 1996; Kerr et al., 2005) reported the contrary.

The third major client characteristic is treatment motivation. Many studies have shown that treatment readiness or high treatment motivation is an important predictor for longer period of treatment (Simpson et al, 1997; Joe et al., 1998; Joe et al., 1999^a; Longshore and Teruya, 2004). These studies found that clients who are ready for treatment show higher treatment engagement. Using another term, Hiltunen and Eklund (2002) found that clients' belief towards methadone treatment is the strongest reason for not quitting treatment. Patients who have a stronger belief that the program will have positive impacts on their life, stay in treatment longer. However other studies (Simpson et al., 1997; Joe et al., 1999) also found that treatment readiness was not the sole factor in influencing treatment retention. They found that processes during treatment that affect

the therapeutic relationship were more influential in predicting client retention in treatment. In the same study, Simpson et al state that “treatment process constructs” are much more important than clients’ characteristics in influencing time in treatment.

The last factor related to client characteristics is the clients’ psychological function. Research attention towards this issue has been particularly focused on depression status. Depression increases the likelihood of attending counselling sessions which indirectly affects duration in treatment (Joe et al., 1999), but some studies have shown that patients with depression tend to have a poorer outcome (Rousanville et al., 1982; Grella 1997). In particular, Grella reported that methadone recipients who had depression were more likely to drop-out of treatment earlier. How psychological problems affect treatment outcome seems related to the services provided that address these issues (Joe et al., 1995; Saxon et al., 1996). If the program provides appropriate mental health services, the likelihood of clients with mental health problems remaining in treatment appears higher.

2.4.1.3. Social characteristics

Social characteristics included family support and peer support. Studies addressing the influence of social factors on treatment retention are scarce, but some information is available. A study by Booth et al (2004) found that drug-using peers have a negative influence on treatment retention. Other studies found that having sufficient social supports, particularly from the family, increases the probability of remaining in treatment (Siddal and Conway, 1988; Dobkin et al., 2002).

2.4.2. Experience from Indonesia

Specific studies of factors affecting retention in substance abuse treatment programs have not been undertaken in Indonesia. To determine the factors that might act as predictors of treatment retention in Indonesia is not easy, but there are a few potential factors worthy of study. Evidence that attitudes towards MMT from many stakeholders (e.g. National Narcotics Board, health professionals, etc) is ambiguous and funding for drug treatment is very limited may affect the regulation and implementation of the clinics in providing their service. Regulations related to dosage and take-home privileges may be the primary predictor of treatment retention rate in Indonesia. Other additional possible predictors are treatment accessibility, family support and treatment satisfaction. Although not addressing treatment retention, the following information provides a bridging background to construct a conceptual framework of treatment retention in Indonesia, which can then be tested empirically.

2.4.2.3. Research of Chronic Diseases Treatment in Indonesia

Keeping patients with chronic disease such as diabetes and hypertension adhering to treatment regimens is challenging, even though adherence is critical for better outcomes (Littenberg et al., 2006). Various factors have been found to influence treatment adherence in the Indonesian context, and may also be important in adherence to MMT programs. A study by Fauziah (2001) in a general hospital in Yogyakarta, Indonesia, found that patients' income was significantly related to treatment compliance in hypertension cases. Another study of diabetic patient in a general hospital in Jakarta (Nomiko, 2002) showed that patients' knowledge of the importance of dietary management, along with family support, were both highly correlated to treatment compliance.

Other evidence of factors affecting treatment compliance in Indonesia comes from studies of tuberculosis (TB) medication and other medications. Sufficient knowledge about the disease and the medication significantly improved treatment adherence among TB patients (Hadi, 1999; Tarihoran, 2004) as did a positive perception of the program (Tarihoran, 2004). Other factors influencing treatment compliance included the distance between home and clinic (Amaliana, 2000; Noviani, 2001), family support (Hadi, 1999; Sihombing, 2000) and financial constraints (Rudiwan, 1983; Sihombing, 2000). Noviani (2001) also reported that new clients tend to drop-out more readily than experienced clients, while another study (Sudono, 2003) showed that more than 50% of patients who dropped out felt unsatisfied with the treatment service.

In general there were two main factors which affected the ability to comply with chronic disease treatment: first, treatment accessibility, which was reflected by the distance or financial capability to afford treatment, and secondly, family support. One qualitative study showed severity of mental illness can be prevented by a quick response of family members (Subandi, 2006). Based on clinical experience, it was obvious that having family support was also highly related to treatment accessibility, when the family take responsibility for treatment expenses. Forshee (2006) stated that it is a custom for Indonesians to refer to themselves as a part of extended family. Personal decisions for many important events tend to be driven by the family's opinion. Thus, it is quite common for the family to determine treatment plans (including the duration of treatment) for individuals (Rachma, 1997).

2.4.2.4. Quality of Health Service

The government of Indonesia has declared “Healthy Indonesia 2010” as the vision of health development. The indicators of this achievement are as follows: a). people living in a healthy environment and showing healthy behaviour; b). people able to afford quality health service that should be shared fairly; c). people owning their optimum healthy condition (Ministry of Health Republic Indonesia). To increase coverage of the health service, the government has developed 28,505 primary health centres (PHCs) all over Indonesia (ratio PHC of people is 1 : 27,000) and 1,145 hospitals (government and non-government) (Setyowati and Lubis, 2001). To assess the quality of the health service, the government has standardized health care components through accreditation. Nevertheless, up to the end of year 2000, only 27% of health providers had achieved this accreditation (Setyowati and Lubis, 2003).

Another study documented that health care quality in Indonesia in general was inefficient, showed lack of commitment and rated low in quality of service (Muninjaya, 2004). From the Indonesian household survey in 2001, it was found that dissatisfaction toward government hospitals was higher compared to other health provider (Setyowati and Lubis, 2003). Furthermore, this study also noted that patient dissatisfaction toward health providers in 2001 was double compared to that in 1998.

Studies of client satisfaction in RSKO Jakarta (Hendarjudani, 2004) and Sanglah Hospital Bali (Muninjaya, 2004) found a significant gap between clients’ expectations and service performance. Around 60% of clients in Jakarta felt unsatisfied with the services received in the outpatient and inpatient unit, while in the Bali site, there was 15.32% discrepancy of health care quality from the client’s perception. From these studies, there were several factors that significantly influenced the degree of client’s satisfaction. This included non-comprehensive facilities, poor punctuality, inefficient

service procedures and lack of staff responsiveness. Although the above studies did not assess the methadone maintenance program directly, however, they can describe the situation of other services in the participating hospitals.

A study from Ristrini (2001) described how a client's loyalty toward health providers was high if they were satisfied with the quality of service. Previous process evaluation of MMT in Indonesia clinics yielded the result that client satisfaction compared to other countries was lower at the third-month follow-up but then improved at the sixth-month follow-up (Uchtenhagen, 2006). Overall, these studies revealed that the quality of health services in Indonesia have not met patients' expectation.

2.5. Summary and conclusions

Studies conducted in western countries have shown that potential predictive variables of treatment retention have been studied and have shown variable correlations with treatment retention. Some factors such as age, dose and urinalysis policy have been thoroughly investigated and have shown consistent correlation, such that older age, higher dose and non-contingent urinalysis policy appear to influence treatment duration in a positive direction. Factors such as client beliefs toward the program, staff beliefs and attitudes toward addiction treatment, treatment accessibility and also drug-using peers influence toward treatment are less well studied, but have also shown a significant correlation with the duration of treatment in MMT. Other factors such as clinic orientation, take-home dose policy and service charge policy are also less studied but seem to work in an indirect way on the length of treatment. They affect other factors which contribute directly to treatment retention such as dosing policy. One factor which has not been a focus of attention in studies to date is family support. In general, western-

based studies show that program characteristics are more important in predicting treatment retention compared to other characteristics, including client characteristics

Lessons learned from Indonesian-based studies that have investigated chronic diseases suggest that factors such as treatment accessibility, family support and treatment satisfaction are significant predictors in influencing treatment adherence in other chronic disease states. After considering all this evidence, including government policy, previous methadone studies, the current situation of drug treatment seeking population and health service performance in Indonesia, there is support for investigating whether clinic regulations will act as the primary predictor of treatment retention of methadone maintenance therapy in Indonesia, followed by family support and treatment satisfaction.

Chapter 3

Methodology and Study Implementation Description

3.1. Introduction

This chapter describes the research methods that were implemented to collect the data. It includes research hypotheses, the conceptual framework, the study design, the recruitment process, ethical considerations, explanations of the study variables, the measurement techniques, and the statistical methods that were applied to analyse the data. Descriptions of the study process with regard to the recruitment procedure and the data collection process are also described later in this chapter.

3.2. Research Hypotheses

The research hypotheses were constructed and based upon the discussion of research issues in Chapter 1 and the review of literature in Chapter 2:

Primary hypothesis of the present study is that clinic regulations (program practices) through dosage and take-home dose practice will be the primary predictor of treatment retention of MMT in Indonesia, followed by family support through treatment attendance and treatment satisfaction as secondary predictors.

Secondary hypothesis is that remaining in treatment for at least a period of three months will reduce the participant's risky behaviour, namely heroin use and crime involvement, and also improve participant's physical health status compared to those who prematurely leave the program.

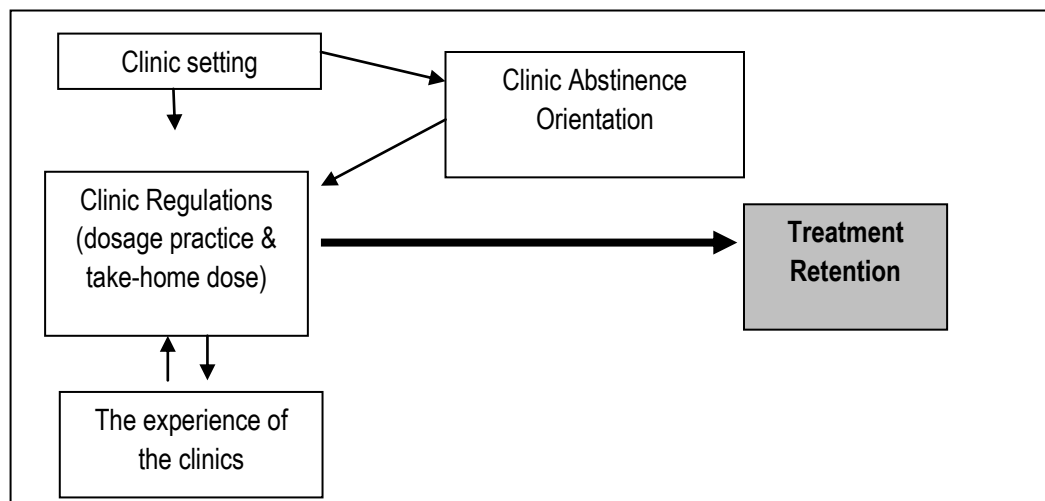
3.3. The Conceptual Frameworks

In accordance with the research hypotheses, the overall conceptual framework of this study can be expressed as three sub-frameworks, namely: a). Conceptual framework of Program Characteristics (Figure 3.1); b). Conceptual framework of the Client Characteristics (Figure 3.2); c). Conceptual framework of the Social Characteristics (Figure 3.3)). The overall conceptual framework of the study is shown in Figure 3.4. The three sub-frameworks provide a mechanism for determining variables for each characteristic that will predict treatment retention. The overall framework assists as the final conceptual framework to test the study hypotheses.

3.3.1. The Conceptual Framework of the Program Characteristics

The conceptual framework for Program Characteristics was built from information of previous studies and was modified contextually. It was hypothetically proposed that clinic regulations through dosage and take-home dose practices would strongly affect treatment retention. However, the effect of these variables on treatment retention would be influenced by other variables such as clinic experience, clinic setting and the orientation of the clinic towards abstinence. Clinic setting would not only influence clinic regulations but also the orientation of the clinic towards abstinence. Clinic setting would influence clinic regulations but also the orientation of the clinic towards abstinence.

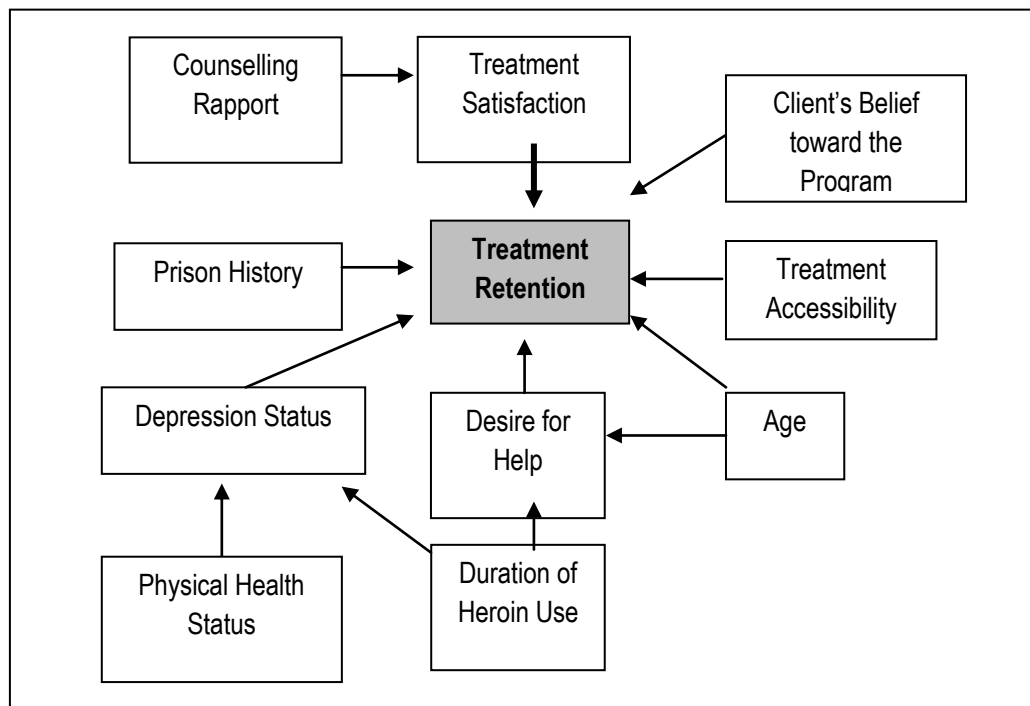
Figure 3.1. The Conceptual Framework of Program Characteristics



3.3.2. Conceptual Framework of the Client Characteristics

A conceptual framework of Client Characteristics was also developed from previous studies and modified contextually. Eight variables were identified which affected treatment retention, namely Treatment Satisfaction, Client's Belief towards the Program, Treatment Accessibility, Age, Desire for Help, Depression Status and Prison History. Among potential predictor variables, Treatment Satisfaction was hypothesised to be the strongest predictor. The effect of treatment satisfaction on treatment retention may also be affected by the level of counselling rapport. The effect of depression status on treatment retention was predicted to be affected by two major factors, namely physical health status and duration of lifetime heroin use. Moreover, the effect of the client's desire for help on treatment retention would be influenced by their age and duration of lifetime heroin use. Other potential predictive variables would affect treatment retention independently.

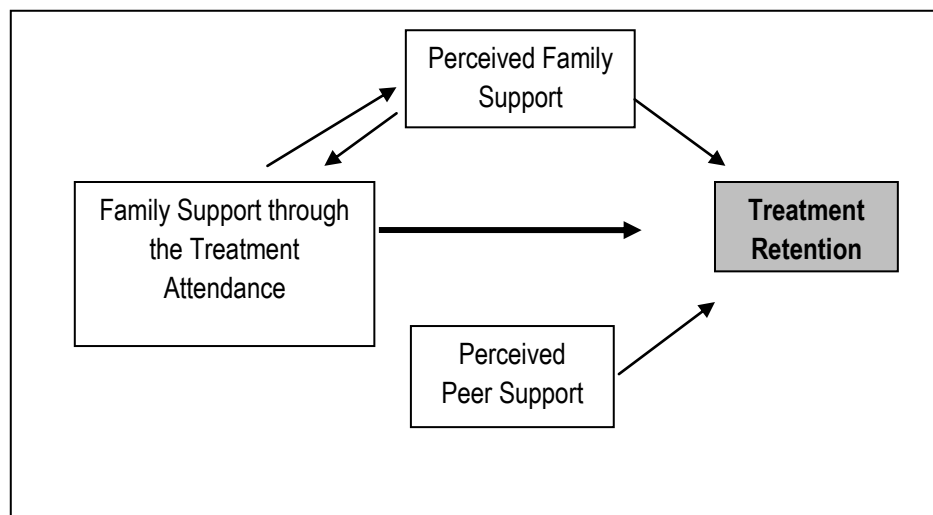
Figure 3.2. The Conceptual Framework of Client Characteristics



3.3.3. Conceptual Framework of the Social Characteristics

In the case of social characteristics, previous studies have not explored in detail the role of family support as a major determinant of treatment retention. This conceptual framework was based on clinical observations and a few studies conducted in Indonesia on family roles (Rachma, 1997; Sarasvita, 2002). The current study measured family support from two different sources. Firstly, the client's case notes, which documented family's attendances when accompanying the client for a take home dose and/or attending a counselling session. Secondly, a self-administered instrument which measured the client's perception of the level of family support. It was predicted that Family Support through Treatment Attendance assistance would have a correlation with Perceived Family Support. Higher perception on family support will predict higher family involvement in treatment attendance and vice versa. Other potential predictive variable from social characteristics was Perceived Peer Support.

Figure 3.3. The Conceptual Framework of Social Characteristics

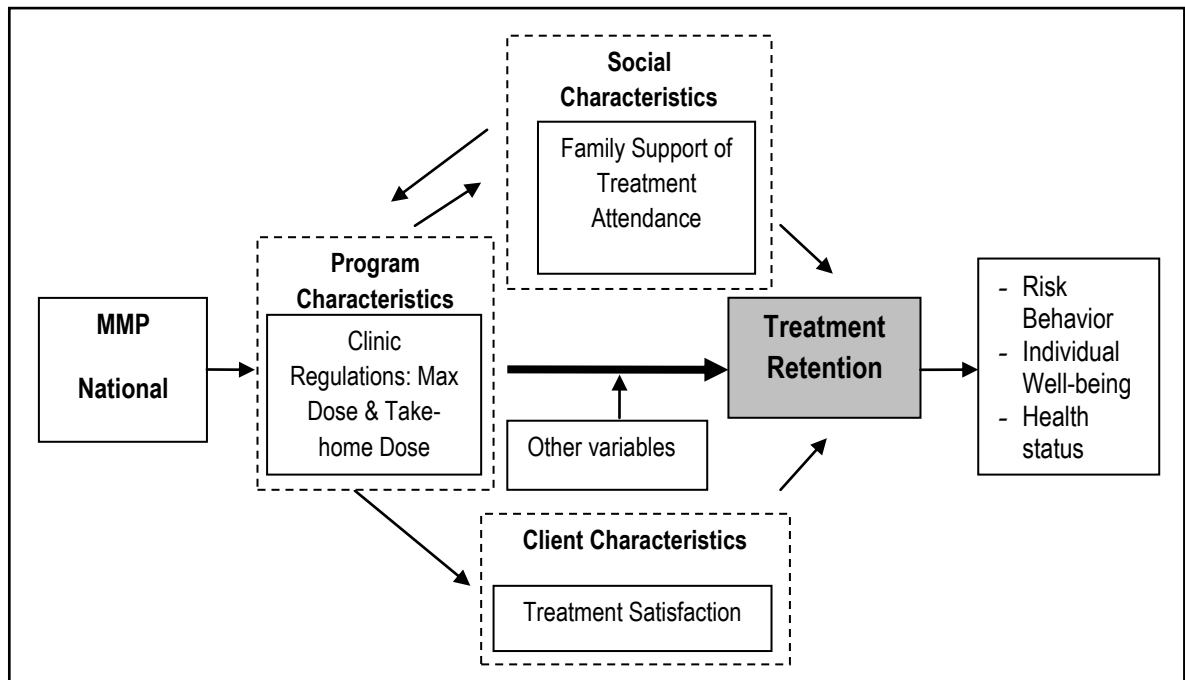


3.3.4. Conceptual Framework of the Overall Characteristics

The overall conceptual framework of the study was constructed in two interrelated conceptual frameworks. The first framework conceptualized the predictor variables of treatment retention in a methadone maintenance program while the second conceptualized

the significance of treatment retention in changing the client's behaviour and perception. This study mainly focused on the first framework, while analysis of the second framework was performed to support existing studies which mentioned treatment retention as important in changing risky behaviours (Simpson, 1981; Simpson, 2004; Darke et al., 2005).

Figure 3.4. Conceptual Framework of the Overall Characteristics



The first framework was built from previous studies that found the Program, the Client and the Social Characteristics were significant predictors of MMT treatment retention (Ball and Ross, 1991; Hser et al., 2004; Dobkin et al., 2002). As was mentioned in study issues in Chapter 1 (page 12-13), in Indonesia, the important predictors have been hypothesised to be Clinic Regulations or Program Practices through methadone dosage and take-home dose practice. Other significant predictors were hypothesised to be Family Support through assisting Treatment Attendance and Treatment Satisfaction. All of these predictors may have a direct effect on the outcome of treatment duration. Other factors may have an indirect effect or alter the effect size of the primary variables on treatment retention (Figure 3.4).

The second framework, derived from previous studies (Darke et al., 2005; Simpson, 1981), conceptualized duration of treatment influencing the client's behaviour and health status by decreasing risky behaviour, criminal activities, and depression status. In the current study, this conceptual framework provided a basis for analysis of the interconnection between these variables.

3.4. Research Methods

3.4.1. Study Design

The study consisted of two components. At the clinic level, the study consisted of a cross-sectional survey of the clinic directors and their staff. Data was collected using a structured face-to-face interview of clinic's directors at the beginning of the study period. Concurrent with the interview of the clinic directors, a self complete questionnaire was distributed to all clinic staff.

At the client level, a six-month prospective observational cohort study was conducted, with longitudinal follow-up and measurement of specific outcomes. For this study, the primary outcome was treatment retention or the duration they remained in the MMT program (in days). Two groups were identified for comparison: a retention group consisting of participants who remained in treatment over the course of the study observation period and a dropout group consisting of participants who dropped out from the program within the study period.

Each participant (both those who remained in the program and those who dropped out) who enrolled in the study was attempted to be interviewed at three different times: at baseline and at three and six months after the initial recruitment. Follow-up assessments for participants who remained in the program were undertaken in the clinics, while dropouts (whenever possible) were interviewed through two options: at the clinic or home visit.

Additional client data were accessed from the case notes and documented by appointed clinic staff.

3.4.2. Study Population and Participants

At the clinic level, the study included all of the existing methadone maintenance clinics within Indonesia. In July 2005, there were two long-standing MMT clinics: RSKO and RS Sanglah and one new clinic: Tanjung Priok. These MMT clinics, including all of the staff, were included in the study.

At the client level, the study population was all methadone patients in RSKO clinic, Tanjung Priok clinic and Sanglah clinic who were enrolled in MMT within the study time line and met inclusion criteria.

Study participants at the client level met the following criteria. Inclusion criteria were:

- 1) Enrolled in current methadone maintenance program within the last two weeks
- 2) Aged between 18 and 65 years;
- 3) Mentally competent (as judged by a clinician) to give an informed consent;
- 4) Physically well enough to participate in the study assessment;
- 5) Willing to provide consent to participate in the study;
- 6) Willing to undergo follow-up assessments at the 3rd and 6th months;
- 7) If applicable, any previous substitution therapy ceased for more than 5 days before joining the most current methadone program.

Exclusion criteria were:

- 1) Severe cognitive impairment or mental retardation;
- 2) Severe behaviour disturbances or psychotic symptoms;
- 3) Unable to attend the treatment facility for the duration of the study period, e.g., those with pending criminal charges;

- 4) Medical condition that might require hospitalisation;
- 5) Pregnant

For the recruitment process, an eligibility checklist was administered by clinic staff to all potential study participants, following their presentation to the treatment clinic. Research staff, independent of the treatment program, then discussed the study in greater depth with the potential participants, and went through the informed consent provisions. Potential participants were approached to enter the study in the first two week of their treatment when they were no longer experiencing withdrawal symptoms. Participation in this study was voluntary.

Previous studies found the drop-out rate at 6 months in Jakarta clinics was 38 percent, thus, to have power of at least 0.8, with a significance level of 0.05, the study needed to recruit about 152 participants, with 76 participant for each group (those who remained in program and those who dropped out from program).

3.5. Ethical Considerations

This study received ethical clearance from the Human Research Ethics Committee of the University of Adelaide (approval number H-156-2005) and from the Indonesia Local Ethic Committee “Komite Etik Badan Litbangkes Departemen Kesehatan Republik Indonesia” (National Institute of Health, the Ministry of Health, Republic Indonesia) (approval number KS 02.01.2.1.2211).

3.5.1. Human Subject Protection

Before study enrolment, all of the potential participants received an explanation of the risks, benefits, and study procedures by the research staff at the study site. Those who agreed to participate in the study were asked to sign a consent form, following

resolution of any questions, and only if there was a clear indication that they understood the nature of the study.

Participants were informed that their involvement in the study would not interfere with their treatment, and nor would their treatment be affected in any way should they choose to withdraw from the study. Participants were also informed of their right not to answer any questions that they did not wish to. In addition, participants were asked to give their consent to:

- allow research staff to contact participants at the 3rd month and the 6th month follow-up assessments (based on contact information provided by the participants on the geographic locator forms);
- allow research staff to access the participant's case notes to record any necessary data related to the study, including urinalysis results and HIV status (if applicable).

3.5.2. Health Care Management

In participating clinics, standard health care procedures for HIV positive clients were implemented for the research participants who were HIV positive. If they needed other services not available in their MMT clinic, with their consent, they were referred to other hospitals/institutions. This procedure also applied to research participants who had physical or emotional problems not related to HIV but needed further management.

3.5.3. Confidentiality

All data collection was subject to privacy laws and procedures adopted by the participating clinics. Participants had been assured of the confidentiality of their responses, and efforts were made to ensure all interviews were conducted in a private place.

Collected materials, such as responses to questionnaires were maintained in a numbered reference system, and the name of participants only appeared on their consent form and “locator” form. The consent and locator forms were stored in a locked filing cabinet separate from other research materials. Access to the participant’s data was restricted to authorised personnel.

3.5.4. Risks and Benefits

Risks of this study were very few. Firstly, in relation to the participant’s confidentiality, every effort has been made to ensure confidentiality. Secondly, participants could refuse to answer the questions that made them feel uncomfortable.

There was no direct benefit for the study participants regarding their individual treatment. However, their participation provided valuable inputs for potential service quality improvements and the national drug treatment policy.

3.6. Variables of the Study

3.6.1. Variables of the Primary Hypothesis

The primary outcome variable of the study was the duration study participants remained in the MMT program (also called treatment retention). Possible predictor variables of interest were categorized into three characteristics: a) Program Characteristics; b) Client Characteristics and c) Social Characteristics.

Predictor variables within the Program Characteristics included the Clinic Regulations (dosage practice and take-home dose practice), the Clinic Orientation to Abstinence, Clinic Setting, and the Experience of the Clinic in treating the drug users. The main variable of interest in this group was the Clinic Regulations.

Predictor variables within the Client Characteristics included Age, Imprisonment History, Lifetime Heroin Use, Physical Health Status, Treatment Satisfaction, Treatment Need, Pressure for Treatment, Self Efficacy, Treatment Participation and

Belief towards Program. The main variable of interest in this group was Treatment Satisfaction.

Predictor variables within the Social Characteristics included Family Support through assisting Treatment Attendance (called Actual Family Support), Perceived Family Support, Perceived Peer Support and Perceived Community Support. The main variable of interest in this group was Actual Family Support.

3.6.2. Variables of the Secondary Hypothesis

The two comparison groups to examine the secondary hypothesis were: the group of participants who remained in the program over the study period and the group of participants who dropped out of treatment during the study period. Outcome variables for the secondary hypothesis were Drug Use, Crime Status, Physical Health Status, Treatment Motivation, Psychological Functioning, Social Functioning, Social Support and Belief.

3.7. Definition of variables

3.7.1. Outcome Variables of the Primary Hypothesis

- Treatment Retention was the duration for which the study participants remained in the program (in day) within the 6 months observation time. Study participants who remained in treatment to the end of the observation time were categorized in the dataset as zero (0) and study participants who dropped-out within the observation period were categorized in the dataset as one (1).
- Dropping-out of the Treatment Program was defined as the absence of daily dosage of methadone for a minimum of five consecutive days.

3.7.2. Predictor Variables of the Program Characteristics

- The Clinic Regulations or Program Practices were defined by the level of each clinic's dispensing practices that included dosage level and take-home dose practices. Based on previous studies, the maximum methadone dose dispensed to a participant was treated as a dichotomous variable: low dose (≤ 60 milligrams) and high dose (> 60 milligrams) (Joe et al., 1999; Dole, 1988; Joseph, et al., 2000). The number of take-home doses (THD) over the 6 month observation period was counted as a continuous variable. The range of THD fell between zero (no THD) to 120. To enable THD to be used as a predictor variable for treatment retention, particularly for dropouts, it was necessary to check against the representativeness of the data. Thus, for this study, the period of last 30 days prior to follow-up interview was used as the timeline to measure THD, with this period also covering the dropouts. The determination of this period was also based on the national guidelines which required a client to be in treatment a minimum of two months before having a THD.
- The Clinic Setting was defined by the venue where the methadone clinic was nested: either hospital or primary care. Hospital-based clinics had a psychiatrist as the clinic coordinator, while primary-health-care (PHC) clinics had a General Practitioner as the clinic coordinator. There were usually more than ten clinic staff in the hospital-based clinic while there were less than seven staff in the PHC-clinic.
- The Clinics Orientation to Abstinence was reflected by the perception of the majority of the clinic staff of the desirability of an abstinence state among methadone clients. Statistical analysis using Kruskal Wallis test was used to check the differences in staff attitudes in the clinic. If the differences were significant, a cluster analysis based on means was performed to classify counsellor's orientation

into groups either favouring abstinence or maintenance. Participating clinics were categorized as having an abstinence orientation (abstinence) if the majority of the clinic staff had an abstinence orientation and were categorized as having a maintenance orientation (maintenance) if the majority of the clinic staff had a maintenance orientation. If the differences were not significant no categorization of clinic-based orientation was recorded.

- Experience of the clinic was defined as the length of time the clinic had provided methadone treatment. This also reflected the level of clinic's knowledge and expertise in treating injecting drug users. Experience based on a period of one year was categorized dichotomously as either a new clinic or an experienced clinic.

3.7.3. Predictor Variables of the Client Characteristics

Some of potential predictor variables from Client Characteristics were obtained from the interviewer-administered instrument (appendix f) and some were obtained from the self-administered instrument (appendix g). A detailed description of the instruments occurs later in this chapter.

The definitions of the Client Characteristics predictor variables are as follows:

- Treatment Satisfaction was defined as the level of satisfaction the participant expressed towards the program. This variable was measured by a self-administered instrument consisting of seven (7) items including clarity of program rules, program practice, punctuality, and relationship between clients and clinic staff. The total weighted score of this variable was treated as a continuous variable.
- Client's age was treated as a continuous variable.
- Imprisonment History was defined as participants prior history of incarceration. It was classified into two categories: a) ever been in prison and b) never been in prison.

- The Physical Health Status was based on the total numbers of subjective physical symptoms that had been experienced by the individual participants prior to the treatment. These symptoms were measured by the Indonesian version of the Opiate Treatment Index (OTI) instrument. This instrument consists of seven domains for males and eight domains for females, namely general physical status, injection related problems, cardio/respiratory status, genitourinary status, gynaecological status (for female only), musculoskeletal status, neurological and gastro-intestinal status. Participants were asked whether they experiencing physical complaints related to those domains in the 30 days prior to interview.
- Duration of Heroin Use (Lifetime Heroin Status) was a continuous variable based on the total duration of heroin use measured in years.
- Treatment Need was measured by the degree participants perceived treatment as necessary. This variable was measured by a self-administered instrument consisting of five (5) items. The total weighted score of this variable was treated as a continuous variable.
- Pressure for Treatment was quantitatively measured by the level of participants' perception on external pressures to join MMT. This was measured by a self-administered instrument and consisted of six (6) items. The total weighted score for this variable was treated as a continuous variable.
- Self Efficacy was measured by the level participants perceived of their ability to control their life. This was measured by a self-administered instrument and consisted of seven (7) items. The total weighted score for this variable was treated as a continuous variable.
- Treatment Participation was measured as the level participants perceived of their participation in the program. This variable was measured by a self-administered

instrument and consisted of twelve (12) items. The total weighted score for this variable was treated as a continuous variable.

- Belief towards the Program was measured by participant's belief that the methadone therapy would work for him or her. This variable was measured by a self-administered instrument that consisted of eight (8) items. The total weighted score was treated as a continuous variable.
- Treatment Accessibility was measured by the level participants perceived that treatment was accessible, based on financial capability and time availability. This was measured by a self-administered instrument that consisted of four (4) items. The total weighted score was treated as a continuous variable.

3.7.4. Predictor Variables of the Social Characteristics

Potential predictor variables from Social Characteristics were collected from two sources: the clients' case notes and the self-administered instrument. The definitions of predictor variables from Social Characteristics are as follow:

- Family Support through assisting Treatment Attendance (called Actual Support) was defined by the frequency of the family members' attendance at the clinic, either to attend for take home doses and/or attend counselling sessions. The data were obtained from the clients' case notes. Regardless of the family attendance intention, the total score was derived from the total number of family attendances. This score was treated as a continuous variable.
- The Perceived level of Family Support was the level of support participants perceived their family was giving for their treatment program and positive life-style. This variable was measured by a self-administered instrument consisting of six (6) items. The total weighted score was treated as a continuous variable.

- The Perceived level of Peer Support was the level of support the participant perceived their friends were giving for their treatment program and positive life-style. This variable was measured by a self-administered instrument consisting of twelve (12) items. The total weighted score was treated as a continuous variable.
- The Perceived Community Support was the level each participant perceived that his or her social environment was conducive and supportive towards their treatment program and their positive life-style. This variable was measured by a self-administered instrument consisting of seven (7) items. The total weighted score was treated as a continuous variable.

3.7.5. Comparison Groups of the Secondary Hypothesis

- “The Continuing in MMT” group were participants who remained in the program and didn’t drop out during the study period
- “The Dropouts” group were participants who dropped out at least once during the study period

3.7.6. Outcome Variables of the Secondary Hypothesis

- Drug Use was defined as participants’ days use of alcohol, heroin, methadone illegal, other opiates, sedatives and cannabis in the last 30 day period prior to each review
- Crime Status was defined as number of criminal involvements in the 30 day period prior to each review
- Physical Health Status was assessed by the participants’ number of physical symptoms in the 30 day period prior to each review
- Treatment Motivation was assessed by the participants’ score on Desire for Help status, Treatment Readiness status, Treatment Need status and Pressure for Treatment status at 30 days period prior to each review

- Psychological Functioning Scale was defined as participants' score on Desire for Help, Treatment Readiness, Treatment Need and Pressure for Treatment in the 30 day period prior to each review
- Social Functioning was defined as participants' score on Hostility, Risk Taking and Social Consciousness in the 30 day period prior to each review
- Social Support was defined as participants' score on the perception of Peer Support outside MMT, Family Support and Community Support in the 30 day period prior to each review
- Belief was participants' score on their perception of three statements about treatment duration, treatment expansion and treatment recipients, in the 30 day period prior to each review

3.8. The Measurement & Procedures of Data Collection

The instruments for this study at the clinic and the client levels were chosen according to the following guidelines:

- a) met a standard for internationally used assessments in order to maximise comparability of findings with other studies;
- b) linkage to specific opioid substitution treatment hypotheses;
- c) suitable psychometric properties;
- d) if applicable, known reliability and validity.

3.8.1. Personnel

Data collection at the clinic level was performed by the primary researcher of this study, while for the client level, three independent teams of interviewers were set-up for three sites: RSKO, Tanjung Priok and Sanglah. Each team consisted of two independent interviewers who were not clinic staff (except for Sanglah) and one administrative staff –who was clinic staff- to input records for the participants. Due to practical and logistic

reason, interviewers in Sanglah were also General Practitioners who usually manage new MMT client's admittance. The Sanglah's Clinic Coordinator chose them as interviewers based on the consideration that they could maintain their independence as they were not involved in the counselling process. The interviewers were health professionals (General Practitioner, Nurses and Psychologist), with sufficient experience in treating drug users. The Sanglah team consisted of a female interviewer, as did RSKO, while Tanjung Priok consisted of two males and one female.

Two weeks prior to data collection commencement a one day training for all interviewers was undertaken. The training included a trial data collection session with clients from the study population. Any obstacles in understanding and administering the instruments were discussed.

Different approaches were used in Jakarta and Bali to collect the data from participants who dropped-out and could not visit the methadone clinics. In Jakarta, follow-up interviews for these participants was undertaken by the male interviewers – regardless participants' clinic. In Bali, follow-up interviews for these participants was undertaken by an additional male interviewer –who was a peer educator from the Sanglah clinic. The reason for implementing this approach was based on the fact that female interviewers had many obstacles to reach these participants. Some of the participants who dropped-out were in jail, detention centres or brothels when the follow-up review was due.

One computer programmer who had experience in a previous Methadone Study was hired to setting-up the data template and data entry. Cleaning the data was the responsible of the primary researcher.

3.8.2. Instruments and Data Collection at the Clinic Level

At the clinic level, three instruments were used for the data collection: a) the Performance Checklist on Program Implementation (PC2) for the clinic directors, b) the Self-administered Inventory for clinic staff and c) the Client Attendance Sheet.

The Performance Checklist (PC2) (appendix i) were taken from a previous WHO Collaborative Study of Substitution Treatment of Opioid Dependence and HIV (Ali et al, 2005), in which RSKO, participated. PC2 asked about service description of the methadone maintenance therapy at the clinic level. Analysis of this instrument was primarily qualitative, based on a content analysis approach.

The self-administered inventory for the clinic staff entitled Counsellor Attitudes Survey (CAS) in Methadone Maintenance was derived from a study by Kang et al. (1997),. This instrument was also used in a methadone study in Indonesia (Ali et al., 2005), thus had been translated into Indonesian language (see section 3.8.6). It consists of six scales and measures counsellor's attitude towards drug addiction, abstinence orientation, strictness of attitude toward methadone program policies, opinions about patients, medical knowledge about methadone and satisfaction in the work environment (Kang et al., 1997). The Cronbach α of its reliability was varied between 0.53 (for opinion about patients) to 0.88 (for abstinence orientation of the methadone program).

Scoring of the Staff Self-administered Instrument was performed by summing the item responses of each scale (adjusting for the directionality) and taking the average for all items as the total score or weighted score. A mean of the weighted score was used to distinguish them into two categories: score less than the mean or greater than or equal to the mean. The category below the mean is referred to as lesser tough-minded towards drug addiction, more maintenance orientation, less strict about methadone policies, more positive opinion about patients and correct medical knowledge, whereas the category same as or above the mean is referred to as the opposite attitude and

knowledge. The clinic orientation was determined based on the mean value of the majority of the clinic staff.

A client attendance sheet was developed based on the clinic's case notes. It consisted of data related to attendance dates, missed doses, dispensed doses, attendance at counselling sessions, related physical complaints status, family attendance, and take-home dose privileges. The appointed clinic staff members were responsible for filling out this sheet based on participant's case notes for the 6 months observation period. Analysis of this data was primarily qualitative, based on content analysis.

Table 3.1 Matrix of Study Instruments at the Program Level

Determinants	Domain	Protocol / Instruments	Data administrator
Program Characteristics	Service description and service performance	The performance checklist: PC2 (WHO Collaborative Study, 2005)	Interviewer of clinic director
	Clinic orientation	Self-administered instrument for clinic staff	Clinic staff
	Program practices	Clients' Attendance Sheets	Appointed clinic staff
Social Characteristics	Family support	Clients' Attendance Sheets	Appointed clinic staff

3.8.2.1. Procedures

The clinic interview checklist was only administered once for the long-standing clinics, RSKO and Sanglah clinics, as the clinic regulation and performance in these clinics remained stable over the study period. For the newly established methadone clinic, Tanjung Priok, the checklist was administered twice: at the baseline and one year later. The reason for repeating the interview was to identify whether this clinic had made modifications regarding clinic regulations. The interview of the program directors required approximately one hour for each session.

The self-administered inventory for the clinic staff was administered once during the study period at all clinics. On average it took fifteen minutes to complete this inventory.

The client attendance sheets were completed by the appointed clinic staff on a daily basis. The appointed clinic staff extracted the information from the case notes, without making any intervention within the source documents.

All participants at the program level received compensation for time spent completing the questionnaires and/or interviews and/or documentation time. The clinic staff received Rp. 25.000, and the clinic director received Rp. 150.000. Data collection at the program level was executed by the primary researcher responsible for this study, except for the Client Attendance Sheet.

3.8.3. Instruments and Data Collection at the Client Level

All the study participants at the client level who agreed to enter the study were asked to complete the Consent form and the Locator form (contact tracing). The later was used for information to contact the participants for the follow-up interviews. After filling out these forms, they received two types of inventories: the interviewer-administered and the self-administered:

- The Interviewer-administered Inventory consisted of general information regarding participation in MMT, demographic information, drug use history, drug treatment history, health status, legal status, self-reported heroin use and treatment accessibility.

Most of the questions (demographic, drug use, health and legal status, self-report of heroin use) were derived from the WHO Collaborative Study of Substitution Treatment of Opioid Dependence and HIV (Ali et al, 2005).

For the drug use history, questions about the first age of drug usage and the first age of drug injection were taken from the Texas Christian University (TCU) Methadone Intake Form of the Institute of Behavioural Research – TCU (Simpson, 1998). General information regarding participation in MMT was developed by the researcher and the expert panel.

The treatment accessibility questions were derived from a study on cost evaluation of drug use in Indonesia (Centre for Health Research, University of Indonesia, 2004).

Analysis of the interviewer-administered instrument was consistent with the Protocol of the WHO Collaborative Study of Substitution Treatment of Opioid Dependence and HIV (Ali et al, 2003).

- The Self-administered Inventory consisted of two parts: 1) Visual Analogue Scales (VAS) to measure subjective feelings on the current methadone dose and 2) the Subject Evaluation of Self and Treatment (SEST). These two parts were combined into one questionnaire.

The VAS part of the self-administered instrument consisted of seven independent items, each with a scale ranging from 0 to 100 mm (a visual Likert scale). Each subject was asked to document their status related to the question by ticking the appropriate point on that scale. Analysis of this instrument was based on a measurement of the actual point at which the tick was placed on the continuous scale, expressed in millimetres.

The SEST, which formed the second part of the self-administered instrument, was constructed mostly from the Client Evaluation of Self and Treatment (CEST) of the TCU Methadone Outpatient Forms (Simpson, 1998). The CEST has been shown previously to have high reliability, with coefficient α from confirmatory analysis between 0.71 and 0.96 for each domain (Simpson, 1998). Items related to

social support were added using an existing instrument called the Community Assessment Inventory (CAI) (Brown et al, 2004). Social support included peer support, support from family members living with the client and community support. The CAI instrument has also been shown to have a high reliability, with coefficient α from confirmatory analysis ranging between 0.79 and 0.88 for each domain. The correlation between scales ranged from 0.31 to 0.54, meaning that each domain measured overlapping but different social network supports (Brown et al, 2004). Items related to client's belief towards program were based on the Abstinence Orientation Scale (AOS) (Caplehorn et al, 1998). Several items on AOS that seemed relevant for the clients were taken and then added by other new items by the researcher (appendix h). These items validity had been tested prior to data collection and yielded p-value less than 0.05, except for the statement that "*methadone recipients are loser*" (p-value 0.842). However, all tested items were included in the final instrument with the objective of the results being comparable with the previous study (Simpson, 2005).

Overall, the Self-administered Inventory consisted of six scales: Treatment Motivation; Psychological Functioning; Social Functioning; Therapeutic Engagement; Social support and Treatment Accessibility. Apart from Treatment Accessibility, all other scales incorporated several subscales. The Treatment Motivation scale consisted of four subscales, namely the Desire for Help; Treatment Readiness; Treatment Needs; and the Pressures for Treatment. The Psychological Functioning scale consisted of five subscales, namely Self Esteem; Depression; Anxiety; Decision Making; and Self-Efficacy. The Social Functioning scale consisted of three subscales, namely Hostility; Risk-Taking; and Social Consciousness. Originally, the Therapeutic Engagement scale consisted of three subscales, namely Treatment Satisfaction; Counselling Rapport; and Treatment

Participation (Simpson, 1998). For this study, Belief in Treatment was added under the scale of Therapeutic Engagement. The original Social Support scale of the TCU consisted of two subscales: Peer support and Social support. In this study, a subscale for family support from the CAI instrument was added into the scale of Social Support.

Scoring of this second part of the self-administered inventory, which was based on a five-point Likert scale, was carried out as follows: *a) numbers of each item indicate its location in which response categories are 1=Strongly Disagree to 5=Strongly Agree (with (R) designating items with reflected scoring); b) scores for each scale were obtained by summing responses to its set of items (after reversing scores on reflected items by subtracting the item response from “6”); c) an average score for each scale was derived by dividing the sum by the number of items included followed by multiplying by 10 in order to rescale final scores for the range of 10 to 50 (Scales and Item Scoring Guide TCU, 2005). A higher score reflected a higher degree for each measured subscale.*

Table 3.1 Table of study instruments at the client level

Stages of Data Collection	Domain	Protocol/Instruments	Data administrator
Baseline	Screening, Informed consent, Contact traces	General eligibility screener, Information sheet, Consent form, Locator form	Interviewer
	Demographic data, Drug use history, Drug treatment history, Self-report opiate use, Legal status, Treatment accessibility	Interviewer-administered questionnaire	Interviewer
	Subjective feeling on current methadone dose, Subject evaluation of self and treatment	Self-administered questionnaire	Study participants
Follow-up assessment	Contact traces	Information sheet, Locator form	Interviewer

at 3 month	Demographic data, Drug use history, Drug treatment history, Self-report opiate use, Legal status, Treatment accessibility	Interviewer-administered questionnaire	Interviewer
	Subjective feeling on current methadone dose, Subject evaluation of self and treatment	Self-administered questionnaire	Study participants
Follow-up assessment at 6 month	Demographic data, Drug use history, Drug treatment history, Self-report opiate use, Legal status, Treatment accessibility	Interviewer-administered questionnaire	Interviewer
	Subjective feeling on current methadone dose, Subject evaluation of self and treatment	Self-administered questionnaire	Study participants

The set of questions in the Interviewer-administered Questionnaires and Self-administered Inventory was translated into the Indonesian language following standard translation and instrument adaptation procedures (see section 3.8.6).

3.8.3.1. Procedures

Prior to data collection, the interviewers explained the broad purpose of the interview and the general nature of the questions and provided an information sheet to the potential participants. Those who agreed to join the study and understood the nature of the study continued to the next step of the process. The form for determining whether clients met the inclusion criteria was administered first, as it formed part of the eligibility screening process. The participant's basic information was then gathered, including the detailed locator information which was used to follow-up participants at the 3rd and the 6th month. The Interviewer-administered Inventory was executed afterward, followed by the Self-administered Inventory. Regular breaks and refreshment were offered during the interview session.

Baseline data collection took longer than the follow-up data collection. In general, the baseline assessment battery required 60 to 90 minutes to complete, while the follow-up assessment battery required 45 to 60 minutes.

The participants received compensation for their participation at baseline, the 3rd month and the 6th month interviews. Each participant received Rp. 20.000 per interview session, adding up to a total of Rp. 60.000 across the 6-month period as compensation for their time, travel and any inconvenience occurring during the data collection.

3.8.4. Measurement of Illicit Drug Use

Due to budget constraints, in the present study, there was no biological samples or other objective measures of heroin use. Analysis was based solely on participants' self-reports, recognising that self-report techniques have previously been shown to be valid in detecting illicit drug using (Joe et al., 1991; Saxon et al., 1996). The self-report questions were administered at baseline, at the 3rd and the 6th follow-up assessments. To minimize potential bias of this approach, research staff were independent from the treatment program and their responses did not affect the quality of treatment they received. Furthermore, if available, this study also collected secondary data from urine drug test results from the clients' case notes. The disclosure of urinalysis results was voluntary and was included in the participant's consent (see section 3.3.6.1). The intention of reviewing the clinic urinalysis results was to check the validity of the self-report method.

3.8.5. Measurement of HIV Status

In this study there was no biological sampling to assess HIV status. The participants were encouraged to undertake HIV counselling provided by the clinic, and their decision to have HIV testing was entirely voluntary. HIV status was extracted from two sources: firstly, from the participant's self report and secondly, from the

client's case notes. The disclosure of HIV status was voluntary. Nevertheless, any documentation of HIV status in the client's case notes was collected for this study.

3.8.6. Process of the Translation and the Adaptation of the Instruments

Instruments for the study participants, particularly the Self-administered Inventories for the clinic staff and the clients, were translated and adapted following the WHO protocol of translation and adaptation of instruments (World Health Organization, 2008). The Interviewer-administered Inventory for the client also went through the translation and adaptation process following the same standard in the previous study (Ali et al, 2003).

The aim of this process was to develop an Indonesian language version of the English instrument that was conceptually equivalent in the Indonesian language. That is, *“the instrument should be equally natural and acceptable and should practically perform in the same way. The focus was on cross-cultural and conceptual, rather than on linguistic/literal equivalence”* (World Health Organization, 2008).

Implementation of this method included the following steps:

- Forward translation
- Expert panel back-translation
- Pre-testing and cognitive interviewing
- Final version

A pilot phase to check conceptual understanding of the instruments was conducted for the instruments at the client level, especially the newly translated and modified instruments. It involved 5 clients from the study population. Data from the pilot study were not included in the final analysis.

The translated instrument for the clinic staff was not piloted because the expert panel regarded the instrument as easily understood.

3.9. Methods of Analyses

All data were statistically analysed using Stata version 8. An α level of 0.05 was set to determine the significance of the data results. Various measures were implemented in the present study:

- a. **Descriptive statistics** using univariate approaches described the study population and measures of the central distribution and variance of participant characteristics, participant's subjective feeling on methadone dose and evaluation of self and treatment. Descriptions covered each data collection phase: baseline, three-month follow-up and six-month follow-up. This study also applied tests of equality across strata to explore whether or not to include variables as potential predictors in the final model. Application of univariate analysis to explore potential variables used the log-rank test of equality for categorical variables and a univariate Cox proportional hazard regression for continuous variables (UCLA, 2008).
- b. **Bivariate analysis:** comparison and/or correlation among variables for the continuous variable used paired t-tests and Pearson's test where data were normally distributed or Wilcoxon signed rank sum tests or Spearman tests for nonparametric distribution. Comparison and/or correlation of categorical variables used Mann-Whitney U-test or a chi-squared test depending on how many categories applied to each variable or Fisher's exact test if cells had a frequency of five or less (Rabe-Hesketh and Everitt, 2007; UCLA, 2008).
- c. **Multivariate analysis:** To examine treatment retention rate and its predictors, survival analysis was chosen because the outcome variable was the time of an event (dropping-out of MMT) and there may be censored data (Kleinbaum and Klein, 2005). Because the event of interest (drop-out) can occur several times during the course of the study and because recurrent events were treated as identical, Counting Process Approach which focused on the Cox PH model was used in the analyses

(Kleinbaum and Klein, 2005). Survival analysis can accommodate different intake and endpoints of study participants better than other regression procedures and also allows possible confounders to be added as covariates (Mattox and Jinkerson, 2005; Meier et al., 2005). The Cox regression procedure also allows possible confounders to be added as covariates (Meier et al., 2005).

To examine the second hypothesis which compared several treatment outcomes for those who remained in treatment to those who dropped out, MANOVA was chosen because it allows analysis of the differences between dependent variables simultaneously with respect to two or more independent variables. Comparison also measured relative risks, to determine the ratio of treatment outcomes among participants who remained in treatment compared to participants who dropped-out.

3.10. Study Implementation Description

3.10.1. The Recruitment Process

The recruitment period was between July 2006 and May 2007 for RSKO and Tanjung Priok, while Sanglah commenced in late July 2006 and completed late August 2007. The overall data collection took nineteen months, from July 2006 to January 2008 and included the three and six month follow-up. In the Jakarta clinics (RSKO and Tanjung Priok), the study recruited on average six participants per month, while the Bali clinic (Sanglah) recruited on average one to two participants per month.

Recruitment experience varied among clinics. In RSKO, the number of new eligible clients decreased slightly just prior to study commencement: from an average of ten new clients a month in 2004-2005, it had gradually declined to five a month from 2006. The clinic coordinator reported that the reduction of new clients was based on two factors: a) the ability of drug users to access the program has decreased; and b) scaling-up of MMT in the other districts in Jakarta allowed potential clients to join the

nearest clinic to their address (Asril 2006, pers. comm., 25 July). Of the 87 potential participants in the RSKO clinic the study recruited 79 (90.8%). The predominant reason for refusal to join the study was time constraints.

The number of potential participants in the Tanjung Priok clinic in the first three months of data collection was about ten to fifteen a month, which was quite promising. However, the clinic limited the total numbers of daily active clients to 150 clients. The limitation was taken by the clinic because of its limited staff, limited space and limited operational hours. With this regulation, the number of potential participants dropped off to about five a month. The number of potential participants from Tanjung Priok clinic was 120 and the study recruited 83 (62.9%). Unlike the experience in RSKO, none of the eligible participants in Tanjung Priok refused to join the study. The number of recruited participants was less than the number of potential participants because of time constraints of the research staff.

During the study period, most new methadone clients in Sanglah were not eligible to be recruited into the study. This was primarily because they were ex-inmates from prison who continued their methadone regiment after release. The recruitment process in this clinic also faced a new emerging issue. During that time, there was a trend in Bali for buprenorphine clients to withdraw from buprenorphine medication and join the methadone program. It was decided to only enrol those who had stopped his or her buprenorphine medication for at least seven days before joining the methadone program. Overall, the number of potential participants in Sanglah was 25 and the study recruited 16 participants (64%).

In conclusion, the study recruited a total of 178 participants from 232 potential participants in the three participating clinics, representing 77% of all possible participants. With this number of participants, the power to test the hypotheses with significance level of 0.05 was 0.83.

3.10.2. The Data Collection Process

Some obstacles were faced in the data collection phase. First, there were difficulties relating to the interview setting, particularly in the Tanjung Priok clinic. It was difficult to meet an adequate privacy standard for the interview session. Due to limited available space in this clinic, most of the interview sessions – with the participant's consent - were conducted in an open air situation. The interview process was sometimes disrupted by other clients. In cases of disruption, the interview was temporarily stopped. The interviewers made maximum efforts to keep the interview atmosphere comfortable.

Second, the follow-up interviews for participants who dropped-out were challenging. Some had moved out of town or gone sailing, and the family objected to giving their address or contact number to the interviewers. Some of them were imprisoned in prisons or detention centres. In this situation, one of the study interviewers successfully interviewed two participants who were incarcerated in the Pondok Bambu Detention Centre. The same interviewer also succeeded in contacting a female drop-out participants who lived in a brothel. It was common for the families of the dropped-out population to refuse to allow the interviewers to do follow-up assessments. Only one participant withdrew their consent from the study. The main reason was time constraints, as he worked full time as a government officer. No participants were involuntarily withdrawn from the study.

Chapter 4

Program Characteristics

4.1. Introduction

This chapter describes the study results related to the program characteristics. There are three main sections in this chapter. The first section describes the study setting to provide readers with a clear picture of the characteristics of participating clinics. It includes their geographical location and organization. The second section describes treatment policies and treatment implementations, such as dosage, control and take-home dose policy. The third section describes clinics staff characteristics which includes staff experience in treating methadone clients and their attitude towards MMT.

In the early phase of development of the study proposal in 2005, there were only two methadone clinics in Indonesia, Rumah Sakit Ketergantungan Obat (RSKO) and Rumah Sakit Sanglah (Sanglah). As the time moved closer towards the study commencement, two more clinics which were based in Primary Health Care (PHC) were established in Jakarta and Bali, respectively. The new PHC-based clinic in Jakarta is called the Tanjung Priok Methadone Clinic (Tanjung Priok) and the new PHC-based clinic in Bali is called the Kuta Methadone Clinic (Kuta). The doctors who treated clients in Kuta were also the doctors from Sanglah. The recruitment of new clients in Kuta was very slow and many of the clients were from Sanglah. Until the end of the data collection process, Kuta only recruited 4 new participants. These data were later combined with the data from Sanglah. Therefore, this study covered three methadone clinics: RSKO, Sanglah and Tanjung Priok.

During the data collection period, stakeholders from the Ministry of Health, Republic of Indonesia (MOH-RI) particularly from the Directorate of Medical Service (Yanmed) and the Directorate of Disease Control (P2PL) in cooperation with the

Provincial Health Authorities (Dinkes) and the funding agencies scaled up methadone clinics in Jakarta, Bandung and Surabaya. In Jakarta, four additional new PHC-based clinics were established in the four other municipalities: West Jakarta, Central Jakarta, East Jakarta and South Eastern Jakarta, and two were established in prison-based clinics: one in Pondok Bambu Detention Center and one in Cipinang Prison. In Bandung and Surabaya, a methadone clinic was established in the reference provincial general hospitals, respectively: RS Hasan Sadikin in Bandung and RS Dr. Soetomo in Surabaya.

RSKO Methadone Clinic and Sanglah Methadone Clinic not only provide MMT service, but also have additional responsibilities directed by the MOH-RI. Both clinics function as technical supervisors for the PHC-based methadone clinics in their respective provinces. They also distribute methadone and document methadone dispensing at their satellite clinics.

4.2. The Setting and Organization of the Participating Clinics

Before going through the detail of the setting and organization of the participating clinics, it is necessary to overview the geographic and demographic description of the provinces of Jakarta and Bali. This is to help the reader understand how methadone clients access methadone service in these cities.

Jakarta, as a special city-province, is also the capital and the largest city in Indonesia. It is the twentieth largest city in the world based on its population (World Atlas, 2008). It occupies an area of about 661.52 km², with an official population of 8,860,381 in 2005 (Data Statistik Indonesia, 2008). The population density is about 13,344 inhabitants per square km. Jakarta and its supporting metropolitan area is called Jabodetabek (Jakarta, Bogor, Depok, Tangerang and Bekasi) and contains more than 23 million people. As one of the most populous cities in the world, Jakarta is strained by

transportation problems. Traffic congestion is very common, not only during weekdays but also on Saturday. During the peak hour, it commonly takes more than half an hour to travel for 5 kilometres by vehicle. Public transportation is poor. The ratio between private vehicles and public transportation is 92 %: 8 % (Sutiyoso, 2007). Jakarta residents prefer taking motorcycles and cars to public transportation.

Bali province is the most popular tourist destination in Indonesia. Many of the Bali residents are non-permanent residents. The area is about 5,632.86 km², and the official population in 2005 was 3,383,572 (Data Statistik Indonesia, 2008). The population density is about 601 inhabitants per square km. The capital city of Bali province is Denpasar. Unlike Jakarta, Bali is not strained by transportation problems. Traffic congestion does occur in Denpasar and its surrounding area, but the intensity and the severity is much less than Jakarta.

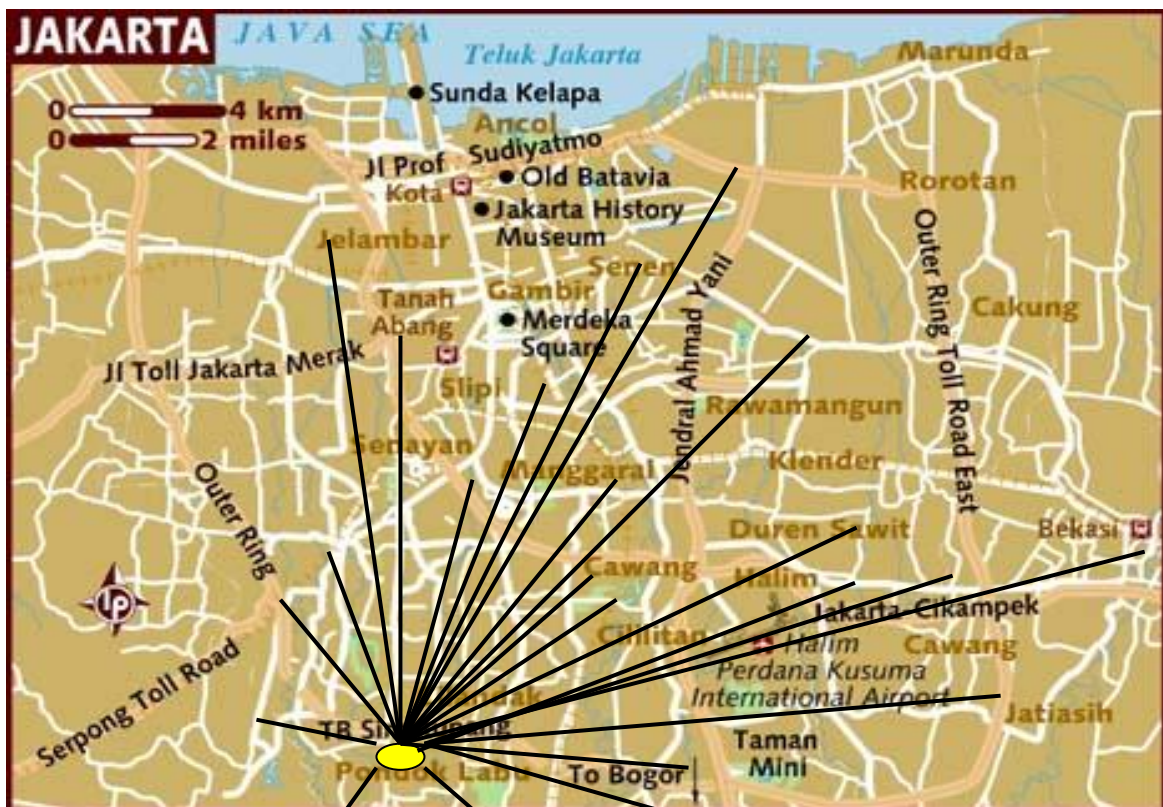
4.2.1. Rumah Sakit Ketergantungan Obat

Rumah Sakit Ketergantungan Obat (RSKO) was established in 1972 as a specialist hospital to treat substance related disorders, including drug addicted patients. From 1972 to 2002, RSKO was located in South Jakarta, in the catchment area belonged to the Fatmawati General Hospital. During this period, there was no structural relationship between RSKO and Fatmawati Hospital. As a hospital, RSKO directly reports to the Director General of Medical Care, MOH-RI. Due to an increasing demand, in mid 2003, a larger facility was developed in Cibubur, in the southern part of East Jakarta. The relocation (including the methadone clinic) was completed in July, 2007. Because many of the methadone clients in the former site objected to the relocation to Cibubur, the MOH-RI finally decided to keep the former clinic, but its management was transferred from RSKO to Fatmawati Hospital. In the first two years of the clinics establishment in Cibubur, the number of new methadone clients was very

low. The monthly average of new clients in the RSKO-Cibubur clinic was less than three per month while that of RSKO-Fatmawati was between five and seven persons per month. The clinic coordinator in an interview on 20 July 2006 stated that the location of RSKO-Fatmawati was perceived as being more adequate and accessible compared to RSKO-Cibubur. She also stated that the service infrastructure of RSKO-Fatmawati clinic was sufficient (Asril, personal comm., 20 July 2006,).

The RSKO methadone clinic located in Fatmawati was established on 27 January 2003, while RSKO methadone clinic located in Cibubur officially commenced on 13 April 2006. Up to the end of the data collection period, both clinics still belonged to RSKO. Therefore, participants' recruitment covered both sites.

Figure 4.1. RSKO clinic and participants' area of living



Since its establishment, RSKO has enrolled clients for drug treatment not only from the five municipalities of Jakarta and its metropolitan areas (Bekasi, Tangerang, Depok and Bogor), but also from other provinces such as Lampung, Central Java,

Kalimantan and Bali. A study of street injecting drug users (IDU) in Bandung, West Java found that 10.9 percent of these IDU had undergone some treatment in RSKO, Jakarta (Pisani et al, 2003). In turn, this fact shows that RSKO has served as a reference hospital for drug treatment. Nonetheless, the annual report identified that the majority of RSKO clients were from the clinic proximate area (RSKO, 2007). This study found participants were living in 32 subdistricts of Jakarta and 3 Jakarta's vicinity areas. Figure 4.1 described the distribution of participants' accommodation. RSKO participants were mostly living in different area one another.

The RSKO methadone clinic occupies a designated and an integrated room in the Outpatient Department. The total space of this clinic is about 45 square meters, which is divided into three areas: waiting area, dispensing site and counselling room. Working hours are from 9 a.m. to 3 p.m. during the weekdays and 9 a.m. to 1 p.m. on weekends and public holidays. From its establishment the number of registered clients was 600. Drop-out rate in 2004 and 2005 within three month participation in the program was between 25 and 30 percent. The number of active clients at RSKO clinic over the study period was about 200. The service charge for accessing methadone in this hospital was Rp. 15.000 (US \$ 1.7) per prescribed-dose, thus treatment cost for a month approximately was Rp. 450.000 (US \$ 48).

In terms of the organizational structure, the methadone clinic is part of the Outpatient Department. From 2003 to the middle of 2007 the Clinic Director, a psychiatrist, was appointed to oversee the clinic's daily operations. After mid-2007 and after the RSKO Cibubur's relocation was completed, there has been no specific clinic director appointed. The Head of the Outpatient Department is also responsible for managing the methadone clinic. Over the study period, there were 4 General Practitioners (GP), 5 nurses, 1 social worker, 1 psychologist, 2 administrative staff, 2 recovering addicts, 1 pharmacist and 1 pharmacists' assistant working in this clinic.

Only seven of them were full-time employees, while the rest had their main jobs in the other units/departments of RSKO. The clinic staff worked on a fortnightly-shift base.

As a specialist hospital, RSKO does not only offer methadone maintenance treatment, but also provides other drug treatment services, such as buprenorphine maintenance therapy, outpatient drug-free treatment, therapeutic-community-based residential treatment, a detoxification program, a high-care unit, short-term residential treatment and an emergency unit. Specialists including a neurologist, radiologist, internist, gynaecologist, dermatologist, clinical psychologist and professional social workers are available in this hospital.

4.2.2. Tanjung Priok Primary Health Care

Tanjung Priok Primary Health Care (PHC) is located in North Jakarta. It was established in 1970 by Jakarta Provincial Health Authority (Dinkes Jakarta) to provide basic health services for the local residents. This centre is a District PHC and has a supervisory responsibility for the sub-district PHCs. The methadone clinic was established on 25 April 2005, as the first PHC-based clinic in Jakarta. This clinic is a satellite clinic of RSKO, where RSKO provides back-up support and advice of this clinic daily operation.

Due to limited space, the designated room used for the methadone clinic in Tanjung Priok is relatively small, about 12 square meters. Although the space is considered inadequate, the centre tried to divide the room into three main areas: the waiting room, the dispensing room and the counselling room. Working hours are from 1 to 4 p.m. everyday, including on public holidays. As a newcomer, Tanjung Priok had 300 registered clients within one year of its establishment. Community demand was very high in Tanjung Priok, as a drug treatment program was not previously available in this area (Mulyanti, personal comm., 18 June 2007). This clinic served around 130 to

150 active clients every day. The proportion that dropped out with in 3 months of treatment was about 40 percent. The service charge for accessing methadone in this primary care was Rp. 5.000 (US \$ 0.65) per prescribed-dose, thus treatment cost for a month approximately was Rp. 150.000 (US \$ 21).

Figure 4.2. Tanjung Priok clinic and participants' area of living



Tanjung Priok was accessed particularly by clients living in proximate areas. This study recorded participants' living area of 11 subdistricts of North Jakarta, 2 subdistricts of Central Jakarta, 1 subdistrict of West Jakarta and 3 Jakarta's vicinity areas: Depok, Bekasi and Bogor. Figure 4.2 described the distribution of participants' living area.

A general practitioner (GP) was appointed to lead methadone clinic. In the first months of its establishment, the clinic only employed 2 GPs, a nurse and a pharmacist assistant. All of them were part-time employees and had other duties in the PHC. Serving more than 100 active methadone clients daily while the number of the clinic staff was limited meant the workload of clinic staff was very heavy. A few months later,

an additional GP, nurse and pharmacist were employed. Up to July 2007, Tanjung Priok clinic had 7 staff members and all of them were part-time.

The coordinator of the methadone clinic reports directly to the Head of the PHC. Methadone maintenance therapy is the only drug-treatment service in this PHC. Outpatient detoxification program using symptomatic medication is available but the utilization of this program is very low.

4.2.3. Rumah Sakit Sanglah

Rumah Sakit Sanglah (RS Sanglah) is located in the heart of Denpasar, the capital city of Bali province. This general hospital is a Bali province reference hospital. All specialties and comprehensive medical care are available in this hospital. Sanglah methadone clinic was set-up on 17 February 2003, as a part of the Outpatient Department of RS Sanglah. The clinic is led by a psychiatrist and directly reports to the Head of the Outpatient Department. Besides the methadone clinic, the hospital also offers a detoxification program and individual and family counselling. Over the study period, the Sanglah methadone clinic had 2 psychiatrists, 2 GPs, 6 nurses, 1 psychologist, 1 administrative staff and 1 recovering addict. Six of these clinic staff also had other responsibilities in the general hospital.

From early 2005, the Sanglah methadone clinic was located in a new building separated from the Outpatient Department. The location is in a side street within walking distance from the general hospital. This new building was designed specifically for the methadone service. It consists of a large waiting room, dispensing area, counselling rooms, group-therapy room, conference room and administrative rooms. The building occupies about 200 square meters. It also has its own parking area for motorcycles and a few cars. The clinic director stated that this new building is sufficient and appropriate to serve about 80 active methadone clients everyday. Working hours are

from 8 a.m. to 1 p.m. during the weekdays and from 8 a.m. to 12 p.m. on the weekends and public holidays. Sanglah has had 188 registered clients since the beginning of its program, with 48 of them having dropped out. Within the study period, this clinic had 125 active clients. The service charge for accessing methadone in this hospital was Rp. 8.000 (US \$ 0.82) per prescribed dose, thus approximate treatment cost for a month was Rp. 150.000 (US \$ 25). Sanglah was particularly accessed by clients living in close proximate areas. This study recorded participants' accommodation in 7 subdistricts in Bali. Figure 4.3 described the distribution of participants' accommodation.

Figure 4.3 Sanglah clinic and participants' area of living



4.3. Methadone Policies and Implementation

To assist the implementation of methadone maintenance programs in Indonesia, the Ministry of Health, Republic of Indonesia released National Guidelines of Methadone Maintenance Therapy in 2007. The development of this national guideline was based on global resources as well as practical experiences from RSKO and RS

Sanglah. One example of local context in the guideline is engaging the family in the take-home dose (THD) policy. In the implementation of methadone maintenance program, each clinic has modified their policies, adjusting them to the clinic situation and/or clients' characteristics. Below are descriptions of clinic policies and the implementation of MMT in the participating clinics.

4.3.1. Conditions of the Client Intake

For client's admittance, all clinics require minimum age of eighteen years. Clients who are less than eighteen years might join the program under special circumstances, such as having a long history of opiate dependence and history of failure with other treatment modalities. The clinics also applies stricter requirements on family involvement in the treatment for these young clients. A panel of doctors determines the inclusion of young clients into the program. Over the study period, RSKO had two young clients, Tanjung Priok had one young client and RS Sanglah had none.

For potential clients who are eighteen years and above, RSKO and Sanglah apply looser requirement for entry into the program. RSKO clinic only requires a 6-month history of opiate dependence, while Sanglah allows less than 1 year. These clinics also do not require previous attempts at other treatments, whereas due to a significantly high demand, the Tanjung Priok clinic prioritizes those who have made at least one attempt to quit heroin.

Family's consent is necessary for joining the program at the RSKO clinic, but can be exempted for those who are mature, have a steady job and show strong motivation to join the program. Because of their client characteristics (see the following section), RS Sanglah and Tanjung Priok do not require family consent but prioritized those who are brought to the clinic by outreach workers.

Admission process includes screening and assessment by the doctor. Informed consent and an information sheet about MMT rules and regulations is provided at entry. All clinics are non-discriminating, and can be accessed by any heroin user. The dissemination of methadone service information to the target population is by word of mouth. Peer influence is an important factor for the increased number of methadone clients. Table 4.1 showed who suggested the study participants to join MMT.

Table 4.1 People who suggested participants to join MMT

Clinic	Myself	Family	Friends/ Outreach workers	Health professionals
RSKO (N=79)	34 (43.0%)	9 (11.4%)	31 (39.2%)	5 (6.3%)
Tj Priok (N = 83)	18 (21.7%)	9 (10.8%)	54 (65.1%)	2 (2.4%)
Sanglah (N = 16)	9 (56.3%)	1 (6.3%)	6 (37.5%)	0

All clinics have collaborations with the local NGO's in recruiting new clients. Although prioritizing local residents, clinics are open to people of any nationality and region as long as they meet the entry requirements. Clients' participation is voluntary. Up to the end of data collection period, none of the clinics had clients sent by the court.

4.3.2. Dose Policy

In RSKO, the individual dose was determined by both the doctor and patient, whereas in Sanglah and Tanjung Priok the dose was mainly decided by the doctors. Initial doses at three participating clinics were 15 mg and 35 mg (mean = 24.9 mg). RSKO and Tanjung Priok do not limit the maximum daily dose, while Sanglah limits it to 180 mg. Average doses at baseline, 3-month follow-up and 6-month follow-up were 47.2, 76.0 and 77.2 mg, respectively. During the data collection period, the maximum dose observed in Sanglah was 180 mg while in Tanjung Priok it was 125 mg and in RSKO it was 315 mg. The highest dose in RSKO was given to a client who was also on antiretroviral medication for HIV. According to the Clinic Coordinator, this client had a drug interaction effect between methadone and antiretroviral therapy (Asril, personal

comm., 20 July 2006). The average maximum dose in the three participating clinics was 76.9 mg per day (table 4.2). Although Sanglah had the lowest average maximum dose compared to the other clinics, the dose was still categorized as high dose (> 60 mg per day). The distribution of the maximum dose was as shown below (figure 4.4). It had two peaks between lower doses and higher doses, thus treating dose as dichotomous variable was appropriate. Dosing difference among clinics was not significant ($\chi^2 = 2.384$, p-value = 0.304).

Figure 4.4. The distribution of maximum dose

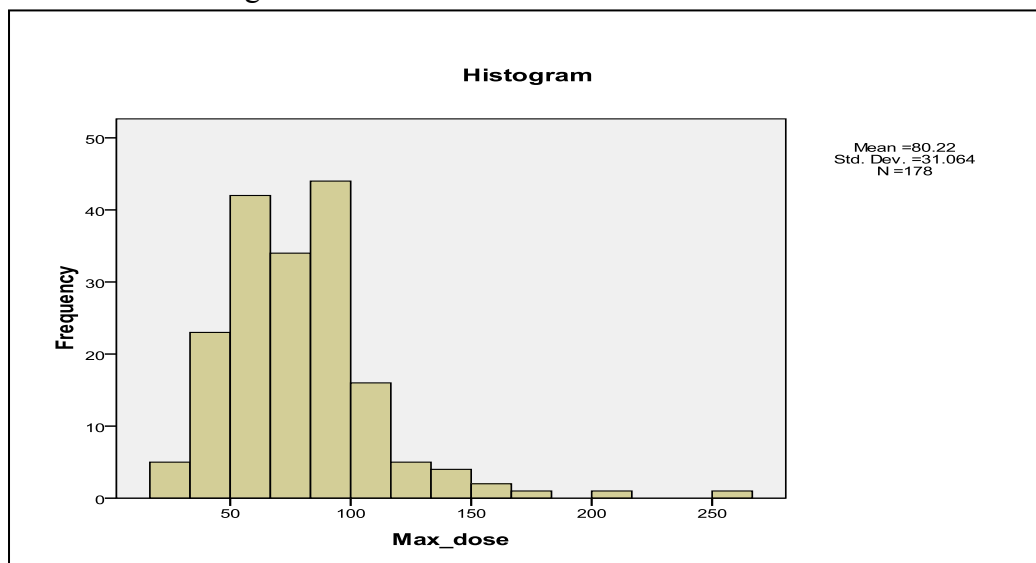


Table 4.2 Descriptive statistic of the individual maximum dose (excl. the outliers)

Clinic		Descriptive statistic
RSKO	76	Min. 25; Max. 134 Mean 76.7; SD 23.2
Tanjung Priok	82	Min. 25; Max. 150; Mean 79.7; SD 26.9
RS Sanglah	15	Min. 30; Max. 98; Mean 62.2; SD 20.0
Total	173	Min. 25; Max. 145; Mean 76.9; SD 24.9

The coordinator of the RSKO clinic reported that for some clients, determining a sufficient dose was complicated. It was common for clients to frequently request an increase in dose and they showed a tendency to be ignorant about their personal well-being. The coordinator of Sanglah applied intensive counselling and psychotherapy services to prevent clients for asking for maximum dose, unless it was absolutely

necessary. The coordinator of Tanjung Priok had no specific statement related to the maximum dose because the clinic had just started when the data collection was started and because in general their clients still relied on the doctor's decision. Nevertheless, there was a group of clients in RSKO who tried to keep their dose low and refused dose increases in spite of continued use of benzodiazepines.

Table 4.3 The proportion of missed dose

Clinic	Proportion missed dose (%)
RSKO	912 / 15062 (6.1%)
Tanjung Priok	1032 / 15514 (6.7%)
RS Sanglah	68 / 2792 (2.4%)

All clinics consider 5 consecutive missed doses to require a drop back to the initial dose. The clinics also use this period of missed doses to determine a client's drop-out status. Table 4.3 summarises missed doses for each clinic within a period of 210 observation days. The differences of missed doses among clinics were significant ($\chi^2 = 74.274$, $df = 2$, $p < 0.001$). Tanjung Priok was the clinic with the most frequent missed doses compared to RSKO ($z = -2.139$, $p = 0.032$) and Sanglah ($z = -8.630$, $p < 0.001$).

Prescribing take home doses was the most complicated issue (Asril, personal comm., 20 July 2006; Mulyanti, personal comm., 18 June 2007). It is not only related to client behaviour, but also to social and cultural needs. For example, one requirement of the National Guidelines states that the client should be in treatment for at least two months before becoming eligible for THD. However some Muslim clients who just joined the program close to the Ramadan fasting month received THD privileges before they were in treatment for two months, to allow them to fast. Compared to the other policies, the clients' most frequent complaints were about the THD policy. It was very common for methadone clients to compare their THD privileges to other clients. In order to minimize these situations, the THD decisions as much as possible were made

by a panel of clinic staff. In order to prevent diversion, all clinics required family's involvement to allow a THD, however, in practice this requirement could not always be strictly implemented. The Tanjung Priok clinic faced a difficult situation regarding family involvement in prescribing a THD. Many of their clients had no support from their families or had no family (Mulyanti, personal comm., 18 June 2007). In the case of the family's absence, all clinics encouraged outreach worker from a local NGO's to supervise the client having the THD.

Compared to Sanglah, both clinics in Jakarta faced a more problematic situation in implementing their THD policy. These clinics realized that their clients received THD more frequently than Bali. The coordinator of the RSKO clinic assumed that accessibility was the significant factor for Jakarta clients requests for more THD (Asril, personal comm., 20 July 2006). RSKO and Sanglah usually inform clients about the possibility of THD at the beginning of the program, while Tanjung Priok prefer not to inform about THD possibilities unless the client asks for it. Tanjung Priok chose this approach because their clients had less family support than those in RSKO and Sanglah.

In general the clinics allows one THD at a time. Approval of THD for more than one dose needs to be based on strong reasons, such as physical health, employment circumstances, hospitalization or imprisonment. This is to prevent the possibility of diverting the THD. The clinics usually enforce the requirement of the family's attendance for having more than one THD at a time. During the data collection period, there was no diversion of the THD reported in RSKO and Sanglah, but there were two incidents of selling the THD to friends in Tanjung Priok. Table 4.4 describes the proportion of THD by clinic. The differences of THD proportion among clinics were significant ($\chi^2 = 949.812$, $df = 2$, $p < 0.001$). The most frequent THD was released by RSKO compared to Tanjung Priok ($z = -26.824$, $p < 0.001$) and Sanglah ($z = -19.325$, $p < 0.001$).

Table 4.4 The proportion of THD

Clinic	Proportion of THD dispensing (%)
RSKO	3287 / 15062 (21.8%)
Tanjung Priok	1636 / 15514 (10.5%)
RS Sanglah	170 / 2792 (6.1%)

The following table (table 4.5) shows that RSKO and Tanjung Priok provided the first THD to some of the participants before day 40 and before two months in the program. This was due to several reasons, such as sickness, accidents, incarceration, fasting month, family business (e.g. wedding ceremony of relatives), or business that was done outside of town. Only seven out of the sixteen (43.75 percent) participants in Sanglah received a THD, while in RSKO it was 72 of 79 (91.14 percent) and in Tanjung Priok it was 67 of 81 (82.72 percent). Thus, almost all participants in the Jakarta clinics, due to various reasons, received THD privileges in their episode of treatment.

Table 4.5 First day of THD

Clinic	First day of THD			Total
	≤day 40	day 41-75	≥day 76	
RSKO	24(33.3%)	17(23.6%)	31(43.1%)	72
Tj Priok	17(25.4%)	17(25.4%)	33(49.3%)	67
Sanglah	0 (0%)	5(71.4%)	2(28.6%)	7
Total	41 (28.1%)	39 (26.7%)	66 (45.2%)	146

Table 4.6 THD Frequency

THD frequency	RSKO	Tanjung Priok	RS Sanglah	Total
Received ≤ 5 THD over the study period	20 (25.3%)	23 (27.7%)	11 (68.8%)	54 (30.3%)
1 – 2 times/week	18 (22.8%)	20 (24.1%)	3 (18.8%)	41 (23%)
3 – 5 times/week	39 (49.4%)	30 (36.1%)	2 (12.5%)	71 (39.9%)
Missing data	2 (2.5%)	10 (12%)	-	12 (6.7%)
Total	79 (100%)	83 (100%)	16 (100%)	178 (100%)

The Jakarta clinics in practice dispensed regular THD, as shown in table 4.6. RSKO approved regular THD three to five times per week for 49.4 percent of participants, while Tanjung Priok was 36.1 percent and Sanglah was only 12.5 percent.

RSKO and Tanjung Priok had nearly similar proportion of participants (about 70 percent) who received regular THD (from once a week to five times a week), whereas Sanglah only released regular THD to about 30 percent of their participants.

4.3.3. Control Policy

Control policy refers to the assessment of secondary drug use among methadone clients. There were two forms of assessing illicit drug use: self-report and objective assessments using urinalysis. All clinics reported that the implementation of urinalysis depended upon external funding availability. Clients were exempted from urinalysis fee. RSKO applied drug screening once every one to two months and in Sanglah it was done once every three months. Both random and targeted urine testing methods were applied in Sanglah and RSKO. Before sending the urine sample to the laboratory, clinic staff assessed it by visual check and temperature assessment to determine whether there had been an attempt to tamper with the sample. Due to unavailable funds, Tanjung Priok did not apply drug screening. The Tanjung Priok coordinator relied on the opinion of the supervisor from RSKO that urinalysis was not really needed in a limited resource setting, as it does not have a significant impact on treatment outcome (Mulyanti, personal comm., 8 June 2007).

Clinic policies did not provide any negative sanction for the illicit drug use during treatment. The only “sanction” was temporarily taking away a THD privilege for those who receive it, as has suggested by Ball and Ross (1991). Nevertheless, the implementation of this policy resulted in conflicts between clinic staff and the clients (Asril, personal comm., 20 July 2006). Quite often, the client denied the allegation of illicit drug use despite the urinalysis result. Due to this clinic policy some conflict between clinic staff and clients occurred at RSKO. Learning from these incidents, PHC-based clinics in Jakarta prefer to “ignore” the behavioural signs of secondary drug use)

so they would not have to suspend THD privileges (Utami, personal comm., 14 November, 2008).

4.3.4. Ancillary Services

RSKO has sufficient number of clinic staff and was nested in a specialist drug treatment hospital, thus a link to various psychosocial services was readily available. These services consisted of medical and psychiatric care; psychological intervention through individual, group (once a week) or family therapy (once a month) and home visits. Clients' responses to these services were varied. Acceptance of individual counselling was greater than that of group and family counselling. Counselling was available on clients' request, no counselling sessions were scheduled after a stable dose was achieved. Topics of counselling were mostly related to methadone treatment (particularly THD requests), physical complaints and addiction issues. Engaging families in monthly support group meetings was difficult. Most families showed lack of interest in these sessions. Vocational training such as gardening and computer lessons were provided by the clinic from 2003 to 2005. The clients' interest was greater at the beginning but gradually reduced (Asril, personal comm., 20 July 2006).

The Sanglah clinic, which is nested in a general hospital, also provided comprehensive psychosocial services. It included medical, psychiatric and psychological care, while for vocational rehabilitation, a collaborative network was established with local non-governmental organizations (NGO's). The initiative for having counselling sessions were made by clients as well as counsellors. Counsellors actively approached clients outside the counselling room, particularly if the counsellors felt that the clients had a problem. Topics of counselling were varied, from methadone treatment, addiction issues and family problems. Group psychotherapy and family support groups in this clinic have been running consistently and attracting many

participants (Hanati, personal comm., 13 August 2006). A family support group meeting was held every two weeks.

Tanjung Priok did not have sufficient clinic staff and mental health professionals to provide psychosocial services. Besides the limited space and short-term operational hours also prevented them from providing other services. After a stable dose had been achieved, counselling was prioritized for those who had physical complaints. All clinic staff had to treat general patients in the morning and treat methadone clients in the afternoon. The workload was perceived as excessive (Mulyanti, personal comm., 18 June 2007). However, this clinic collaborated with a local NGO to provide HIV counselling and testing.

Both hospital-based clinics, RSKO and Sanglah, provided comprehensive services for HIV/AIDS care, treatment and support. The services covered voluntary counselling and testing (VCT), anti-retroviral therapy (ART) or highly active anti-retroviral therapy (HAART), care and treatment of Opportunistic Infections, as well as support groups. In providing these services, the clinics worked in cooperation with other units/departments in the hospital.

4.4. Clinic Staff Characteristics

4.4.1. Staff Experience

The three participating clinics had different levels of experience in treating drug addicts and particularly in providing methadone treatment. RSKO was the most experienced clinic treating drug addicts through detoxification, rehabilitation and outpatient programs. Before commencing a methadone service in 2003, Sanglah was experienced in detoxification programs, while Tanjung Priok did not have any experience treating drug addicts before the provision of methadone service in May 2006. Therefore, the majority of Tanjung Priok staff had limited experience (less than a

year). In Sanglah, the majority of staff (7 of 11) had between one and three years experience with MMT. Only three people had more than three years experience. In RSKO, most staff (7 of 11) had more than three years experience treating drug addicts and in MMT.

Clinic staff described several reasons for liking MMT. The majority said that seeing the clients progress made them feel happy and satisfied. The next reason was because MMT gave them more opportunity to know the characteristics of heroin addicts. The third reason was the sense of togetherness among staff, which increased their team spirit. The last reason was the characteristic of MMT which can keep clients longer in program.

For further statistical analysis, the category of the clinics experience was derived from the average length of time of the individual staff in treating methadone clients. Based on a cut-off of one year, RSKO and Sanglah were categorized as experienced clinics, while Tanjung Priok was categorized as a new clinic.

4.4.2. Clinic Staff Attitude

There were five domains that reflecting clinic staff's attitudes towards MMT, namely Tough-minded about Addiction, Abstinence Orientation, Strictness about Methadone Policies, Opinion towards Clients and Incorrect Medical Knowledge related to MMT. The total scale score for each domain was calculated by adding the item responses (adjusting for the directionality) and dividing by the number of items. Table 4.7 shows the means of each domain based on the clinic and the nationality. Scores of the American counsellor attitudes were derived from the study of Kang et al. (1997)¹.

¹ Kang, S.Y, et al., 1997. Counselor Attitudes in Methadone Maintenance, *Journal of Maintenance in the Addiction*, 41-58

Compared to the American counsellor (table 4.7), the Indonesian counsellor were lesser tough-minded about addiction, less abstinence orientated, less strict about methadone policies, less negative opinion towards clients and less incorrect medical information. In brief, the Indonesian counsellor showed slight stronger client-oriented perspective than the American counsellor.

Table 4.7 Mean of Staff Attitudes by Clinic and by Nationality

Dimension	RSKO (N=11)	Tj Priok (N=6)	Sanglah (N=11)	Indonesian (N=28)	American (N=112)
Tough-minded about Addiction	2.2 (±0.3)	2.3 (±0.3)	2.1 (±0.5)	2.2 (±0.3)	2.7 (±0.3)
Abstinence Orientation	2.3 (±0.3)	2.2 (±0.3)	2.4 (±0.4)	2.3 (±0.3)	2.6 (±0.3)
Strictness about Methadone Policies	2.5 (±0.6)	2.4 (±0.3)	2.5 (±0.3)	2.4 (±0.4)	2.9 (±0.3)
Opinion towards Clients	2.2 (±0.4)	2.4 (±0.2)	2.1 (±0.4)	2.3 (±0.3)	2.5 (±0.3)
Incorrect Medical Information	2.1 (±0.3)	2.2 (±0.3)	1.9 (±0.3)	2.1 (±0.3)	2.4 (±0.3)

Statistical analysis using Kruskal Wallis test to determine differences in staff attitudes based on clinics are shown in Table 4.8. There were no significant differences in staff attitudes between clinics. Thus, categorization of the clinic staff's attitude cannot be established.

Table 4.8 Statistical analysis of the staff attitudes differences among clinics

Tough-minded about addiction	Abstinence Orientation	Strictness Policies	Opinion towards Clients	Incorrect Medical
χ^2 0.978 df 2 p 0.613	χ^2 0.674 df 2 p 0.714	χ^2 0.935 df 2 p 0.626	χ^2 2.715 df 2 p 0.257	χ^2 1.744 df 2 p 0.418

4.5. Summary and Conclusions

Various challenges have been faced in implementing methadone maintenance treatment in Indonesia. The RSKO faced a relocation problem, with the former clinic perceived as more accessible than the current clinic. Tanjung Priok clinic faced a

staffing problem compared to RSKO and Sanglah - thus they could not provide services beyond methadone dispensing and basic counselling- while Sanglah did not appear to have significant challenges in implementing a comprehensive MMT program.

In general, the programs at all clinics required people of at least 18 years old and a history of heroin dependence. Due to high demand, Tanjung Priok prioritized those who had made at least one attempt to quit heroin. As much as possible, the clinics also required family's consent and family's involvement in the treatment program. Peer influence to enter treatment was powerful, although the degree was varied among clinics. Compared to RSKO and Sanglah, most of Tanjung Priok participants joined MMT because of their peers.

Clinic regulation for dispensing methadone doses seemed to follow the National Guidelines. On the average, the maximum maintenance dose for clients followed the recommendation of higher doses (more than 60 mg). RSKO and Tanjung Priok had an average maintenance dose of around 80 mg, while Sanglah around 70 mg. However, THD practice did not follow the National Guidelines. The implementation of take-home dose (THD) policy was complicated (Asril & Mulyanti, personal comm., 18 June 2007). Judgment to allow a THD was not be based solely on the clinical assessment, but also considered social, cultural and religion factors.

Compared to American clinic staff, the attitudes of the Indonesian clinic staff were slightly more clients oriented. This study also found that the staff attitudes among clinics were not statistically different. So, clinic categorization based on staff attitudes was not possible. Overall, the variables under program characteristics that were included as potential predictor variables of treatment retention were dose, THD and the clinics experience.

Chapter 5

Client and Social Characteristics

5.1. Introduction

This chapter describes the study results related to the client characteristics. There are three main sections in this chapter. The first section of the chapter describes the participants' demographic background including their reasons to join the program, history of drug use, self-reported heroin use, and their subjective feelings about their physical health. The second section describes the participants' perception about themselves and the program, namely Treatment Motivation, Psychological Functioning, Social Functioning, Treatment Engagement (including their satisfaction with MMT) and Treatment Accessibility. The third section describes the Social Characteristics of the study participants. It covers actual observed family support and the participants' perception of their family support, peer support and community support. Actual observed family support refers to the level of family involvement in the methadone program, particularly in attending counselling session and/or accompanying participants in obtaining their take-home dose (THD).

5.2. Participants' Demographic Background

The participants' demographic background includes gender, age, marital status, employment status and educational background. The vast majority of the study participants (94.9 percent) joined the methadone program voluntarily. In terms of demographic background, most of the study participants were relatively young, with a mean age of 27.2 years ($SD \pm 4.8$). The commonest age range was 25 – 29 years (46.4 percent) followed by 20 – 24 years (27.9 percent) and 30 – 34 years (17.3 percent).

Ninety percent of participants were male and ten percent female. Most were unmarried, had graduated from senior high school and were unemployed. The

percentage of employed participants was 37.1 percent. In this group, 49.3 percent of them were full-time workers and 50.7 percent of them were part-time workers. They worked in various professions and job settings, including civil service, small business, driving, dock-work, outreach work, tattooing, motorcycle mechanics, street vending and others. The majority reported that their religion was Muslim (80.3 percent), followed by Christian (13.5 percent) and Hindu (3.9 percent). The predominant ethnic background was Javanese (32.6 percent), followed by Sundanese (16.3 percent), Bataknese (4.5 percent) and others.

Table 5.1 shows the participants' demographic background in detail. Among all of those backgrounds, there was a significant difference among clinics in participants' background to join MMT ($\chi^2 = 8.600$; $p = 0.014$). Specifically, the differences were evident between RSKO and Tanjung Priok ($z = -2.764$; $p = 0.006$) and between Tanjung Priok and Sanglah ($z = -3.238$; $p = 0.01$). Thus, RSKO and Sanglah had lower self-motivated persons in the program.

Table 5.1 Participant's Demographic Background

Dimension	Dimension	RSKO (N=79)	Tj Priok (N=83)	Sanglah (N=16)	Total (N=178)
Gender	Male (%)	82.3	95.2	100	89.9
	Female (%)	17.7	4.8	-	10.1
Background joining MMT	Voluntary (%)	91.1	100	87.4	94.9
Mean of 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 of year of education Min 6, Max 16		12.8 (± 1.9)	11.6 (± 2.2)	11.7 (± 2.2)	12 (± 2.2)

5.3.Participants’ Clinical Background

Information regarding participants’ clinical background includes their history of drug use, physical health, crime involvement, HIV status and history of drug treatment. Concerning the history of drug use, the data shows that, in this population, the teenage period is a crucial time for initial use. The following table gives a detailed explanation on the initial age of using drugs and the commonest substances being used.

Table 5.2 Age (years) of first time using substance & lifetime drug use

Substances	N	Age (years) of first time using substance			Lifetime drug use
		Min	Max	Mean (SD)	Median (SD)
Cigarettes	178	7	30	14.4 (+2.8)	12 (+ 5.5)
Alcohol	143	8	23	15.6(+2.7)	2 (+ 4.7)
Heroin	178	10	40	18.8(+4.4)	7.4 (+ 3.5)
Methadone (illegal)	8	20	35	25.4(+4.7)	0 (+ 0.1)
Analgesic	39	18	35	24.1(+4.2)	0 (+ 2.3)
Barbiturate	9	16	30	21.7(+4.9)	0 (+ 0.5)
Benzodiazepine	70	11	37	19.6(+5.3)	0 (+ 1.3)
Cocaine	19	17	40	23.6(+5.7)	0 (+ 0.3)
Amphetamine	107	14	40	20.5(+4.7)	1.3 (+1.5)
Cannabis	119	8	30	16.2(+3.3)	5.5 (+ 2.9)
Hallucinogens	11	11	29	16.9(+5)	0 (+ 0.2)
Inhalants	2	22	28	25(+4.2)	0 (+ 0.1)
Multiple (except cigarettes)	60				0 (+ 1.2)

Cigarette smoking was the commonest first substance used by the study participants. The average initial age of using cigarette was 14 years, followed by alcohol at the age of 16 years (15.6) and then cannabis at the age of 16 years. The study participants started heroin use at an average age of 19 years (18.8). The most popular substances among study participants were cigarettes and heroin, which were used by all participants. The others were alcohol (by 83.7 percent participants), cannabis (by 66.9 percent participants) and amphetamine-type stimulants (by 60.1 percent participants). Using drugs of more than one type (other than cigarettes but including alcohol) in one

period of time (poly-drug use) was common, with 33.7 percent of the study participants reporting that they had poly-drug use experience in their lifetime, with the accumulative duration ranging from 0.5 month to 108 months (mean = 4.7 months; SD \pm 14.9).

Injection was the most common route of administration for using heroin, and 95.5 percent of the participants were injecting drug users (IDU). The minimum initial age of injecting heroin was 10 years and the maximum was 41, with a mean of 20 years (SD \pm 5.1). Table 5.3 shows a summary of participants' clinical background, including their lifetime heroin use, daily heroin use at the baseline, physical health complaints at the baseline and crime status at the baseline.

Table 5.3 Participants' Clinical Background by Clinic (mean \pm SD)

Dimension	RSKO (N=79)	Tanjung Priok (N=83)	Sanglah (N=16)	Total (N=178)
Mean of lifetime heroin use (years)	7.9 (\pm 3)	6.4 (\pm 3.4)	8.7 (\pm 5.6)	7.2 (\pm 3.5)
Mean of number heroin uses per day at baseline	2.5 (\pm 1.4)	2.9 (\pm 1.4)	2.2 (\pm 1.3)	2.6 (\pm 1.4)
Mean number of physical health complaints at baseline	18.8 (\pm 9)	17.1 (\pm 8.2)	18.3 (\pm 3.7)	18 (\pm 8.3)
Mean number of criminal involvement at baseline	0.3(\pm 0.8)	1.3 (\pm 2.1)	1.3 (\pm 1.8)	0.8 (\pm 1.7)

The average duration of heroin use was 7.2 years (SD \pm 3.5), with a minimum duration of 0.4 years and a maximum of 23 years. This study recruited both new heroin users and long-term experienced heroin users. Only six participants had a lifetime heroin use of less than two years duration.

Concerning to illicit heroin use while participating in the MMT, the information was mainly derived from self-report, as the participating clinics did not routinely perform urinalysis during the data collection period. Baseline data showed that the daily

frequency of heroin use in the last 30 days prior to joining the methadone program varied between 0 and 9 times, with an average of 2.6 times per day.

Table 5.3 also shows that in terms of physical health status, the cumulative number of physical complaints at baseline ranged from 0 to 40, with a mean of 18.0 (SD \pm 8.3), while in terms of crime status, the study found that most of the participants were not involved in crime activities in the month prior to joining MMT program (mean number of criminal involvement was 0.82 (SD \pm 1.7).

In acquiring details about physical health status, seven domains were included, namely general physical status, injection related problems, cardio/respiratory status, genito-urinary status, gynaecological status (for females only), musculo-skeletal status, neurological and gastro-intestinal status.

Table 5.4 The Details of Physical complaints

Kind of physical complaints (max score)	Yes (%)	Mean number of physical complaints (SD)
General ² (13)	99.4	5.2 (\pm 2.6)
Injection-related (5)	76.5	2.6 (\pm 1.4)
Cardio-respiratory (9)	65.7	2.7 (\pm 2.1)
Genito-urinary (4)	16.3	0.7 (\pm 0.8)
Gynaecological: female N = 18 (2)	61.1	0.6 (\pm 0.5)
Musculo-skeletal (3)	49.4	1.2 (\pm 0.9)
Neurological (9)	73	2.8 (\pm 1.8)
Gastro-intestinal (5)	71.3	2.7 (\pm 1.6)

Among several general physical status (table 5.4) , having trouble sleeping was the most common physical complaint suffered by the participants (79.2 percent), followed by fatigue or loss of energy (75.3 percent), poor appetite (65.7 percent), weight loss (64.6 percent), night sweats (64.6 percent), fever (48.2 percent), teeth

² General complaints refer to the physical complaints that usually experienced by heroin addicts, such as lethargy, poor appetite, lost of weight, trouble sleeping, fever, etc

problems (42.1 percent), eye or vision problems (30.3 percent), ear or hearing problems (15.2 percent) and swollen glands (14 percent). The vast majority of the participants (76.5 percent) had health problems related to their injecting behaviour and followed by problems involving the gastro-intestinal (71.3 percent).

In terms of lifetime criminal history, 37.1 percent of the participants had incarceration experience. However, 30 days prior to joining MMT, most of the participants (about 70 percent) had no criminal involvement. There were about 30 percent who were involved in criminal activities and mostly were involved in property crime, followed by drug dealing, crime with violence and fraud (table 5.5).

Table 5.5 Involvement in Crime (baseline data)

Kind of crime (max score)	Yes (%)	Mean number of criminal involvement (SD)
Property crime (4)	20.8	0.39 (± 0.9)
Drug dealing (4)	10.7	0.22 (± 0.7)
Fraud (4)	6.7	0.10 (± 0.4)
Crimes involving violence (4)	7.3	0.11 (± 0.5)
Total crime (16)	29.8	0.82 (± 1.7)

Among all clients' clinical background (table 5.3), the differences in criminal involvement at baseline among clinics were significant ($\chi^2 = 16.538$; $p < 0.001$). In more detail, the differences were evident between RSKO and Tanjung Priok ($z = -3.882$; $p < 0.001$) and between RSKO and Sanglah ($z = -2.831$; $p = 0.005$). Thus, at the baseline, the level of RSKO participants in criminal involvement was the lowest compared to their peer in Tanjung Priok and in Sanglah.

In addition to the above clinical data, the study also collected data about HIV status among the participants. Information of this status was derived from the case notes and it showed that 108 participants (60.7 percent) had been tested before or during their methadone program, with 58.3 percent having HIV positive status. In this group, 19.8 percent had never received HIV counselling prior to HIV testing. However, among

those who had never been tested before, 26.4 percent had received HIV counselling but did not proceed to HIV testing.

The final information regarding clinical background was about the participants' history of drug treatment (table 5.6). Most of the study participants had treatment experience before joining MMT and the most common experience was an outpatient program, followed by a spiritual-based rehabilitation program, buprenorphine program, detoxification program and therapeutic-community-based rehabilitation program. About 6 percent of them had a prior methadone program experience and only 12.9 percent of them had no prior drug treatment experience. Some participants had multiple treatment episodes prior to joining MMT: 17.4 percent of detoxification; 12.6 percent of therapeutic-community; 19.1 percent of spiritual-based rehabilitation; 41 percent of outpatient drug free; 8.4 percent of buprenorphine program. About 37 percent of the participants had a prior incarceration experience and 11.2 percent of them had been incarcerated on more than one occasion.

Table 5.6 Treatment history (baseline data)

Kind of treatment	Yes (%)	Range; Median (SD)
Detoxification in medical setting	29.2	1 – 12; 0 (\pm 1.8)
Therapeutic community	25.8	1 – 10; 0 (\pm 1.2)
Spiritual-based rehabilitation	38.2	1 - 8; 0 (\pm 1.4)
Out-patient drug free	57.9	1 – 20; 1 (\pm 4.5)
Methadone	6.2	1; 0 (\pm 0.2)
Naltrexone	3.9	1 – 5; 0 (\pm 0.4)
Buprenorphine	27	1 – 7; 0 (\pm 1.1)
Incarceration	37.1	1 – 8; 0 (\pm 1.1)
Never been in treatment	12.9	

5.4.Participants' Perception of Self and Treatment

The information at baseline about how participants viewed themselves and their therapy was taken from a self-administered inventory that was adapted and modified from two instruments: the Texas Christian University - Client Evaluation on Self and

Treatment or TCU-CEST (Simpson, 1998) and the Community Assessment Scale or CAS (Brown et al., 2004). The measurement of self-perception covers several scales, namely Treatment Motivation, Psychological Functioning and Social Functioning. Measurement of treatment perception included two scales, namely, Therapeutic Engagement and Treatment Accessibility. Each scale, except for Treatment Accessibility, contains subscales. The range of scores for all subscales is from 10 to 50. A higher score reflects higher status of the subscale. A comparison of this study result on participant's perception of self and treatment was referred to the means and norms of the same instrument from TCU-CEST Score of 8,933 clients with various backgrounds, problem severity and treatment settings in the United States (Simpson, 2004; Joe et al., 2002) (appendix I).

5.4.1. Treatment Motivation

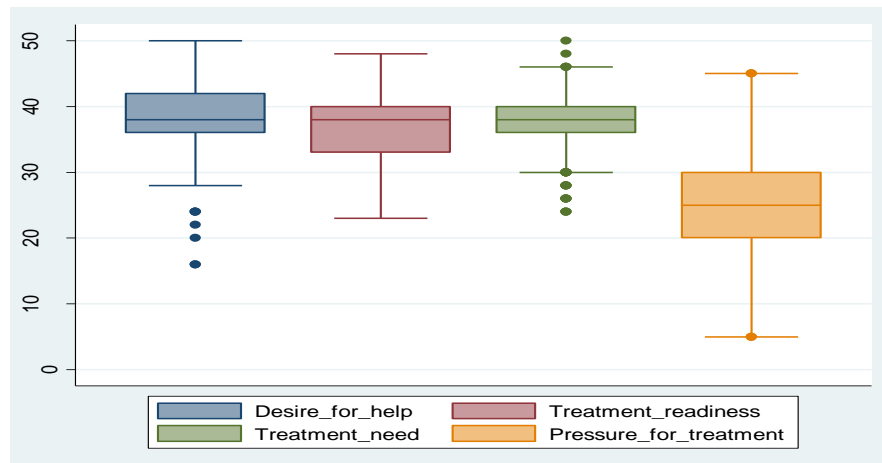
The Treatment Motivation scale consists of four subscales, namely Desire for Help, Treatment Readiness, Treatment Need and the Pressure for Help. The Desire for Help subscale consists of statements related to participants' need to seek help regarding their drug use behaviour. The average score was 38.1 (SD \pm 5.5), with a range of 16 to 50. Nearly 89 percent of the study participants agreed that they really needed help, while 40.9 percent felt their life was uncontrolled. However, approximately the same proportion (41.5 percent) disagreed. The majority of the participants (95 percent) agreed that they had been tired of their drug use behaviour and they realized that that they needed help regarding their drug use behaviour, as shown in Figure 5.1.

The Treatment Readiness subscale measures the level of participants' readiness to join treatment. The mean score was 37.0 (SD \pm 5.0), with a range of 23 to 48. Most participants (87 percent) planned to remain in treatment and 87.1 percent felt MMT was the last opportunity to overcome their drug problems. The majority of the participants

(70.2 percent) did not perceive MMT as a demanding treatment, and 73 percent had an expectation that methadone treatment would help them. The majority (82.6 percent) joined the program of their own volition. A comparison with TCU-CEST Norms (appendix 1) showed that Figure 5.1 shows that the majority of participants were relatively ready to join MMT.

The Treatment Need subscale covers statements related to the need for getting help for problems beyond drug use behaviours, such as emotional problems, physical health problems and educational/vocational problems. The mean of the subscale was 37.4 (SD \pm 4.8087), with a range of 24 to 50. Most participants (78.6 percent) stated that they needed help to overcome their emotional problems, and 88.2 percent agreed that they needed educational and vocational training, while 61.3 percent of them hoped to have medical services for their physical health. Thus, the vast majority of study participants perceived a high need for treatment (figure 5.1).

Figure 5.1 Distribution of Treatment Motivation Scale Scores



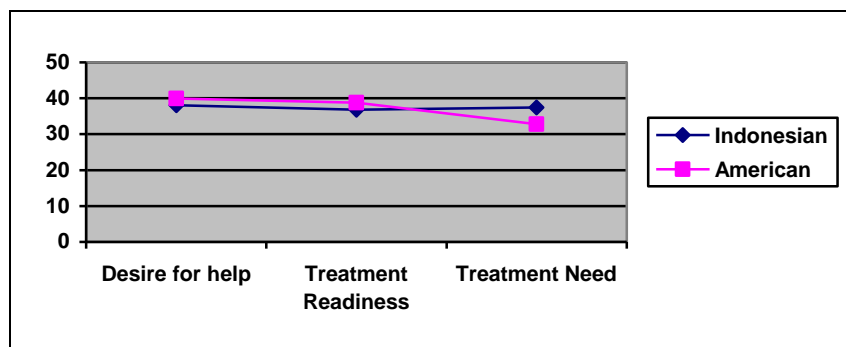
The Pressure for Treatment subscale consists of statements about external pressures to join MMT. The mean of this subscale was 25 (SD \pm 7.2), with a range of 5 to 45. Most of the participants (80.9 percent) did not experience pressure from anyone to join MMT and 66 percent did not experience any family pressure to join MMT.

Around 75 percent thought that they did not have any legal problems before joining MMT.

A review of between-clinic differences in Treatment Motivation subscales shows there was a significant difference between Tanjung Priok and Sanglah in Pressure for Treatment ($z = 2.710, p = 0.0067$). Tanjung Priok participants had a higher level of Pressure for Treatment (mean = 26.0, ± 0.8) compared to Sanglah (mean = 21.7, ± 1.3). There was no other significant difference among clinics for other Treatment Motivation subscales.

A comparison between this study data (Indonesian data) with the available US data (Simpson et al., 2005) (see Figure 5.2) showed that the average scores of the desire for help and the treatment readiness subscales of the Indonesian were slightly lower than the American. However, the average score of the treatment need subscale was about five point higher in the Indonesian data than in the American one.

Figure 5.2 Indonesian & American average scores on Treatment Motivation Scale³



5.4.2. Psychological Functioning

The Psychological Functioning scale consists of five subscales, namely, Self-esteem, Depression, Anxiety, Decision Making and Self-efficacy. Self-esteem consists of statements related to self-worth. The mean Self Esteem score was 31.5 (SD ± 5.0),

³ The data of the American refers to Means and Norms of CEST Score Profiles from TCU (Simpson, 2005)

with a range of 20 to 48. About 65 percent of study participants agreed that they had much to be proud of, 87.6 percent wished to have more respect from others and 66.9 percent were satisfied with themselves. Some felt that they were good people (48.3 percent), while 35.4 percent did not think so. More than half of the study participants (60.1 percent) felt that they were important to others.

The mean of the Depression subscale was 28.7 (SD \pm 7.5), with a range of 10 to 44 points. About half (52.9 percent) stated that they did not feel too sad or depressed and 58.4 percent stated that they did not feel hopeless about their future life, but 61.8 percent agreed that they felt tired of their life.

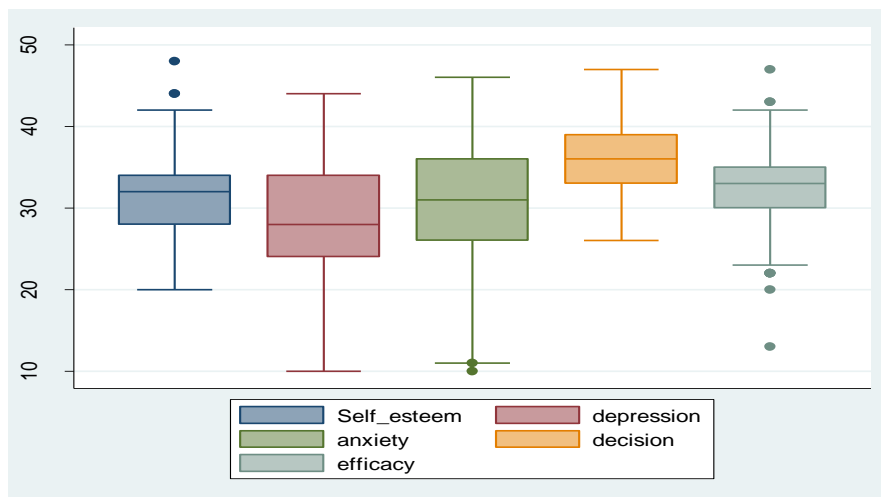
The average score of the Anxiety subscale was 30.5 points (SD \pm 6.6), with a range of 10 to 46. It was noted that 66.8 percent of participants had sleeping problems, 54.5 percent had concentration problems, and 56.8 percent felt anxious or nervous. Only 13.5 percent felt afraid of some specific situations, such as being in an elevator, in crowds or going out alone. Forty-six percent of participants had problems sitting still for a long time, while 56.8 percent experienced feelings of anxiety, 43.2 percent felt tense and 39.3 percent felt muscle tightness.

Participants' self-rated decision-making ability was reflected by statements such as planning ahead before making decisions and thinking of the consequences of each action. The average score on the Decision Making subscale was 35.8 points (SD \pm 3.8), with a range of 26 to 47. The majority (60.1 percent) realized that their actions would affect other people. Most (82.5 percent) stated that he or she tended to plan ahead, 87.1 percent always thought of the consequences of their actions and 83.1 percent had a tendency to think about the causes of their current problems. In summary, participants generally perceived that they had high ability in making decisions.

The Self-efficacy subscale involves statements related to the ability to control everything around his or her life. The mean score of the self-efficacy subscale was 32.4

points ($SD \pm 4.8$), with a range of 13 to 47. Many participants (41.8 percent) felt that they had problems controlling things happening, while 41.6 percent believed that nothing could be done to change many of the important things in their life, and 47.8 percent admitted that they often felt helpless in dealing with their own problems. The majority of the participants (75.3 percent) felt confident that there was solutions to their problems and 92.7 percent realized their future life would be totally depending on themselves.

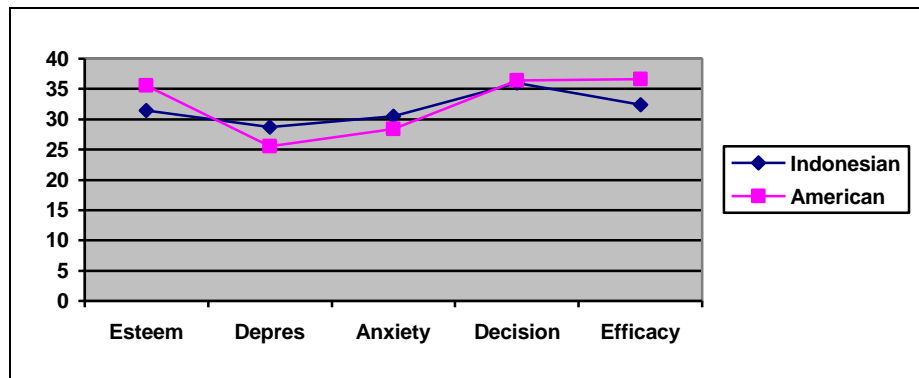
Figure 5.3 Distribution of Psychological Functioning Scale Scores



Analysis of between-clinic differences on Psychological Functioning subscales showed significant differences: firstly, the self-esteem subscale differed between that of RSKO and that of Tanjung Priok ($z = -2.540$; $p = 0.011$); and secondly, the self-efficacy subscale differed between that of Tanjung Priok and that of Sanglah ($z = -1.946$; $p = 0.05$). Participants' self-esteem in RSKO was lower (mean 30.3; SD 0.6) than in Tanjung Priok (mean = 32.3; SD 0.5), whilst participants' self-efficacy in Tanjung Priok was lower (mean = 31.6; SD 0.5) than that of Sanglah (mean = 34.3; SD 0.8).

A comparison with the US data (figure 5.4) shows that the anxiety and the decision-making status between the Indonesian and the American were relatively similar. However, the Indonesian had lower self-esteem status, higher depression status and lower self-efficacy.

Figure 5.4 Indonesian & American average scores on Psychological Functioning Scale



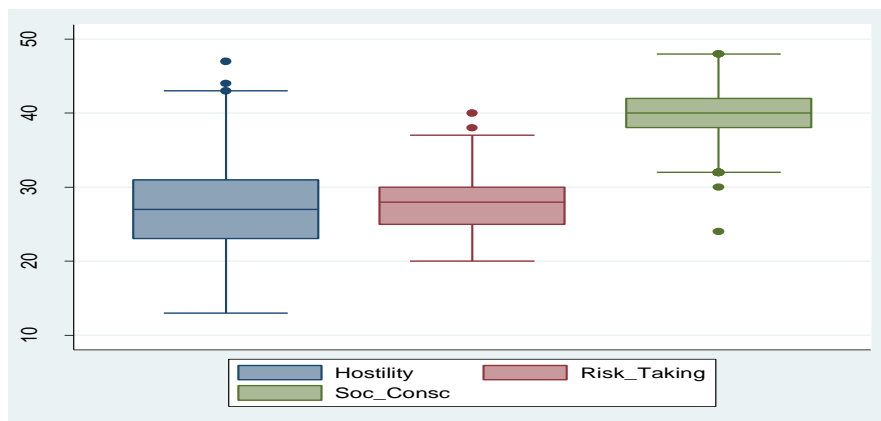
5.4.3. Social Functioning

The Social Functioning scale consists of three subscales, namely Hostility, Risk Taking and Social Consciousness. Statements under the Hostility subscale are related to feelings of anger. Statements on Risk Taking includes the courage to do something new and risky, while the Social Consciousness subscale covers beliefs on religion and compliance towards rules, laws and norms.

The average Hostility subscale score was 27.4 (SD \pm 6.2), with a range of 13 to 47 points. More study participants felt a lot of anger inside themselves (49.4 percent) compared to those who did not (34.3 percent), with 49.4 percent stating that they have a hot temper, compared with 33.1 percent who did not and 17.4 percent who were unsure. Most participants (79.8 percent) did not like to make others feel afraid of them, and 34.3 percent felt others mistreated them. Although 40.5 percent of participants thought they easily became angry with other people, the majority (78.1 percent) stated that they did not have any urges to fight with or hurt others.

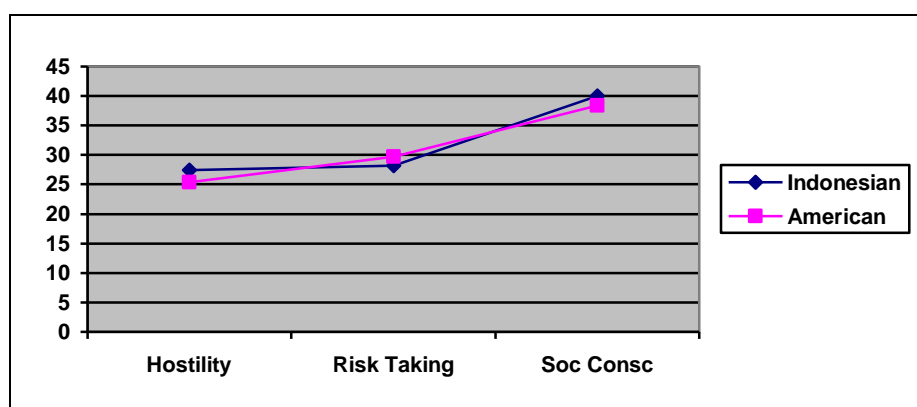
The average Risk Taking subscale score was 28.2 (SD \pm 3.8), with a range of 20 to 40. Most of the participants (72.5 percent) agreed they only did things that seemed to be safe, 80.9 percent had tendency to avoid anything dangerous and 86.6 percent considered themselves very careful and cautious people. Nevertheless, 70.8 percent liked to do an exciting thing, 68.5 percent liked to take chances and 54.5 percent liked to have a fast life.

Figure 5.5 Distribution of Social Functioning Scale Scores



The average score for Social Consciousness was 40.0 points (SD \pm 4.0), with a range of 24 to 48. More than half of the participants (57.9 percent) perceived religion as something strongly important for their life, and a further 38.8 percent perceived it as important. Thus, almost all of the participants regarded their religions as important. Most participants (80.9 percent) also felt that having relationships with other people were important, 95.5 percent of participants perceived taking care of the family as very important and 93.9 percent of participants felt that honesty was required in every situation. Analysis of between-clinic differences on Social Functioning subscales showed there were no significant differences among clinics.

Figure 5.6 Indonesian & American average scores on Social Functioning Scale



A comparison between this study data and the US data shows that the figure of social functioning scale among participants was relatively similar (figure 5.6). The Americans were slightly lower in their hostility and social consciousness status but were slightly higher in their risk taking status.

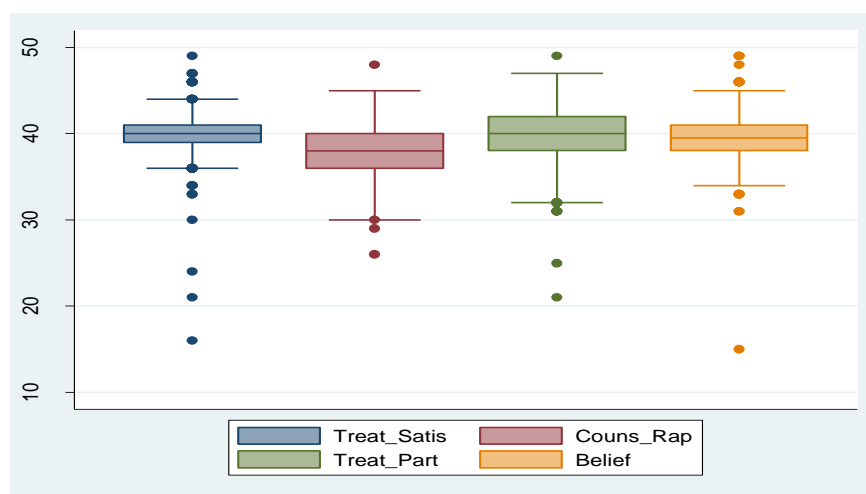
5.4.4. Treatment Engagement

The Treatment Engagement scale consists of four subscales, namely, Treatment Satisfaction, Counselling Rapport, Treatment Participation and Client's Belief towards Program. The average score on the Treatment Satisfaction subscale was 39.8 points, with a range of 16 to 49. The majority of participants (85.9 percent) perceived that time schedules for counselling sessions at the program were convenient, 67.2 percent agreed the program had provided skills and knowledge they needed, 91 percent perceived that the program had been organized and run well, and 87.5 percent stated that they were satisfied with the program. In addition, 83.1 percent stated that they could get personal counselling, 99.2 percent agreed that clinic rules and policies had been thoroughly explained and 84.9 percent thought that the program location was relatively convenient.

The average score for Counselling Rapport was 38.0 points, with a range from 26 to 48. Most of the study participants (87 percent) perceived their counsellor as a trustworthy person, 82.5 percent as a person whom they could easily talk to, 88.7 percent

as a motivating and encouraging person, 58.1 percent as a person who had sensitivity to the participant's situation and problems and 83.1 percent as a person who respected the participants. Having high confidence in their counsellor, almost all of the participants (86.5 percent) stated that they followed the guidance from their counsellors. Figure 5.7 shows that most of the participants perceived that they had good counselling rapport with their counsellor.

Figure 5.7 Distribution of Therapeutic Engagement Scale Scores

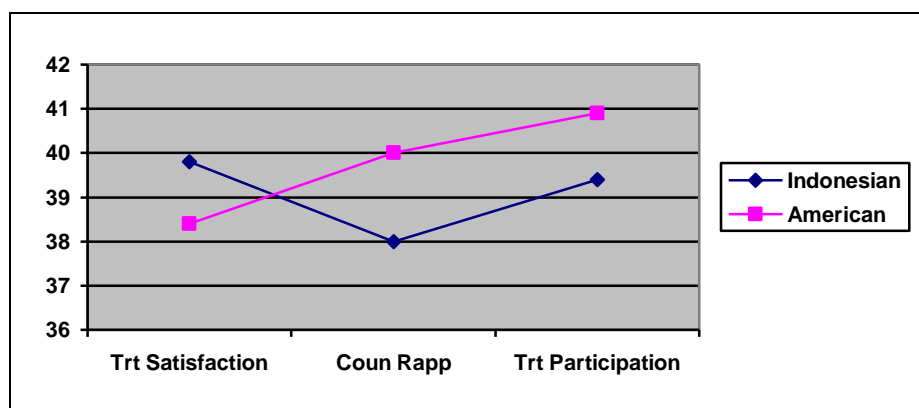


In terms of Program Participation, the average score was 39.5 points, with a range from 21 to 49. The vast majority of the participants (89.3 percent) had no objection to talking about their feelings during counselling, 91.6 percent felt that they had made progress in overcoming their drug problems, and 89.8 percent thought that they had made progress in their methadone program. Further, 71.2 percent claimed that they always attended counselling sessions, 89.3 percent had stopped or greatly reduced their drug use while in MMT, 72.3 percent said that they always actively participated in their counselling sessions, 87.7 percent had a better understanding of their own feelings and behaviour, 88.7 percent had established better relationships with others, 80.3 percent had made progress in managing their emotional or psychological issues and 92.7 percent had given honest feedback during counselling.

The average score of Clients' Belief towards the program was 39.5, with a range from 15 to 49. Almost all participants (94.9 percent) believed that the MMT was helpful to overcome their problems, 92.7 percent believed that the MMT met their treatment needs, and 95.4 percent believed that the MMT should be used more with heroin addicts. Most of them (76.4 percent) also believed that being a methadone client was not a loser and 96 percent agreed that the ultimate goal for MMT was abstinence from all drugs. Overall, most participants showed a high level of belief in MMT (figure 5.7). The review of between-clinic differences on Treatment Engagement subscales showed there were no significant differences among clinics.

A comparison with the US data (figure 5.8) shows that the Indonesian had a higher level of satisfaction but lower level of counselling rapport and treatment participation.

Figure 5.8 Indonesian & American average score on Treatment Engagement



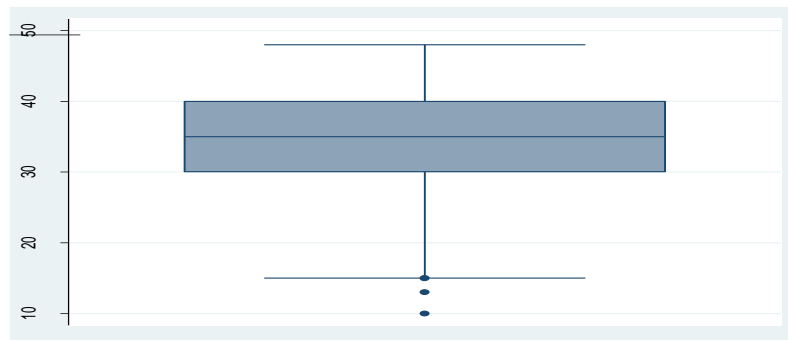
5.4.5. Treatment Accessibility

There are two measurements within the Treatment Accessibility scale. The first one measured the participants' actual expenses, including their expenses to access MMT. The second one measured the participants' perception of their capability to access MMT. Among all study participants, only nineteen objected to reporting their monthly expenses. The participants' cost of living (including money to pay for

methadone treatment) ranged from Rp. 300.000,- to Rp. 7.000.000,- (AU\$ 42.9 to 1000) per month. The mean of monthly expenses was Rp. 1.439.434,- (AU\$ 205.6) (SD \pm Rp. 1.199.119). Half of the participants (56.2 percent) spent around Rp. 15.000 to Rp. 30.000,- (AU\$ 2–4) to access methadone treatment everyday; 24.2 percent spent Rp. 31.000 to Rp. 50.000,- (AU\$ 4.1–7); and 11.8 percent spent more than Rp. 50.000,- (> AU\$ 7). Only 7.3 percent spent less than Rp. 15.000 (< AU\$ 2) a day. About a half of the participants (51.6 percent) received financial support to access methadone treatment from their family. Others supported themselves (29.6 percent) or were supported by their spouses (10.3 percent). There is no Government subsidy to assist clients to access methadone treatment. Travelling time to access methadone treatment was most commonly from 15 to 30 minutes (40.1 percent), followed by 31 to 60 minutes (26 percent), then less than 15 minutes (24.3 percent), and more than 60 minutes (9.6 percent). Motorcycle transport was most common (55.1 percent), while 23.6 percent used public transportation (buses, *angkot*) and 8.4 percent drove a car.

Participants' perception of accessibility ranged from 10 to 48, with an average score of 34.58. Around 69.1 percent did not perceive visiting the clinic every day as a big problem, but 48.9 percent admitted having financial issues for accessing the program. There did not appear to be major difficulties in travelling to the clinic, with 75.3 percent reporting that travel time to access the clinic was not an obstacle and 74.2 percent that they did not have any problem with the transportation means. Figure 5.9 shows the distribution of participants' perception of treatment accessibility. Review of clinic differences on Perceived Treatment Accessibility scale showed there was no significant difference among clinics.

Figure 5.9 Distribution of Perceived Treatment Accessibility Scores



5.4.6. Perception of Methadone Treatment

The subjective feelings of the study participants about the impact of methadone treatment on their physical and psychological condition were measured by using Visual Analog Scales (VAS) with a range from 0 to 100 mm. This measurement is similar to Likert Scale. It includes seven subscales that measure the methadone dose sufficiency, the side effects and the methadone capacity to prevent heroin craving. In general, the participants had positive views about methadone and felt that life was normal on methadone. They also perceived that their dose had managed their symptoms, had few side effects and helped them in preventing heroin craving. Table 5.7 shows the descriptive statistics of the subjective feelings about methadone sufficiency at baseline.

Table 5.7 Subjective Feelings of Methadone Sufficiency

Code	Scales	Min - Max ⁴ (mm)	Mean	SD
A1	Strength of methadone in holding the clients	0 - 100	64.6	17.5
A2	Buzz effect of methadone	0 - 100	58.5	19.4
A3	Side effect of methadone	0 - 99	34.2	24.3
A4	Intensity of side effect bothering clients	0 - 98	29.8	23.5
A5	Intensity of clients liking methadone	0 - 100	65.2	17.9
A6	Belief that methadone makes client feel normal	0 - 100	71.4	20.6
A7	Intensity of heroin craving during joining MMT	0 - 100	35.2	26.0

⁴ The Visual Analog Scale (VAS) is a Likert-scale-like but performed in a visual way

The baseline qualitative data about participants' subjective feelings of the best things about methadone treatment yielded three main results. Firstly, the majority of the participants (55.9 percent) stated that methadone treatment was effective to overcome heroin withdrawal and craving symptoms. Secondly, 24.3 percent stated this treatment helped them stop using heroin and prevented risky behaviour related to heroin injection. Thirdly, 16.3 percent of participants had a better life while staying in the program, for example they became more focused on life, more concentrated on their work / study and had a more balanced life style.

The participants were also asked about their subjective feelings of the worst things about methadone treatment at baseline. About one third (35.5 percent) of the participants stated that methadone treatment had no negative effect. Others did have any negative feelings, including 15.7 percent who felt that they depended on methadone, 15.7 percent who had negative side effects such as toothache, sore mouth, pruritus, insomnia and muscle tension, 14 percent who had constipation problems, 13.5 percent reporting lack of energy, and 4.7 percent who felt that it was very complex to access methadone treatment (particularly because of the requirement to visit the clinic everyday).

5.5. Social Characteristics

In terms of social characteristics of the study participants, the demographic data showed that most of them (63.5 percent) still lived with their parents, 10.6 percent lived with their spouse (with or without children) and only five percent lived alone. About 15 percent of participants lived with other injecting drug users (IDU) in the same house, mostly with their siblings and/or spouses.

The data about social characteristics were derived from two sources: clients' case notes and a self-administered instrument (a similar instrument that was used for the

Participants' Perception on Self and Treatment, page 103). Data from the clients' case notes referred to the frequency of family's attendance at the methadone clinic (called actual support), while data from the self-administered instrument consisted of three subscales, namely family support (subjective feelings), community support and peer support.

5.5.1. Family Support

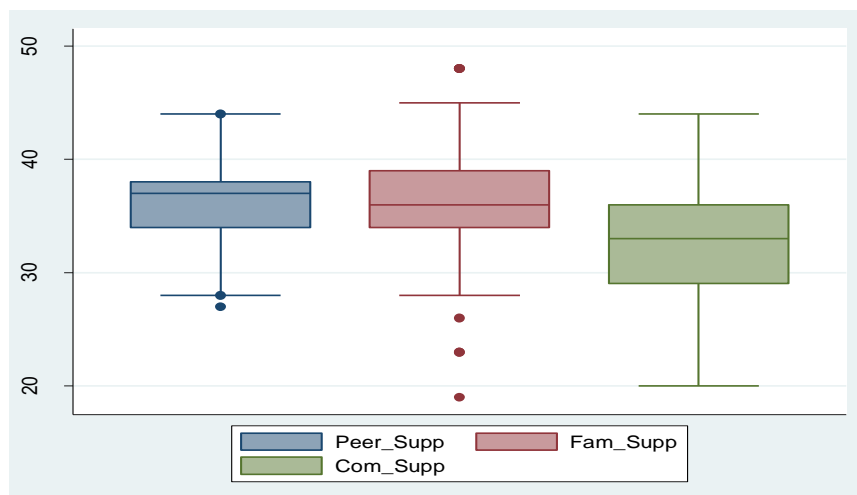
The attendance of family, called the actual family support, at methadone clinics was particularly crucial for THD privileges, as it was required by clinic policy. However, only 36 percent of the participants received this kind of support. Participants were divided into two groups, based on the frequency of actual family attendance. Some participants were accompanied by a family member 10 times or more over the study period or came regularly with their families with an average of once every two visits to obtain the THD. Others were accompanied less than 10 times over the study period, with family attendance only in special circumstances such as when the participants were sick, hospitalized, had an accident or were incarcerated. In this case, mothers were the biggest supporters for most participants in this group (36.1 percent), followed by fathers and spouses (particularly wife) (both 22.2 percent) then brothers, sisters and other relatives (19.4 percent).

Analysis of between-clinic differences in actual family support showed that the highest frequency of family attendance was in RSKO (frequency of clients with regular actual support was 41.5 percent) and followed by that in Tanjung Priok (frequency of clients with regular actual support was 15 percent). None of the Sanglah participants received regular actual support. Qualitatively, the participants at RSKO had stronger actual family support than their peers at the two other clinics. Non-parametric test of between-clinic difference in actual family support was significant ($\chi^2 = 20.090$, p

<.001), supporting the qualitative observation. The differences were evident between RSKO and Tanjung Priok ($z = -3.933, p < 0.001$) and between RSKO and Sanglah ($z = -2.948, p = 0.003$).

Concerning perceived family support, the mean was 36.2 points ($SD \pm 5.0$) with a range from 19 to 48. Most participants (71.9 percent) said that their family had received good information on how methadone works, 70.7 percent could talk about anything with their family, 73.1 percent could rely on their family if they needed help, 88.7 percent perceived their family as supportive towards their methadone treatment, 79.9 percent agreed their family knew well how drugs affect someone, and 72.9 percent said they had a solid relationship with their family. On the other hand, 44.4 percent perceived their family did not know much about their life while 42.5 percent thought that their family knew a lot about their life. Nearly 40 percent believed that their family trusted them while 37.7 percent perceived that their family did not trust them. In general, the study participants perceived their family as relatively supportive towards their life and treatment program, as shown in figure 4.8. Analysis of between-clinic differences in the perception of family support showed there were no significant differences among clinics.

Figure 5.10 Distribution of Perceived Social Support Scale Scores



Interestingly, there was no significant correlation between perceived family support and actual support through family member attendances during treatments ($\rho = 0.0518$, $p = 0.5058$). Thus, the participants' perception of their family support did not reflect the family actual support. Participants whose family did not attend the clinic did not automatically perceive their family as not supportive nor did those whose family did accompany them feel their family was more supportive than others were.

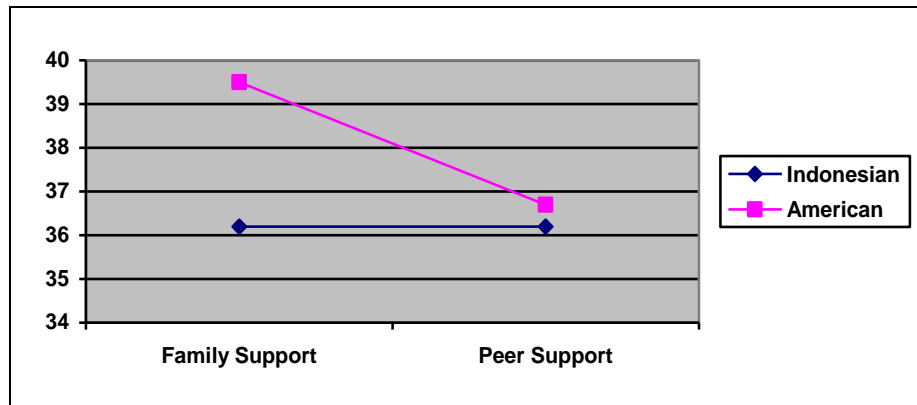
5.5.2. Perception of Other Social Supports

The mean score for participants' perception of peer support was 36.2 (SD \pm 3.6), with a range from 27 to 44. The majority (74.7 percent) of the participants said they had at least one friend on whom they can rely to help them if they require it, 62.3 percent had long-term friends, 84.8 percent perceived their friends as supportive towards their efforts in changing their life, 90.4 percent had a good friend who did not use any drugs, 61.8 percent said their friends in the methadone program cared about them and their problems and 82 percent perceived there was a sense of a family atmosphere at the methadone clinic. Conversely, 46.6 percent stated that their friends did not really understand their situation and 33.7 percent said they could not rely on their friends. As with family support, most participants perceived their peers (inside and outside the methadone program) as supportive towards their life and their treatment program (figure 5.10). Review of clinic differences on the perception of peer support showed no significant difference among clinics.

A comparison with the US data in family support and peer support (figure 5.11) showed that the perception of Indonesian of their family support was lower than the American, while for the perception of peer support between both data was relatively similar. The fact that Indonesian clients perceived their family support was lower than American was quite interesting. The clients did not necessarily perceive strong family

involvement in the treatment program as evident in drug treatment program in Indonesia (Rachma, 1997) as a positive thing.

Figure 5.11 Indonesian & American average scores on Social Support



The mean score for participants' perception of community support was 32.6 (SD ± 5.2), with a range from 20 to 44 points. About 70 percent of the participants stated that positive activity programs were available in the neighborhood, 52.8 percent perceived that people in the neighborhood cared about one another, 64.6 percent agreed that they should be alert living in the neighborhood, 87.1 percent agreed that religion played a strong role in the neighborhood, and 54.5 percent stated that the neighborhood was a safe environment. About 45 percent of the participants perceived that drugs were easily available in their neighborhood and 37.7 percent agreed that it is hard for them not to get into any trouble in their neighborhood.

Analysis of between-clinic differences in the perception of community support showed a significant difference between RSKO and Tanjung Priok ($z = -3.465$, $p = 0.0005$) and between RSKO and Sanglah ($z = -3.112$, $p = 0.0019$). The participants' perception of community support was the lowest in RSKO (mean = 30.9, ± 4.8), while Tanjung Priok was higher (mean = 33.8, ± 5.3) and Sanglah was the highest (mean = 34.9, ± 3.9).

5.6. Summary and Conclusions

In general, the study participants were relatively motivated to join MMT. Most joined MMT voluntarily, without perceiving any external pressure. The composition of them was predominantly male, age of 27 years, unmarried, graduated from senior high school and unemployed. The differences of participant backgrounds among clinics were not significant.

The majorities of the participants was IDU, had a long history of heroin use, multiple treatment episodes before joining MMT and were new in the methadone treatment program. Before joining MMT, many of them had physical complaints, mostly related to the area of injection, followed by cardio-respiratory, neurological and gastro-intestinal. Their physical health status did not hinder their visiting the clinic everyday.

About 70 percent of the participants did not have any criminal involvement 30 days prior to joining MMT. Their psychological status at baseline compared to the American clients was considerably lower. The Indonesian had lower self-esteem, higher depression status and lower self-efficacy. In terms of treatment engagement, the study participants showed higher satisfaction with the program compared to the American, but showed lower counselling rapport and treatment participation. Methadone was perceived by the majority as sufficient to overcome their withdrawal symptoms, to prevent risky injecting behaviour and to normalize their daily life. More than half of participants did not perceive accessing MMT as an obstacle or problem either from a financial or from a distance perspective.

About one third of the participants received actual support from their families through family members' attendance at the clinic, particularly in accompanying them for obtaining their home dose and/or attending counselling. For most participants, their

peers and family in general were perceived as more supportive than the general community was.

All variables under the client characteristics were examined for its potential to influence treatment retention (chapter 6).

Chapter 6

Treatment Retention and Its Predictive Variables

6.1. Introduction

This chapter describes the major study results that are related to the treatment retention rates and its predictive variables. There are five main sections in this chapter. The first section describes the retention rates of MMT clients in the participating clinics. The following three sections describe how variables of program, client and social characteristics affecting treatment retention. The fifth section describes how potential variables of all characteristics affecting treatment retention. The final model of the treatment retention predictors concludes the section.

The analysis of predictive variables of treatment retention included two steps. The first step was to undertake a univariate analysis to examine each variable for its potential to influence treatment retention. All categorical variables were analysed using a log-rank test of equality across strata, while continuous variables were explored using a univariate Cox proportional hazard regression test. In this first step of variable screening, an *a priori* decision was made that variables with a $p = 0.25$ or less would be included in further multivariate analysis. The second step of the statistical analysis was to undertake a multivariate analysis using Cox regression survival analysis in both a non-interactive model and an interactive model to examine the degree to which potential variables affected treatment retention and a p -value of ≤ 0.05 was set for significance in the final stage for the model.

6.2. Treatment retention

This study recruited 178 participants from three participating clinics, of whom 52 of them had at least one dropout experience from the MMT program over the study period. Among the dropout participants, 26 of them re-entered the program more than

once (number of re-entries shown in Table 6.1). The multiple entries were only evident at Jakarta clinics. In RSKO, sixteen of the dropouts had multiple entries, with fifteen of them joined two times and one recommenced for four times. In Tanjung Priok, four of them recommenced for two times, five of them for three times and one of them for four times (Table 6.1).

Table 6.1 Recurrent Entries: number of clients entering program more than once by clinic

Number of entries	RSKO (N=79)	Tanjung Priok (N=83)	RS Sanglah (N=16)
2	15	4	-
3	-	5	-
4	1	1	-

The retention rates for all clinics and the overall rates at 3-month follow-up and 6 months of follow-up are shown in Table 6.2. There were no significant differences in retention rates between clinics (Kruskall Wallis test $\chi^2 = 2.462$, 2 d.f, $p = 0.2920$).

Table 6.2 Retention rates at 3 months and 6 months of 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%)
All	74.2% (+3.0%)	61.3% (+3.4%)

The reasons for dropping out were various. The most commonly quoted reasons were being caught by the police due to criminal involvement (particularly property stealing), lack of time to access the clinic and becoming bored with the program. Other reasons were moving to other cities, distance circumstances to access the clinic, changing to other substitution treatment, changing to residential drug free programs, and having conflict with a peer in the methadone program.

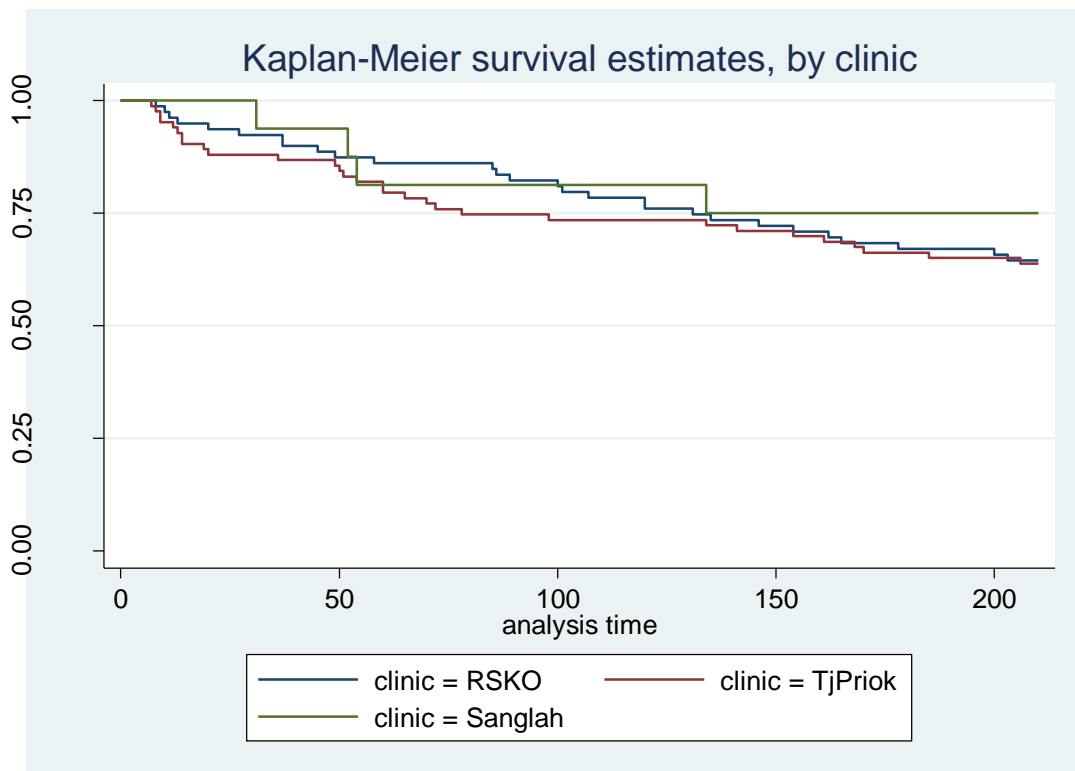
6.3. The Impact on Treatment Retention of Program Characteristics

Program characteristics which are potential to be predictors of treatment retention consisted of Clinic Setting, Experience of the Clinic, Clinic Orientation, the policies on Dosage and Take-home Doses.

6.3.1. Univariate Analysis

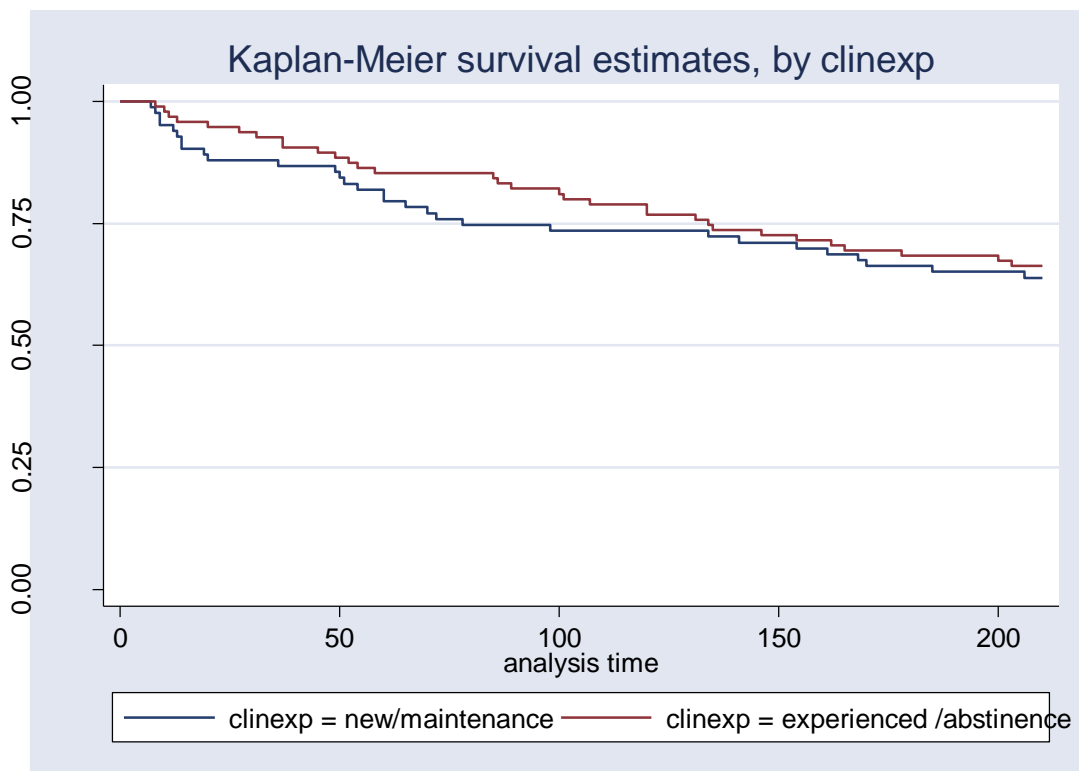
The log-rank test of equality across strata for clinic setting had a p-value of 0.7022, thus this factor was not included in the final model. The graph (figure 6.1) shows that the survival functions of each clinic setting were almost parallel for the observation time, with the exceptional of Sanglah after the 150th observation day, which reached plateau. However, the limited number of the study participants in Sanglah hindered a clear interpretation of this finding.

Figure 6.1 Kaplan-Meier survival estimates, by Clinics



Based on the length of experience in treating methadone program, RSKO and Sanglah were classified as experienced clinics, whereas Tanjung Priok was classified as a non-experienced clinic (see page 94). The log-rank test of equality across strata for the predictor of clinic experience had a p-value of 0.6359. The graph (figure 6.2) also shows that treatment retention did not differ with respect to clinic experience. Nevertheless, empirical observation showed that the length of clinic in providing methadone program might contribute to the better outcomes. Thus, although it was not found to be significant in the univariate analysis, it was still included for further modelling.

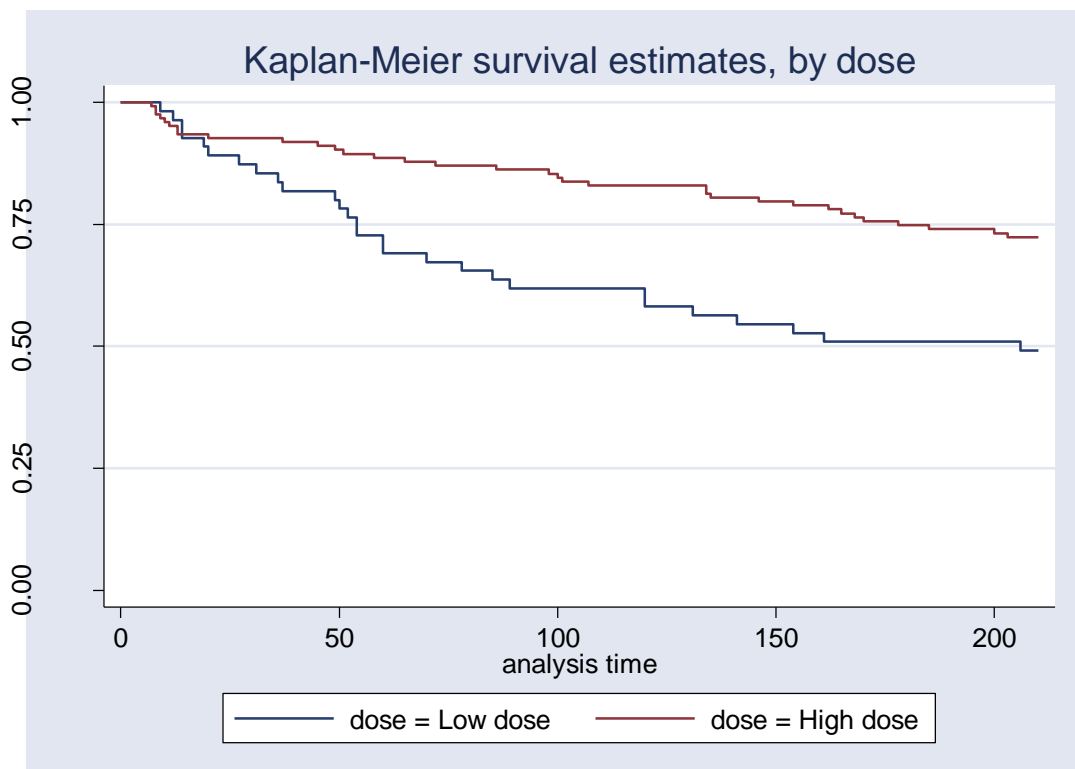
Figure 6.2 Kaplan-Meier survival estimates, by Clinics Experience



The initial dose of the study participants ranged from 15 mg to 35 mg, with the average initial dose being 25 mg (SD \pm 3.7). The dose at baseline interview ranged from 20 mg to 90 mg, with the average dose being 47.2 mg (SD \pm 14.2). To test dosage as a potential predictor of treatment retention, the effect of the maximum dose received by

the participants over the study period was analysed. The maximum dose for clients ranged from 25 mg to 145 mg (SD \pm 24.9). Two different data analysis approaches were utilised in analysing the maximum dose. One treated the data as a continuous variable and the other treated it as a categorical variable (high dose was $>$ 60 mg and low dose was \leq 60 mg). An analysis on the maximum dose as a continuous variable yielded a p-value of 0.042, while an analysis of that as a categorical data yielded a p-value of 0.0011. Both approaches indicated that the maximum dose had significant potential as a predictor for treatment retention. The final analysis will use a categorical instead of a continuous variable. The reason using a categorical variable was its comparability with previous research reports that also treated dose in a categorical way (Saxon et al., 1996; Booth et al., 2004; Joe et al, 1991; Caplehorn and Bell, 1991) and as the distribution had two peaks between lower and higher dose (see page 87).

Figure 6.3 Kaplan-Meier survival estimates, by Dose



Data related to take-home doses (THD) were retrieved from the clients' case notes. However, not all case notes provided all data needed for this study. Some of the case notes of the dropouts were lost or incomplete, particularly at Tanjung Priok clinic. THD distribution was not normally distributed, with a tendency to skew to the right. Thus, treating THD as a continuous variable was the most appropriate for statistical analysis. Univariate analysis on THD yielded a p-value of < 0.001 , meaning that this variable was eligible for further modelling.

According to the National Guidelines, THD can only be given after a client remains in treatment for at least two months. To check whether the THD data representing both populations: the participants who remained in the program and the participants who dropped out of the program, THD during 30 days prior to the 3-month follow-up interview was incorporated, with an assumption that this period can still cover the dropouts. The result of this check, from a statistical perspective, would establish the representativeness of the remaining data. Univariate analysis showed a p-value of 0.0037, which indicated that THD in the period of 30 days prior to 3-months follow-up interview was also eligible for further analysis.

To determine whether THD data of the entire observation and THD data of 30 days prior to the 3-month follow-up interview were correlated, a Spearman test was performed as the data were continuous and not normally distributed. This test confirmed a significant relationship (Rho 0.6730; $p < 0.001$) between those two data. Therefore, only THD of the entire observation period was incorporated in the further model, as this set of data described THD privileges more comprehensively.

6.3.2. Multivariate Analysis

Two models were built to analyse potential variables influencing treatment retention. One was a model without interactional variables and the other was a model

included all possible interactional variables. In this multivariate analysis, variables with p-value of 0.05 or less determined the significance of the model.

The non-interactional model included Dose (as a categorical variable), Take-home Dose for the entire observation period (as a continuous variable) and Experience of the Clinic (see figure 6.4). The THD variable had a p-value <0.01 (SE=0.008) and the Dose variable had p-value <0.05 (SE=0.298), thus, were significant in predicting treatment retention. The variable of Experience of the Clinic in this model had a p-value of 0.756, thus this variable was not a significant predictor for treatment retention. However, based on empirical assumption, this variable was still included for further analysis of overall characteristics.

Figure 6.4 A Non-Interactional Model of Program Characteristics

No. of subjects = 173; No. of observation = 180; No. of failures = 58 Time at risk = 29075; LR $\chi^2 = 41.20$ Log likelihood = - 267.52194; Prob > $\chi^2 = 0.0001$					
Variables	Coefficients	SE	z	P > z	95% CI
Take-home dose	-.0351261	.0076754	-4.58	0.000	-.0501697 -.0200826
Dose	-.5576627	.2697825	-2.07	0.039	-1.086427 -.0288988
Clinic experience	.0824439	.2648006	0.31	0.756	-.4365557 .6014434

The interactional model included dose, THD and the interaction between dose and THD. The analysis result showed that the interaction variable was not significant (figure 6.5).

Figure 6.5 An Interactional Model of Program Characteristics

No. of subjects = 173; No. of observation = 180; No. of failures = 58 Time at risk = 29075; LR $\chi^2 = 44.93$ Log likelihood = - 265.66018; Prob > $\chi^2 = 0.0001$					
Variables	Coefficients	SE	z	P > z	95% CI
Dose	-.9121895	.3272666	-2.79	0.005	-1.55362 -.2707587
Take-home dose	-.0729568	.028185	-2.59	0.010	-.1281983 -.0177153
Interaction between Dose & Take-home dose	.0456677	.0293425	1.56	0.120	-.0118425 .103178

Therefore, the final model of program factors in affecting treatment retention was a non-interactive model. Both maximum dose and THD influenced treatment retention independently (figure 6.6). Increased maximum dose and more liberal use of THD significantly improved treatment retention.

Figure 6.6 Final Model of Program Characteristics

No. of subjects = 173; No. of observation = 180; No. of failures = 58 Time at risk = 29075; LR $\chi^2 = 41.10$ Log likelihood = - 267.57053; Prob > $\chi^2 = 0.0001$						
Variables	Coefficients	SE	z	P > z	95% CI	
Dose	-.558205	.2698768	-2.07	0.039	-1.087154	-.0292562
Take-home dose in continuous variable	-.0352881	.0077139	-4.57	0.000	-.050407	-.0201691

The interpretation of hazard ratios in the final model (figure 6.7) was that if the maximum dose was altered from low to high, the rate of dropout decreased by 42.8 percent. If THD was given more frequently, the dropout rate decreased by 3.4 percent.

Figure 6.7 Hazard ratio of the final model

No. of subjects = 173; No. of observation = 180; No. of failures = 58 Time at risk = 29075; LR $\chi^2 = 41.10$ Log likelihood = - 267.57053; Prob > $\chi^2 = 0.0001$						
Variables	Coefficients	SE	z	P > z	95% CI	
Dose	.5722353	.154433	-2.07	0.039	.3371748	.9711676
Take-home dose in continuous variable	.9653273	.0074464	-4.57	0.000	.9508423	.9800329

One of main assumptions in implementing the Cox proportional hazard approach is the proportionality of the model (Kleinbaum and Klein, 2005). A test of Proportional Hazard Assumption using Schoenfeld test (Fig.6.8) yielded non-significant results for both variables: dose and THD. It means that this model did not violate the proportionality assumption. Thus, an analysis using Cox Proportional Hazard was appropriate.

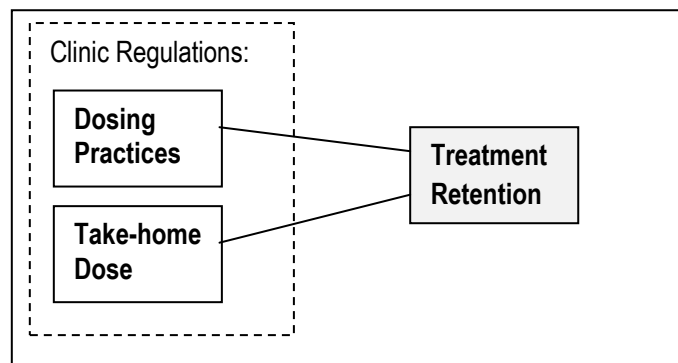
Figure 6.8 Test of Proportional Hazards Assumption

Variables	rho	χ^2	df	Prob > χ^2
Dose	0.02608	0.04	1	0.8468
Take-home dose	0.01232	0.01	1	0.9114
Global test		0.06	2	0.9726

6.3.3. Conclusion of the Treatment Retention Predictors of the Program Characteristics

Predictors of program characteristics for treatment retention were maximum dose and take-home dose. Both predictors worked independently in influencing treatment retention. The model indicated that higher dose reduced the likelihood to drop out by 42.8 percent, while more frequent THD decreased the dropout rate by 3.4 percent. Thus, for the model of program characteristics, the most influential predictor for treatment retention was the maximum dose received by the clients. By this result, the conceptual framework underlying this analysis (see Figure 3.1) that hypothesized the clinic regulations through dosing and take-home dose practices was supported. These two variables affected treatment retention independently but the most influential predictor was dosing practices (Figure 6.9). Thus, dose had stronger tendency to influence treatment retention than THD.

Figure 6.9 Predictors of Program Characteristics on Treatment Retention



6.4. The Impact on Treatment retention of Client Characteristics

The potential predictive variables of client characteristics on treatment retention were Age, Lifetime Heroin Use, Imprisonment History, Physical Health, Crime, Perceived Treatment Accessibility, Treatment Motivation, Psychological Status, Social Status, Treatment Engagement and Subjective Feelings of Methadone's Sufficiency. HIV status was not considered as a potential variable in this study because this information was missing in 39 percent of the total participants. Gender was not considered either because the proportion between male and female was very unbalanced, namely 90:10 (male: female).

Client characteristics were measured as either continuous or categorical variables. Variables such as age, lifetime heroin use, health status and all scales of client's perception of self and treatment were treated as continuous variables. Variables such as imprisonment history, financial capability, travelling time, and transportation mode were treated as categorical variables. The statistical analysis procedures were similar to the ones as written in the Introduction of this chapter.

6.4.1. Univariate Analysis

Potential variables included age, lifetime heroin use, health status, crime, treatment history and treatment accessibility issues such as monthly expenses, travelling time and transportation mode. Imprisonment history as a part of treatment history was treated specifically, as this variable has previously been shown to have a strong influence toward treatment retention (Capplehorn, 1998). Table 6.3 shows the results of the statistical analysis of the above variables. From the results of Cox-proportional hazard z scores at table 6.3, only variables age and lifetime heroin use met the previously set threshold of $p \leq 0.25$ and were included in further modelling.

Table 6.3 Univariate Analysis of Demographic & Clinic Background towards Treatment Retention

Variables:	Results:
Age	$z = -1.43$; Prob $> z = 0.151$
Lifetime Heroin Use	$z = 1.60$; Prob $> z = 0.109$
Health Status	$z = 0.08$; Prob $> z = 0.940$
Crime Status	$z = -0.95$; Prob $> z = 0.343$
Treatment History	$\chi^2 = 4.53$; Prob $>\chi^2 = 0.3393$
Imprisonment History	$\chi^2 = 1.50$; Prob $>\chi^2 = 0.2200$
Financial Support	$\chi^2 = 5.77$; Prob $>\chi^2 = 0.2170$
Transportation Mode	$\chi^2 = 2.84$; Prob $>\chi^2 = 0.8285$
Treatment Expenses (continuous variable)	$\chi^2 = 2.84$; Prob $>\chi^2 = 0.5851$
Treatment Expenses (dichotomous variable)	$\chi^2 = 2.04$; Prob $>\chi^2 = 0.1536$
Travelling Time	$\chi^2 = 0.86$; Prob $>\chi^2 = 0.8340$

Treatment history, which included all treatment modalities, was not eligible for further analysis with $\chi^2 = 4.53$ ($p = 0.3393$), while history of incarceration yielded a χ^2 of 1.50 ($p = 0.22$). Therefore, imprisonment history was eligible to be included for further analysis (table 6.3).

The variables included in the Accessibility scale are financial support, transportation mode, treatment expenses and travelling time. They were categorical variables (table 6.3). The log rank test analysis yielded p values greater than 0.25 for all variables, which means those variables were not considered to have potential in influencing treatment retention. Further analysis was undertaken by converting these categories into dichotomous variables. Treatment expense expressed as a dichotomous variable was the only eligible variable for modelling, with a χ^2 value of 2.04 ($p = 0.153$).

Table 6.4 below shows the univariate analyses of clients' perception scales. In Treatment Motivation scales, there were two variables that potentially influence treatment retention, namely Treatment Need, with a z score of 1.37 ($p = 0.1695$) and Pressure for Treatment with z score of 1.26 ($p = 0.207$). Thus, these two variables were

included in further modelling. Among variables in the Psychological Functioning scale, only self efficacy was considered to be eligible for further analysis. It had a z score of 1.54 ($p = 0.1200$). None of the subscales of Social Functioning was eligible for further analysis. From the four subscales of Treatment Engagement, there were two which had potential for further modelling, namely Treatment Participation with a z score of -1.18 ($p = 0.2518$) and client's belief in the program, with a z score of -1.40 ($p = 0.1773$). The perceived treatment accessibility, measured as participants' perception of their ability to access treatment was also included for further analysis, with a z score of -1.82 ($p = 0.0776$).

Table 6.4 Univariate Analysis of Perception on Self & Treatment towards Treatment Retention

Scales:	Subscales:	Results:
Treatment Motivation	Desire for help	$z = 0.35$; Prob $> z = 0.728$
	Treatment Readiness	$z = -0.10$; Prob $> z = 0.924$
	Treatment Need	$z = 1.37$; Prob $> z = 0.169$
	Pressure for Treatment	$z = 1.26$; Prob $> z = 0.207$
Psychological Functioning	Self-esteem	$z = 0.71$; Prob $> z = 0.478$
	Depression	$z = -0.59$; Prob $> z = 0.555$
	Anxiety	$z = 0.55$; Prob $> z = 0.580$
	Decision making	$z = -0.29$; Prob $> z = 0.772$
	Self Efficacy	$z = 1.54$; Prob $> z = 0.125$
Social Functioning	Hostility	$z = 0.39$; Prob $> z = 0.694$
	Risk Taking	$z = -0.16$; Prob $> z = 0.870$
	Social Consciousness	$z = -0.50$; Prob $> z = 0.617$
Treatment Engagement	Treatment Satisfaction	$z = -0.40$; Prob $> z = 0.687$
	Counselling Rapport	$z = -0.21$; Prob $> z = 0.833$
	Treatment Participation	$z = -1.18$; Prob $> z = 0.239$
	Client's Belief in MMT	$z = -1.40$; Prob $> z = 0.162$
Client's Perception of Treatment Accessibility		$z = -1.82$; Prob $> z = 0.069$

Subjective feelings towards methadone treatment had no effect on treatment retention (table 6.5). Therefore, none of these variables were included in the further model.

Table 6.5 Univariate Analyses of Perception on Methadone Treatment towards Treatment Retention

Scales	N = 178; Time at risk = 2945		
	Log likelihood	LR chi2(1)	Prob >chi2
How well has methadone been holding you?	-309.15613	0.15	0.6950
How much of a “buzz” does methadone give you?	-309.23222	0.00	0.9691
How many side effects do you feel from methadone?	-309.212	0.04	0.8378
How much do side effects from methadone bother you?	-308.99394	0.48	0.4893
How much do you like methadone?	-309.11361	0.24	0.6251
Does methadone make you feel more “normal”?	-309.07288	0.32	0.5715
How much do you crave heroin while on methadone?	-309.22267	0.02	0.8859

In conclusion, the multivariate model to examine the effect of clients’ characteristics on treatment retention at the individual level was developed using age, lifetime heroin use, imprisonment history, financial expenses of methadone treatment, treatment need, pressure for treatment, self-efficacy, treatment participation, client’s belief in treatment and perceived treatment accessibility.

6.4.2. Multivariate Analysis

The first multivariate analysis model of client characteristics at the individual level involves all potential clients’ characteristics variables (figure 6.10). Lifetime heroin use, financial expense, treatment need, pressure for treatment, treatment participation and clients’ belief towards treatment were not significant at $p = 0.05$. Although this study has set up $p = 0.05$ as the requirement of the final model, the interaction of lifetime heroin use and treatment accessibility in the further models

yielded a significant value. Therefore, the variable of lifetime heroin use, which had a $p = 0.086$ in the first model, was included in the next modelling.

Figure 6.10 First Model of Clients' Characteristics: multi-variate analysis of their contribution to predicting treatment retention in MMT

No. of subjects = 143; No. of observation = 148; No. of failures = 49 Time at risk = 23427; LR $\chi^2 = 24.07$ Log likelihood = - 221.83161; Prob $> \chi^2 = 0.0074$						
Variables	Coeff	SE	z	P > z	95% CI	
Age	-.0838427	.037026	-2.26	0.024	-.1564123	-.0112731
Lifetime heroin use	.089234	.0519113	1.72	0.086	-.0125102	.1909783
Imprisonment history	-.6734707	.3089475	-2.18	0.029	-1.278997	-.0679448
Financial expenses	-.2283227	.3276783	-0.70	0.486	-.8705603	.4139149
Treatment Need	.044038	.0369192	1.19	0.233	-.0283223	.1163982
Pressure for treatment	.0452056	.030745	1.47	0.141	-.0150535	.1054647
Self efficacy	.0757642	.0350467	2.16	0.031	.0070739	.1444544
Treatment participation	-.0739051	.0483013	-1.53	0.126	-.1685738	.0207637
Clients' belief towards treatment	.0038819	.0461134	0.08	0.933	-.0864986	.0942625
Perceived treatment accessibility	-.0426254	.0201367	-2.12	0.034	-.0820926	-.0031582

The second multivariate analysis of the clients' characteristics includes age, lifetime heroin use, imprisonment history, self-efficacy and perceived treatment accessibility (figure 6.11).

Figure 6.11 Second Model of Clients' Characteristics: multi-variate analysis of their contribution to predicting treatment retention in MMT, omitting non-significant variables from the first iteration

No. of subjects = 178; No. of observation = 185; No. of failures = 62 Time at risk = 29415; LR $\chi^2 = 18.05$ Log likelihood = - 300.21042; Prob $> \chi^2 = 0.0029$						
Variables	Coeff	SE	z	P > z	95% CI	
Age	-.0717205	.0301676	-2.38	0.017	-.1308479	-.0125931
Lifetime heroin use	.0851537	.0389276	2.19	0.029	.008857	.1614504
Imprisonment history	-.5199313	.2643379	-1.97	0.049	-1.038024	-.0018386
Self efficacy	.0594374	.0282558	2.10	0.035	.0040571	.1148177
Perceived treatment accessibility	-.0461605	.0171852	-2.69	0.007	-.0798428	-.0124781

The above second model was a non-interactive model. It shows that all potential variables of the clients' characteristics were significant at $p = 0.05$. Therefore, all variables were included in a further interactive model.

An analysis of all possible interactive variables yielded a significant interactive model between lifetime heroin use and perceived treatment accessibility (figure 6.12). Thus, the final model of client characteristic variables that acted as predictors for treatment retention was an interactive model incorporating the interaction between lifetime heroin use and perceived treatment accessibility.

Figure 6.12 Final Model of Client Characteristics

No. of subjects = 178; No. of observation = 185; No. of failures = 62 Time at risk = 29415; LR $\chi^2 = 23.51$ Log likelihood = - 297.47786; Prob > $\chi^2 = 0.0006$						
Variables	Coeff	SE	z	P > z	95% CI	
Age	-.0639567	.0288883	-2.21	0.027	-.1205766	-.0073367
Lifetime heroin use	-.4065294	.2035988	-2.00	0.046	-.8055758	-.007483
Imprisonment history	-.5919602	.265995	-2.23	0.026	-1.113301	-.0706196
Self efficacy	.064628	.0285138	2.27	0.023	.0087421	.120514
Perceived treatment accessibility	-.1567267	.0468918	-3.34	0.001	-.248633	-.0648204
Interaction between lifetime heroin use and perceived treatment accessibility	.0141973	.005632	2.52	0.012	.0031587	.0252359

One of the main assumptions in applying a Cox proportional hazard approach to test a model is proportionality. The test of the proportional hazard assumption of the interactive model above yielded non-significant results for all variables: age, imprisonment history, self-efficacy, and the interaction between lifetime heroin use and perceived treatment accessibility (figure 6.13).

Figure 6.13 Test of Proportional Hazards Assumption

Variables	ρ	χ^2	df	Prob > χ^2
Age	0.07681	0.25	1	0.6154
Lifetime heroin use	-0.06654	0.31	1	0.5779
Imprisonment history	0.10872	0.77	1	0.3813
Self efficacy	-0.08709	0.47	1	0.4933
Perceived treatment accessibility	0.00528	0.00	1	0.9655
Interaction of heroin use & treatment accessibility	0.05223	0.19	1	0.6602

This confirmed that the final model of client characteristics did not violate the proportionality assumption. Thus, the standard Cox regression model was used appropriately in analysing the model.

Figure 6.14 Hazard Ratios of the Final Model

No. of subjects = 178; No. of observation = 185; No. of failures = 62 Time at risk = 29415; LR χ^2 = 23.51 Log likelihood = - 297.47786; Prob > χ^2 = 0.0006					
Variables	Hazard Ratio	SE	z	P > z	95% CI
Age	.9380457	.0270985	-2.21	0.027	.8864092 .9926902
Lifetime heroin use	.6659575	.1355882	-2.00	0.046	.4468306 .9925449
Imprisonment history	.5532418	.1471595	-2.23	0.026	.328473 .9318163
Self efficacy	1.066762	.0304174	2.27	0.023	1.00878 1.128076
Perceived treatment accessibility	.8549377	.0400896	-3.34	0.001	.7798661 .9372358
Interaction between lifetime heroin use and perceived treatment accessibility	1.014299	.0057126	2.52	0.012	1.003164 1.025557

Figure 6.14 above shows the hazard ratios (or relative risks) of the client characteristic model. With those ratios, the model indicated that if age was increased by one year and other variables remained constant, the rate of dropout decreased by 6.2 percent. If the participants had an imprisonment experience while the other variables remained constant, the dropout rate decreased by 44.7 percent. If the participants' perceived capability to access treatment increased by one category (e.g. from agreed to strongly agreed) and the duration of heroin use was also longer by one year, while the

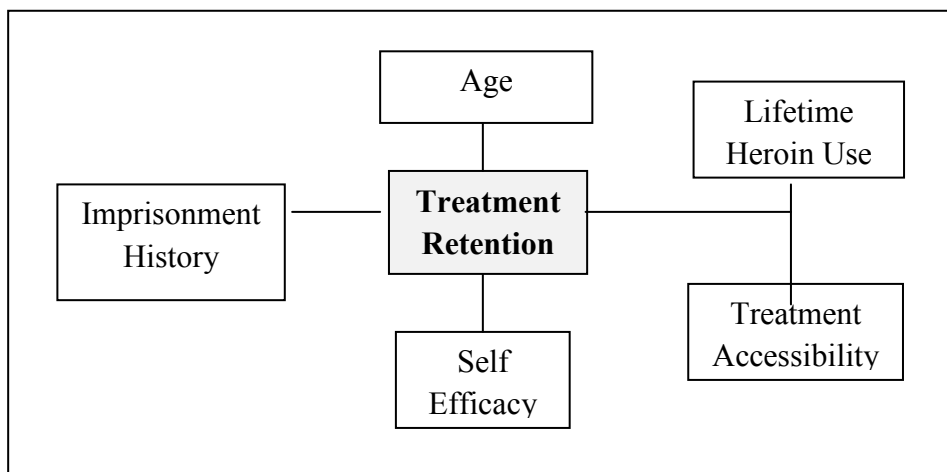
other variables remained constant, the dropout rate decreased by 42.3 percent. If the participants had problems accessing MMT but had similar duration of heroin use and the other variables were constant, then the dropout rate decreased by 33.4 percent. The effect of self-efficacy variable on treatment retention was in a reverse way. If the participants' self-efficacy increased one category (e.g. as above) and other variables were constant, the likelihood of dropout increased by 6.7 percent.

6.4.3. Conclusion of the Treatment Retention Predictors of the Client Characteristics

The client characteristics that were significant predictors of treatment retention were age, imprisonment history, self-efficacy and the interaction between perceived treatment accessibility and lifetime heroin use. Participants who were older and had an imprisonment experience had less chance of dropping out of MMT. Stronger perception of the ability to access the program was also increased the likelihood of the participants to remain in treatment. However, the duration of heroin use moderated the effect of perceived accessibility in affecting treatment retention. The interaction between perceived accessibility and lifetime heroin use in predicting treatment retention was interesting. Previous studies have shown that accessibility factors are significant in retaining people into treatment (Borisova and Goodman, 2004; Beardsley et al, 2003; Friedmann et al., 2001). Years of opiate use have also been found as significant predictor of treatment retention (Deck and Carlson, 2005). The longer they use heroin, the greater the chance to experience any negative events that motivating them to seek treatment. Thus, interaction between those two variables (the perceived accessibility and the lifetime heroin use) strengthens the effect on treatment retention. In general, the above results supported previous study that client with a higher level of severity might be more amenable with the program (Zhang et al., 2003).

Variable of self-efficacy worked on treatment retention in a reverse way. Higher level of self-efficacy at baseline had an effect in increasing the likelihood of dropping out of treatment. Self-efficacy is defined as an individual's perception of his or her ability to perform on a certain task (Bandura, 1982). The level of someone's self-efficacy will determine whether he or she sticks to the treatment (Hayon, 2008). Thus, the fact that this variable in this study worked in a reverse way was surprising. Most possible explanation was that the higher level of self-efficacy reflected participants' confident to control their life (see the Instrument in the appendix g). They may think that they did not seriously need to remain in treatment.

Figure 6.15 Predictors of Client Characteristics for Treatment Retention



In the conceptual framework underlying this study (see figure 3.2), the clients' characteristic that was hypothesized to be the most important predictor of treatment retention was treatment satisfaction. However, the final model of clients' characteristics shows that age, imprisonment history, self-efficacy and the interaction between perceived treatment accessibility and lifetime heroin use were the significant predictors of treatment retention (see Figure 6.15). Univariate analysis showed that the z score of treatment satisfaction was -0.40 ($p = 0.687$) (table 6.4). Thus, the hypothesis that treatment satisfaction would be the main client characteristic predictor for treatment

retention was rejected. In terms of the strength of each predictor in affecting treatment retention, imprisonment history was the strongest predictor, followed by the interaction between lifetime heroin use and perceived treatment accessibility as the second strongest, then the third was self-efficacy and the weakest was age.

6.5. The Impact on Treatment Retention of Social Characteristics

The following section will focus on the analysis of social characteristics and their effects on MMT treatment retention. The analysis followed the previous procedures (see the Introduction of this chapter). There were four potential predictive variables on treatment retention of social characteristics: the frequency of Family Attendance on the clinic (called Actual Family Support), the Clients' Perception of Family Support, the Clients' Perception of Peer Support and the Clients' Perception of Social Support.

Table 6.6 Univariate analysis of Social Characteristics

Variables:	Results:
Actual Family support as categorical data	$\chi^2 = 1.50$; Prob > chi2=0.4728
Actual Family support as continuous data	$z = -1.64$; Prob > $z = 0.102$
Client's Perception of Family support	$z = 0.49$; Prob > $z = 0.623$
Client's Perception of Peer Support	$z = 1.15$; Prob > $z = 0.249$
Client's Perception of Community Support	$z = 0.14$; Prob > $z = 0.888$

Actual family support was treated in two ways, as a categorical variable and as a continuous variable. In the categorical variable, the subjects were divided into three groups: firstly, those whose families did not get involved in the treatment program at all; secondly, for those whose families were involved occasionally (accompanied the clients less than 10 times over the study period) and thirdly, those whose families were involved frequently (more than 10 times over the study period). The statistical analysis of this categorical variable showed a χ^2 score of 1.50 ($p = 0.4728$), while the continuous data showed a z score of -1.64 ($p = 0.102$) (table 6.6). Therefore, family support through

treatment attendance (actual support) as a continuous variable was included in further analyses.

Data related to participants' perception of family support, peer support and community support were treated as continuous variables (table 6.6). Among the social supports, only perceived peer support was considered eligible for further analysis ($z = 1.15$; $p = 0.2467$).

In order to determine the potential effect of social characteristics on treatment retention, the analysis used a multivariate analysis using Cox regression (figure 6.16). The analysis found that the model was not significant. However, it is important to keep in mind the social characteristics of the clients within the Indonesian context, such as a significant role for the family in determining a treatment plan (Rachma, 1997; Subandi, 2006). It was decided to include variables of peer support and actual family support in the final model of the overall characteristics in order to have a clearer description of the role of social characteristics. Thus, those two variables were included in further final analysis.

Figure 6.16 Model of Social Characteristics

No. of subjects = 168; No. of observation = 175; No. of failures = 53					
Time at risk = 28879; LR $\chi^2 = 5.48$					
Log likelihood = - 259.64265; Prob > $\chi^2 = 0.0645$					
Variables	Coef	SE	z	P > z	95% CI
Actual family support	-.0492822	.0293738	-1.68	0.093	-.1068539 .0082894
Peer support	.0465339	.0374566	1.24	0.214	-.0268797 .1199474

6.5.1. Conclusion of the Treatment Retention Predictors of the Social Characteristics

The Cox regression analysis to examine the influence of social characteristic variables on treatment retention found that the model was not significant. Therefore, there was no unifying model of social characteristic predictors on treatment retention.

Thus, the conceptual framework (figure 3.3) was not supported. Nevertheless, both potential variables with $p < 0.25$ in the univariate analysis, namely actual family support through treatment attendance and perceived peer support, were still included in the analysis of the final model of the influence of overall characteristics, as previous studies had shown social factors to be important in the Indonesian context (Rahma, 1997; Forshee, 2006).

6.6. The Impact on Treatment Retention of Overall Characteristics

The analysis of the model of program characteristics yielded the relationship that Dose and Take-home Dose (THD) were significant predictors of treatment retention. The variable of Experience of the Clinic was not significant in either the univariate or multivariate model. However, empirical observation showed that staff gained better skills in treating IDU through the length of their service. Thus, three variables from the program characteristics were included in the overall final model, namely: Dose, THD and Experience of the Clinic.

The analysis of the influence of clients' characteristics on treatment retention established a significant model that included several variables, namely: Age, Imprisonment History, Self Efficacy and the interaction between Lifetime Heroin Use and Perceived Accessibility of the clinic. Although this model had only three single variables and one interaction variable that contributed significantly, some other client characteristics were also added to the overall final models. These, in particular, were variables with p-values less than or equal to 0.25 in the univariate analysis. Variables that fulfilled this criterion were Treatment Need, Pressure for Treatment, Treatment Participation and Client's Belief in the Program.

The multivariate analysis of social characteristics did not reveal any significant predictors influencing treatment retention. Nevertheless, a univariate analysis on the

variable of Family Support through Treatment Attendance (called Actual Family Support) was significant at a p-value of 0.05; while the variable of Perceived Peer Support had a p-value of 0.2467, thus fulfilling the threshold requirement for further analysis. Hence, both of these variables were included in the final analysis.

6.6.1. Models of the Predictive Variables

Overall, thirteen single variables and two interaction variables were included in the final analysis model. The single variables were Dose, THD, Experience of the Clinic, Age, Lifetime Heroin Use, Imprisonment History, Treatment Need, Pressure for Treatment, Self Efficacy, Treatment Participation, Belief towards Program, Perceived Peer Support and Actual Family Support. The interaction variables were Experience of the Clinic and THD, and Lifetime Heroin Use and Perceived Accessibility. The interaction between THD and Experience of the Clinic was based on an empirical assumption that flexibility in giving THD was determined by the experience of the clinic staff.

In finding the most suitable model, all possible models were examined. The consideration included a model of all potential variables as well as models omitting some potential variables. To arrive at the best final model, different thresholds for p-values were predetermined at different stages of analysis. Overall, there were three stages of analysis. A p-value of ≤ 0.25 was used to screen potential variables in the first stage; a p-value of ≤ 0.1 was used in the second stage; and a p-value of ≤ 0.05 was set for significance in the third stage for the final model.

The first model, which contained all potential variables, produced p-values greater than 0.25 for the variables of Imprisonment History ($p = 0.342$), Pressure for Treatment ($p = 0.351$), Treatment Participation ($p = 0.303$) and Family Support through Treatment Attendance, or Actual Family Support ($p = 0.744$). Thus, these variables were not

included in the second model. The second model produced p-values greater than 0.10 for the interaction between Lifetime Heroin Use and Perceived Accessibility (p = 0.135), Lifetime Heroin Use (p = 0.237), Self-efficacy (p = 0.109) and Treatment Need (p = 0.157). Therefore, these variables were not included in further modeling. The third model found that all remaining variables had p-values ≤ 0.05 . Hence, the third model became the final model.

The third model (or the final model), which reached statistical significance at the p-value of 0.05 (Figure 6.17), included Dose, Age, Perceived Accessibility, Belief towards Program, Perceived Peer Support and the interaction of Take-home Dose and Experience of the Clinic.

Figure 6.17 Final Model of Treatment Retention Predictors

Variables	Coef	SE	z	P > z	95% CI
Dose	-.7213241	.2836641	-2.54	0.011	-1.277296 -.1653527
Take-home dose	-.0953726	.0283038	-3.37	0.001	-.1508471 -.0398981
Experience of the clinics	-.5088457	.3352915	-1.52	0.129	-1.166005 .1483136
Interaction between experience of the clinics and take-home dose	.0709225	.029181	2.43	0.015	.0137287 .1281163
Age	-.0962642	.0361695	-2.66	0.008	-.1671551 -.0253733
Perceived accessibility	-.0482341	.0185081	-2.61	0.009	-.0845093 -.0119589
Belief towards program	-.0763955	.0342959	-2.23	0.026	-.1436142 -.0091768
Perceived peer support	.0983424	.0419605	2.34	0.019	.0161013 .1805834

No. of subjects = 171; No. of observation = 178; No. of failures = 57
 Time at risk = 28816; LR $\chi^2 = 70.86$
 Log likelihood = -247.12924; Prob > $\chi^2 = 0.0001$

To determine the appropriate usage of a Cox proportional hazard model for the above final model, the Schoenfeld method was applied (Kleinbaum and Klein, 2005). Figure 6.18 shows that all variables were not significant except for the variable of Take-home Dose and its interaction with Experience of the Clinic.

Figure 6.18 Test of proportional hazards assumption

Variables	ρ	χ^2	df	Prob > χ^2
Dose	-0.07226	0.34	1	0.5609
Take-home dose	0.22845	5.58	1	0.0182
The experience of the clinic	0.16030	1.73	1	0.1888
Interaction between the experience of the clinic and take-home dose	-0.24229	6.17	1	0.0130
Age	0.00615	0.00	1	0.9630
Perceived accessibility	0.01744	0.02	1	0.9019
Belief towards program	-0.17065	2.32	1	0.1278
Perceived peer support	0.09403	0.53	1	0.4682
Global test		8.84	8	0.3559

As Kleinbaum and Klein recommended (2005), a graphical procedure using a plot option for the variables of THD and the interactional variable of THD – Experience of the clinic must be proceeded to ensure the appropriateness of the proportional hazard approach.

Figure 6.19 Plot of THD

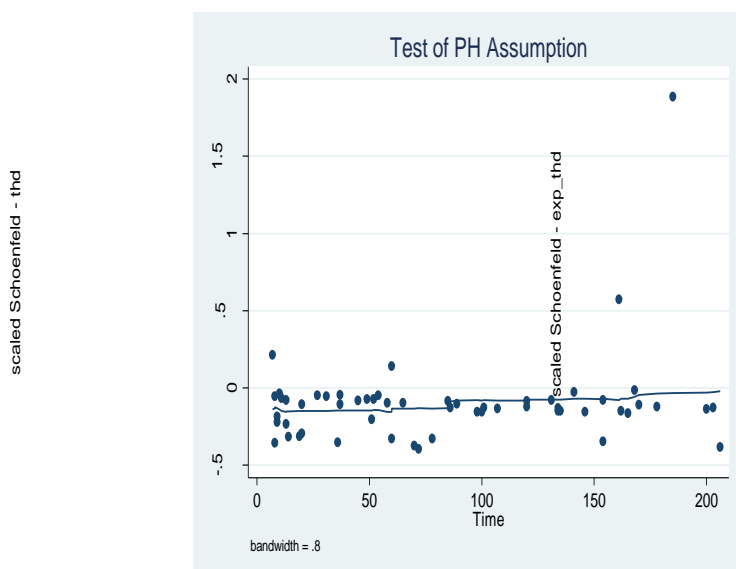
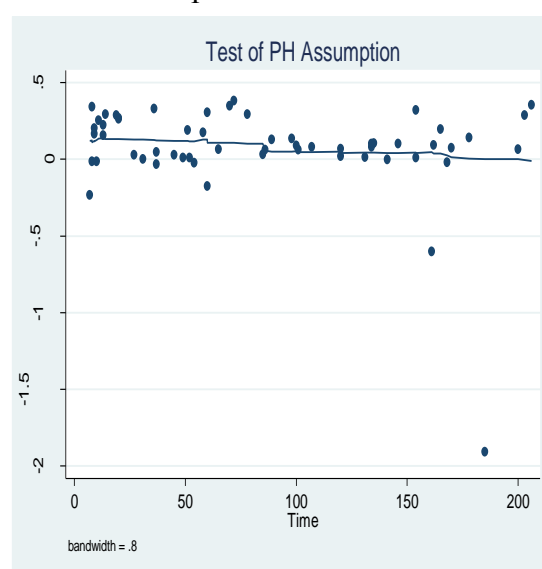


Figure 6.20 Plot of THD & Experience of the Clinic



The plot option produced a plot of the scaled Schoenfeld residuals for THD variable (Figure 6.19) and THD – Experience of the Clinic interactional variable (Figure 6.20). The curve of both plots look relatively horizontal which indicated that the scaled Schoenfeld residuals of the both variables were independent of survival time, which indicated that they were not explicitly violating the proportionality assumptions

(Kleinbaum and Klein, 2005). Thus, the usage of Cox proportional hazard approach for the final model was appropriate. The final model and interpretation of the hazard ratios for each variable is shown in Figure 6.21. The hazard ratios (called relative risks) of the model show several important relationships. Most of the variables in the model increased the likelihood of participants to remain in the program. It included single variables of Dose, Age, Perceived Treatment Accessibility, Believed in Treatment and the interactional variable of THD and Experience of the Clinic. Variable of Perceived Peer Support worked in a reverse way, predicted the likelihood of participants to drop out of treatment.

Figure 6.21 Hazard Ratios of Treatment Retention Predictors

Variables	Hazard Ratio	SE	z	P > z	95% CI
No. of subjects = 171; No. of observation = 178; No. of failures = 57 Time at risk = 28816; LR χ^2 = 70.86 Log likelihood = - 247.12924; Prob > χ^2 = 0.0000					
Dose	.4861082	.1378914	-2.54	0.011	.2787903 .8475947
Take-home dose	.9090342	.0257292	-3.37	0.001	.8599792 .9608873
The experience of the clinic	.6011891	.2015736	-1.52	0.129	.3116093 1.159877
Interaction between the experience of the clinic and take-home dose	1.073498	.0313258	2.43	0.015	1.013823 1.136685
Age	.908224	.03285	-2.66	0.008	.8460684 .9749459
Perceived accessibility	.9529107	.0176366	-2.61	0.009	.9189631 .9881123
Belief towards program	.9264497	.0317734	-2.23	0.026	.8662219 .9908651
Perceived peer support	1.10334	.0462967	2.34	0.019	1.016232 1.197916

The interpretations of the hazard ratios of the single variables (figure 6.21) were as follow: if the dose was altered from low to high and other variables were constant, the rate of dropout decreased by $(100 - 48.6\%) = 51.4$ percent. If the participant's age was one year older and other variables were constant, the rate of dropout decreased by $(100 - 90.8\%) = 9.2$ percent. If the participant's belief in program was increased by one category (e.g. from agreed to strongly agreed) while other variables remained constant,

the dropout rate was decreased by $(100 - 92.6\%) = 7.4$ percent. If the participant perceived their capability in accessing the program was increased by one category (e.g. from agreed to strongly agreed) while other variables remained constant, the dropout rate was decreased by $(100 - 95.3\%) = 4.7$ percent. If participants perceived their peer support as one category higher (e.g. from agreed to strongly agreed) and other variables were constant, the dropout rate increased by 10.3 percent.

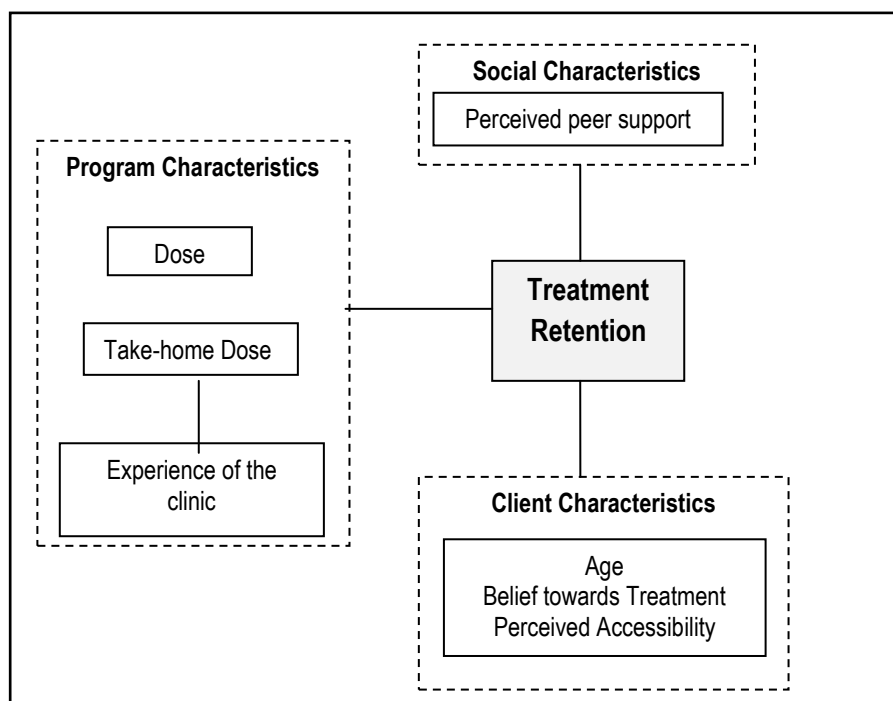
The interpretation of the hazard ratio of the interactional variable (Figure 6.21) depended on the frequency of the THD and the clinic which THD was released. If the THD was changed to be more frequent and it was released by an experienced clinic (more-abstinence oriented clinic) while other variables remained constant, the hazard ratio would be equal to $\exp((-0.093726 + (-).5088457) + .0709225) = 0.587635$. Thus, the dropout rate would be decreased by $(100\% - 58.8\%) = 41.2$ percent. If the THD was similarly frequent as the above but being released by a non-experienced clinic (less-abstinence oriented clinic) while other variables remained constant, the hazard ratio would be equal to $\exp(-.0953726) = 0.909034$. Thus, the dropout rate would be decreased only by $(100-90.9) = 9.1$ percent.

6.6.2. Conclusion of the Treatment Retention Predictors of the Overall Characteristics

The statistical analysis of the overall characteristics and their impact on treatment retention (Figure 6.21), did not confirm the Conceptual Framework of Overall Characteristics (Figure 3.4). The program characteristic predictors of treatment retention for MMT in Indonesia were Dose and the interaction between Take-home Dose and Experience of the Clinic. The client characteristic predictors of treatment retention were Age, Believed in Program and Perceived Program Accessibility. The only social characteristic predictor of treatment retention was the Perceived Peer Support, but this variable operated in a negative direction.

The strength of each variable in predicting treatment retention was indicated by the hazard ratio. The strongest predictors were Dose, which reduced the likelihood of dropping out of treatment by 51.4 percent, followed by the interaction between Take-home Dose and Experience of the Clinic, which reduced dropout likelihood by 9.1 percent or 41.2 percent, depending on the experience of the clinic. Other variables that affected treatment retention contributed between 4 percent and 10 percent. Therefore, the final results support the main hypothesis that in Indonesia the clinic regulations through dose and the interaction between take-home dose and experience of the clinic were the primary predictors of treatment retention (Figure 6.23).

Figure 6.23 Predictors of Treatment Retention of MMT in Indonesia



Interestingly, the participant's perception of peer support worked in an opposite direction from the initial expectation, in that, a perception of strong peer support increased the likelihood of dropping out of treatment. The domain of peer support consisted of twelve statements: four statements referred to support from peers within MMT and eight statements referred to support from peers outside MMT. An example of

a statement that reflects peer support within MMT was the perception that other MMT clients care about them and their problems. Examples of statements that reflect peer support outside MMT were “having friends who could be counted on to help”; “having good friends who do not use drugs” and “having support from friends in turning their life around”. It appears that high peer support may act as an inducement to leave treatment early. An interpretation of this result may be that if the participant felt greater support from friends, then MMT was not the only solution to improve their life.

The less-abstinence-oriented clinic (Tanjung Priok) was less experienced in treating methadone clients than the other clinics (RSKO and Sanglah). Bell (1995) showed that staff with limited knowledge of addiction and methadone treatment tend to implement stricter clinic regulation. Thus, the sense of the Tanjung Priok staff to identify the “real need” of clients in having THD had not been well-developed at the beginning of program establishment.

6.7. Summary and Conclusions

This study found that treatment retention rates in Indonesia were comparable with those of western-based studies (Both et al, 2004; Bell et al., 2002; Coviello et al., 2004). This study confirmed the primary hypothesis that predicted that program characteristics would be the main predictors of treatment retention in MMT in Indonesia. The clinic regulations through dosing practices (dose and take-home dose practices) were the primary predictors of treatment retention. Provision of a high dose of methadone (≥ 60 mg) proved important in retaining people in MMT. A policy allowing frequent take-home doses also helped to keep people in MMT. However, the degree of effectiveness of the take-home dosing policy was influenced by the duration of experience of the clinic in treating clients with methadone. At least one year experience in providing

methadone treatment for clients was needed to enhance retention, particularly for the effectiveness of take-home doses in retaining clients.

This study did not confirm the primary hypothesis that predicted that actual family support and treatment satisfaction would be the minor predictors of treatment retention in MMT in Indonesia. Therefore, predictors of treatment retention of MMT in Indonesia were mainly program characteristics, supported by some client and social characteristics, particularly age, belief in the program and perceived accessibility of the clinic.

Chapter 7

Outcomes of Treatment Retention

7.1. Introduction

Besides studying treatment retention in MMT in Indonesia and its predictive variables, this study also examined the outcome of treatment retention as a secondary hypothesis by comparing behavioural and perception status between two comparison groups: those who remained in treatment over the study period and those who had a dropout experience during the study period. The hypothesis was that people who remained in treatment for at least three months would have better outcomes. The primary outcomes examined in this chapter were Heroin Use, Criminal Involvement, Physical Health Status and Depression Status. Previous studies in other countries have shown that treatment retention improved those variables (Utami et al., 2005; Lawrison, et al., 2008; Ward et al., 1998). Several other behavioural and psychological variables were also examined as secondary outcomes, namely Alcohol Use, Other Opiate Use, Cannabis Use, Sedative Use, Anxiety Status, Self-esteem Status and Self-efficacy Status. These variables have not previously been studied as potential benefits of remaining in treatment.

The number of participants who had no dropout experience over the study period was 126 and the number of participants who had ever dropped out was 52. From the total of 178 participants, 131 of them (73.59 percent) were completely re-assessed at 3-months and 6-months of follow-up. This included both populations: those who remained in treatment and those who dropped out. However, the follow-up rates between participants who continued in treatment over the study period and those who had a dropout experience were different (table 7.1). The first group had a relatively consistent follow-up rate at 3-month and 6-month reviews (over 83 percent), while the

second group had only about 75 percent follow-up rate at 3-month review and then significantly decreased to about 50 percent at the 6-month review. Some of the dropout participants (particularly in Tanjung Priok) had moved out of town, gone sailing, or were imprisoned in the prisons or the detention centres.

Table 7.1 Follow-up rates in two comparison groups by each review

Assessment stages	Continuing in MMT	Dropouts
Follow-up rate at 3-month review	100/116 = 86.2%	47/62 = 75.8%
Follow-up rate at 6-month review	97/116 = 83.6%	32/62 = 51.6%

To have a meaningful comparable result in the outcome evaluation, the suggested follow-up rate is above 70 percent (McLellan et al, 1996). A follow-up rate of less than 70 percent makes the interpretation of findings more difficult or in other words, the results had greater possibility of having type II error.

The statistical procedure applied was a one-way multivariate analysis of variance (MANOVA) which allows one categorical independent variable and two or more dependent variables. Applying MANOVA for missing data needed an imputation method to avoid listwise deletion of cases (Twisk & de Vente, 2002). The imputation model chosen was the last value carried forward (LVCF) approach.

In addition, an analysis of Relative Risk (RR) was also presented. Because calculation of RR requires a 2 X 2 table, continuous outcome variables were categorized into dichotomous variable (yes – no or low – high). For continuous variables of Heroin Use, other Illicit Drug Use and Criminal Involvement, an absolute value of zero was used to distinguish between participants who had been involved (code 1) and who had not been involved (code 0) with drug use and crime in the last 30 days before interview. For other continuous variables of health status, depression status and other psychological status, this study applied a receiver operating characteristic (ROC) curve

to determine cut off points. ROC curves allow us to classify continuous data into binary data using a graphical plot of the sensitivity and 1 – specificity. Code 0 was applied to lower status and code 1 for higher status.

7.2. Illicit Drug Use

The first indicator in looking at the potential benefit of participating in MMT is the usage of secondary drugs, **particularly heroin**. This study found that among those who remained in treatment, 130 participants (97.7 percent) at the 3rd-month follow-up showed lower frequencies of heroin use than at baseline. Only one participant at the 3rd month review had a higher frequency of using heroin. Compared to the participants who dropped out, there were significant differences in both follow-up times (table 7.2). Relative risks (RR) of not using heroin at follow-up times were 1.3 and 1.14, respectively. The risks of not using heroin for people who remained in program were 30% higher at 3-months follow-up and 14% higher at 6-months follow-up than for people who dropped out from program. Thus, 3 months remaining in the program was a critical period to achieve significant reduction of heroin use. The reduction was sustained in the 6th month. Other risk indices of heroin use at the 3rd month follow-up showed that absolute risk reduction (ARR) for not using heroin among participants who remained in program was 21% and relative risk reduction (RRR) was 70%. The number of patients we needed to treat (NNT) with methadone maintenance treatment to prevent heroin use in one participant was 5.

Table 7.2 also showed that illicit drug intake prior to the program was relatively similar for both populations, except for the category of “other opiates”. People who later remained in the program had a 10% higher rate **of not using other opiates** than people who later dropped out from the program. However, other than heroin, there were no significant differences in illicit drug use between participants who remained in

program and those who dropped out from program at both follow-up times. This result was not surprising, because most of them did not use other drugs in the last month prior to interview sessions, thus the power to test differences in other drug use between groups was low.

Although it is not shown in table 7.2, participants who had dropped out were also asked about methadone use.. Ten reported using illicit methadone in the 3 month interview, ranging from once to seven times in the last month prior to interview. Only two such participants reported illicit methadone use in the 6 month interview: one used nine times, while another used daily in the last month prior to interview. Unfortunately, there was no information about the source of the illicit methadone.

Table 7.2 Days of drug use in the last 30 days prior to each review

Mean; ± SD	Baseline		3 months		6 months	
	Continuing in MMT	Dropouts	Continuing in MMT	Dropouts	Continuing in MMT	Dropouts
Heroin	23.2; ±8.4	22.4 ; ±8.9	0.3; ±1.1	4.9; ±9.4	0.9; ± 3.8	3.4; ± 8.5
	NA		RR = 1.3 (95% CI 1.1 to 1.58)		RR = 1.1(95% CI 1 to 1.32)	
	F = 0.53, df=1, p = 0.817		F = 29.158, df=1, p < 0.001		F = 7.579, df=1, p = 0.007	
	Overall differences among groups: F (3,174) = 9.713 (p < 0.001)					
Alcohol	2.9; ±7.5	1.5; ±5.1	1.5; ±4.3	1.8; ±5.0	1.3; ±4.0	1.3; ±4.9
	RR = 0.9(95% CI 0.8 to 1.1)		RR = 1 (95% CI 0.8 to 1.3)		RR = 1 (95% CI 0.8 to 1.2)	
	F=1.483, df = 1, p = 0.225		F=0.108, df=1, p = 0.743		F=0.002, df=1, p=0.961	
Other opiates	0.5; ±3.1	2.5; ±7.9	0; ± 0.3	0.2; ±0.1	0; ± 0.2	0.2; ±2.1
	RR = 1.1 (95% CI 1 to 1.2)		RR = 1 (95% CI 1 to 1.1)		RR = 1.01 (95% CI 1 to 1.1)	
	F=5.978, df=1, p=0.015		F=0.014, df=1, p=0.907		F=2.143, df=1, p=0.145	
Sedative	1.1; ±4.8	2.5; ±7.7	0.5; ±2	0.4 ±2.1	0.3; ±1.4	0.1; ±0.5
	RR = 1 (95% CI 1 to 1.1)		RR = 0.9 (95% CI 0.9 to 1)		RR = 0.9 (95% CI 0.9 to 1)	
	F=2.367, df=1, p=0.126		F=0.068, df=1, p=0.794		F=1.202, df=1, p=0.274	
Cannabis	1.9; ±6.1	0.7; ±4.2	1.2; ±4.2	1.6; ±6.1	1.0; ±4.0	0.4; ±1.4
	RR = 0.92 (95% CI 0.8 to 1.0)		R = 0.9 (95% CI 08 to 1.0)		RR = 0.9 (95% CI 0.8 to 1.0)	
	F=1.597, df=1, p=0.208		F=0.299, df=1, p=0.585		F=1.139, df=1, p=0.287	

7.3. Criminal Behaviour

Another potential benefit of remaining in an MMT program is a reduction in reported criminal involvement. It should be noted that only 29.8 percent of the total participants were involved in a criminal activity within thirty days prior to joining MMT, with the mean number of criminal behaviours being 0.82 (± 1.7) (see page 102). Thus, it was not surprising that most participants, whether or not they continued in the program, showed similar levels of criminal involvement to that of the baseline case. The median value for criminal episodes at both 3 and 6 months of follow-up was 0. The power to test for differences was relatively low. The MANOVA test showed that the differences between groups for crime status at three different data collection times were not statistically significant (see table 7.3).

Table 7.3 Number of Criminal Involvement at the 30 days prior to each review (imputed data)

Mean \pm SD	Baseline		3 months		6 months	
	Continuing in MMT	Dropouts	Continuing in MMT	Dropouts	Continuing in MMT	Dropouts
Number of Self-reported Criminal Behaviours	0.8; ± 1.8	0.7; ± 1.4	0.4; ± 1.1	0.3; ± 0.8	0.3; ± 1.0	0.1; ± 0.7
	RR = 1 (95% CI 0.8 to 1.3)		RR = 1 (95% CI 0.9 to 1.1)		RR = 1 (95% CI 0.9 to 1.1)	
	F=0.180, df=1, p=0.672		F=1.165, df=1, p=0.282		F=0.145, df=1, p=0.703	

7.4. Physical Health Status

Physical health status is also an important outcome of interest of treatment retention. Both participants who later remained in the program and those dropped out from the program had similar physical status at intake. This study showed that the differences in physical complaints *between* groups were not significant at 3 months of follow-up, but the differences *within* groups across different follow-up times were significant (table 7.4). The relative risk of not having physical complaints was higher

among people who remained in program at 6-month follow-up. Nevertheless this situation may be anomalous, as the missing data were imputed by last value carried forward (LVCF). Thus, the dropped out participants who were lost to follow-up were assumed to have a similar value as they had while still in treatment, and this may have underestimated the number of physical complaints actually present.

Table 7.4 Physical Health Status at the 30 days prior to each review (Opiate Treatment Index) (imputed data)

Mean \pm range	Baseline		3 rd month		6 th month	
	Continuing in MMT	Dropouts	Continuing in MMT	Dropouts	Continuing in MMT	Dropouts
Mean Number of physical symptoms	17.7; \pm 8.7	18.7; \pm 7.2	10.3; \pm 8.4	11.6; \pm 7.83	9.9; \pm 8	8.2; \pm 8.7
	NA		RR=2.1 (95% CI 0.8 to 5.8)		RR=0.4 (95% CI 0.4 to 0.7)	
	F=0.558, df=1, p=0.456		F=0.934, df=1, p=0.335		F=1.802, df=1, p=0.181	

7.5. Psychological Functioning Status

Previous studies also showed a remarkable improvement in psychological status, particularly **depression** status, among methadone recipients who remained in program (Lawrison et al., 2008; Utami et al., 2005). This study confirmed previous results, where participants who remained in program (within the group) showed significant reduction of that status in 3-month follow-up ($z = -1.935$, $p = 0.053$) and in 6-month follow-up ($z = -2.745$, $p = 0.006$). However, the differences in depression status between participants who remained in treatment and who dropped out from treatment at both follow-up times were not significant ($F=0.471$, $p 0.238$) (table 7.5).

For other psychological status, there were no statistical differences between groups for self-esteem and anxiety status at both follow-up times. People who remained in the program showed significantly higher self-efficacy status than people who dropped out from treatment at the 6 month follow up time ($F = 4.378$; $p = 0.038$). Comparison of self-efficacy status within people at that group also showed significant improvement in

3-month follow-up ($z = -3.438, p = 0.001$) and in 6-month follow-up ($z = -3.518, p < 0.001$).

Table 7.5 Descriptive Statistics of Psychological Functioning Scale Scores at the 30 days prior to each review (imputed data)

Mean; range	Baseline		3 rd month		6 th month	
	Continuing in MMT	Dropouts	Continuing in MMT	Dropouts	Continuing in MMT	Dropouts
Depression	29.0; ± 7.6	28.3; ± 7.2	27.3; ± 7.4	28.9; ± 7.7	27.5; ± 8.1	29.7; ± 6.9
	RR= 1(95% CI 0.6 to1.5)		RR=1.4 (95% CI 1 to 2.1)		RR=1.5 (95% CI 1 to 2.2)	
	F=0.223, df= 1, p = 0.638		F=1.669, df=1, p=0.198		F=2.756, df=1, p=0.099	
	Overall differences among groups: F (3, 174) = 0.471, p = 0.238					
Self-esteem	31.4; ± 4.8	31.8; ± 5.5	33.1; ± 5.1	31.5; ± 5.7	32.8; ± 4.9	31.5; ± 5.3
	RR=1.2 (95% CI 0.8 to 1.9)		RR=0.8 (95% CI 0.5 to 1.1)		RR=0.8 (95% CI 0.5 to 1.1)	
	F=0.238; df=1; p 0.626		F=3.685; df=1; p 0.057		F=2.550, df=1, p 0.112	
Anxiety	30.3; ± 7.0	30.9; ± 5.8	28.7; ± 6.2	30.2; ± 6.5	29.1; ± 7	30.7; ± 6.2
	RR= 1.2 (95% CI 0.7 to 1.9)		RR=1,2 (95% CI 0.8 to 1.7)		RR=1.6 (95% CI 1 to 2.5)	
	F=0.283; df=1; p 0.595		F=2.244; df=1, p 0.136		F=2.193; df=1, p 0.140	
Self Efficacy	32.1; ± 4.9	33.2; ± 4.7	35.0; ± 5.5	33.2; ± 5.6	34.9; ± 5.9	32.9; ± 5.0
	RR=1.3 (95% CI 0.9 to 1.9)		RR=0.7 (95% CI 0.4 to 1)		RR=1.1 (95% CI 0.7 to 1.7)	
	F=2.069; df=1, p 0.152		F=3.216, df=1, p 0.075		F=4.378; df=1, p=0.038	

7.7. Summary and Conclusion

Follow-up rates of the participants who remained in program were above 83 percent, while follow-up rates for the dropouts were 75.8 percent at 3-month follow-up and 51.6 percent at 6-months. Missing data were treated by an imputation method (Last value carried forward, LVCF) to minimize potential bias in analyzing the follow-up data. Data showed that participants who later remained in the program and those who later dropped out from the program had relatively similar backgrounds with respect to illicit drug use (with the exception of other opiate use), crime status, health status and psychological functioning at the last 30 days before intake. These results suggest that the groups were comparable at baseline and the selective bias was minimal.

Compared to people who dropped out from the program, those who remained in treatment reported significantly reduced illicit heroin use at follow-up interview at both 3 and 6 months. Remaining in the program was not associated with differences in other illicit drug use.

This study did not find any differences in crime and physical health status between groups at follow-up times. With regards to psychological functioning status, those who remained in treatment had higher self-efficacy at 6 months of follow up than those who dropped out from the program. The improvement of self-efficacy among the participants who remained in treatment was significant over the period of time. Concerning depression status, comparison between groups at follow-up times did not show significant difference, while comparison within groups showed significant reduction.

The secondary hypothesis of this study, that predicted significant reduction of participants' risky behaviour and improvement of participants' physical health and perception of their psychological functioning status if they remained in MMT compared to the dropouts, was only partially confirmed. Heroin Use for both follow-up times and Self-efficacy status at 6-month follow-up were both improved in those who remained in the program.

Chapter 8

Summary and Discussion

8.1. Summary and Conclusion

About half of heroin users worldwide, estimated at between 5.5 to 7.4 million, come from the Asian region, including Indonesia, and most of them are injecting drug users (IDU) (UNODC, 2009). A dramatic increase in HIV transmission through IDU in Indonesia has been recorded over the past ten years. One strategy to overcome drug-related problems is through substitution maintenance therapy such as methadone maintenance treatment (MMT). Changing from an abstinence to a maintenance orientation is a big challenge for a country with strong religious views like Indonesia. Studying any factors that support the effectiveness of MMT in changing IDU behaviour in the Indonesian context is crucial, not only for the Indonesian but also for the international community. The results of the Indonesian study may provide useful information for other countries with similar political and religious views.

A MMT program has been running in Indonesia since 2003. Although the program had attracted many IDU into treatment, the drop-out rate, particularly in Jakarta, was relatively high. Considering that remaining in treatment for an adequate period of time is critical to achieve significant behavioural change, this study aimed to examine treatment retention and its predictive variables. The main hypothesis of the study was that the primary predictors of treatment retention of MMT in Indonesia were program characteristics through dosing and take-home dose (THD) practice, followed by family support and treatment satisfaction. The secondary hypothesis was that remaining in treatment for three to six months would reduce participants' risky behaviour, and improve participants' physical health and psychological status.

The study investigated all three clinics providing MMT at the time of commencement of the study. Two were hospital-based experienced clinics: Rumah Sakit Ketergantungan Obat (RSKO) Jakarta and Rumah Sakit Sanglah (Sanglah) Bali and one was a new primary-health-care (PHC) based clinic: Tanjung Priok, Jakarta. Data for this study were collected at two levels: the clinic and the client level. At the client level, the study design was a six-month prospective cohort study, while at the clinic level, the study design was a cross sectional study.

At the clinic level, data were collected from 27 clinic staff of the three participating clinics. At the client level, this study recruited 178 participants from 232 potential participants, representing a 77 percent recruitment rate. The number of study participants in RSKO, Tanjung Priok, and Sanglah were 79, 81, and 16, respectively. The data collection period was from July 2006 to January 2008. One participant withdrew from the study due to time constraints. None of the study participants were terminated from the study. Data was collected using a structured interview and self-report.

The ratio of male to female participants was 9:1. Most of the study participants were IDU, new to MMT and joined MMT voluntarily, without any external pressure. The average duration of heroin use was 7.2 years and the median daily frequency of use was 2.6 times per day. Some participants (around 40 percent) had multiple previous treatment episodes (ranging from 2 to 20 episodes) before joining MMT, including detoxification, spiritual-based rehabilitation and therapeutic-community-based rehabilitation. About 37 percent of these participants had a prior incarceration experience and only 12.9 percent did not have any prior drug treatment or incarceration experience. The age group of 25 to 29 years accounted for the majority of participants (46.4 percent). Most were unmarried, male, Muslim, unemployed and high school graduates. Around 33 percent of them were poly-drug users (including alcohol).

The majority of study participants displayed high levels of motivation in joining MMT. Most had high awareness that they needed help regarding their drug use behaviour. A comparison of the participants' psychological status with a US study (Simpson, 2004; Joe et al., 2002) found that the Indonesian participants had lower self-esteem, higher levels of depression and lower self-efficacy, but relatively similar levels of anxiety and decision making capability. Comparison of treatment engagement found the Indonesian participants had a higher level of treatment satisfaction but lower levels of counselling and treatment participation than their American counterparts. In general, participants had high levels of confidence in the effectiveness of MMT in helping their addiction problems.

This study found that physical distance was not a core problem for the participants in accessing MMT clinics. Regardless of home address, most said they had no problem with the travel time to reach the clinic or with the mode of transportation. About 40 percent of them spent about 15 to 30 minutes daily in travel to the clinic and about 50 percent drove a motorcycle. More than one third of study participants experienced financial constraints accessing the program, particularly participants from the Tanjung Priok clinic, yet they remained in the program.

This study found that, for most participants, the family of study participants was their main supporter, both financially and psychologically. About half of study participants received financial support from their family, particularly if they lived with the family (parents or spouse). Although most perceived their family as supportive, only one third of the participants had family members who regularly visited the clinics, classified as actual family support, to enable the participants to receive THD and/or to participate in the counselling process. The proportion of the participants who received actual family support in RSKO was significantly greater than those in Tanjung Priok or Sanglah. On average, the family support for RSKO participants was four times greater

than for Tanjung Priok participants and fourteen times greater than for Sanglah participants.

The average 3-month treatment retention rate was 74.2 percent. Clinic retention rates for RSKO, Tanjung Priok, and Sanglah were 79.8 percent, 67.7 percent and 81.3 percent, respectively. The average 6-month retention rate was 61.3 percent. Based on the clinic setting, the retention rates for RSKO, Tanjung Priok and Sanglah were 62.3 percent, 57.9 percent and 75 percent, respectively. The difference in retention rates between the three clinics was not statistically significant.

The study assessed three domains of potential MMT retention predictors: Program Characteristics, Client Characteristics and Social Characteristics. Each domain was initially analysed independently and then they were compiled in a final analysis of Overall Characteristics. Potential predictors of program characteristics were Clinic Setting, Experience of the Clinic, Clinic Orientation, Dose and Take-home Doses. Potential predictors of client characteristics were Age, Lifetime Heroin Use, Imprisonment History, Physical Health, Crime Status, Perceived Treatment Accessibility, Treatment Motivation, Psychological Status, Social Status, Treatment Engagement and subjective feelings of Methadone's Sufficiency. Potential predictors of social characteristics were the Frequency of Family Attendance on the Clinic (called Actual Family Support), the Clients' Perception of Family Support, the Clients' Perception of Peer Support and the Clients' Perception of Social Support.

Analysis of program characteristics found that dose and take-home dose (THD) privileges were significant predictors of retention. People with a higher dose (>60 mg) and more frequent THD remained in treatment longer than those who received low doses (\leq 60 mg) and less frequent THD. The clinic setting in this study did not act as a potential predictor of treatment retention, meaning that neither setting, primary-care units or hospitals, had an effect on the retention rate. These results supported previous

findings (Gossop et al., 1999; Fiellin et al., 2001; Gossop et al., 2003; Amy et al., 2003; Wittchen et al., 2008). Experience of the clinic was also not significant in predicting treatment retention but was included in further analysis, because empirical observation showed that having adequate clinical experience for the clinic staff is essential for a better service.

Analysis based on the model of client characteristics found that age, imprisonment, self-efficacy and the interaction between lifetime heroin use and the perceived treatment accessibility were significant treatment retention predictors. The participants who were older, had a prior history of imprisonment and had better self-efficacy, were more likely to remain in treatment. The interaction between duration of heroin use and perception of treatment accessibility also predicted longer treatment retention.

Analysis based on the model of social characteristics did not yield any significant predictors of treatment retention. However, actual family support and perceived peer support were included in the final analysis of the overall characteristics, as these variables may be relevant in the Indonesian context.

The final analysis of overall characteristics included all the above variables as well as variables which were not found to be significant in the domain model but had a p-value of 0.25 or less, to prevent an early exclusion of potential variables in order to have a more comprehensive final model (UCLA, 2008). The final model found that predictors of treatment retention of MMT in Indonesia were:

- Dose
- The Interaction between THD and clinic experience
- Age
- Participant's belief towards program
- Perceived accessibility

- Perceived peer support

The final model showed that some variables which were not significant in the domain model such as participant's belief towards programs and perceived peer support were significant in the comprehensive model.

In interpreting the final model, the first five predictive variables (dose, interaction between THD and clinic experience, age, participant's belief towards program, and perceived accessibility) increased the likelihood of remaining in treatment, while perceived peer support decreased the likelihood of remaining in treatment. High dose (≥ 60 mg/day) and frequent THD prescribed in an experienced clinic retained people in treatment longer. Older clients, stronger belief in the program and higher perceived accessibility also predicted retention in treatment, while, interestingly, stronger positive peer support predicted leaving treatment earlier.

The strongest predictors were dose, followed by the interaction between THD and experience of the clinic. The dose contributed 50 percent to treatment retention, while the interaction between THD and experience of the clinic contributed between 9 percent and 41 percent, depending on frequency of THD prescription and level of the experience of the clinic. Other variables contributed to treatment retention, ranged from 4 percent to about 10 percent. Therefore, the study results supported the primary hypothesis that the program characteristics through dose and the interaction between THD and experience were the primary predictors of treatment retention in Indonesia. Nevertheless, this study did not support the variables of family support and treatment satisfaction as the secondary predictors of treatment retention.

Missed doses during the study period ranged from 1.9 percent in Bali to 7.2 percent in Jakarta. This small percentage of missed doses reflected a high commitment of the clients to the treatment program as shown by previous study (Ball and Ross, 1991). The implementation of THD, particularly in the Jakarta clinics (RSKO and

Tanjung Priok), did not strictly follow the National Guidelines, which requires someone to be in the program for at least two months prior to having THD privileges. It was also found that about 50 percent of THD prescriptions were made available to clients who had not met the guideline requirement. RSKO, Tanjung Priok and Sanglah released THD for 21.8 percent, 10.5 percent and 6.1 percent, respectively. The differences of THD proportion among clinics were significant, with RSKO being the clinic that released THD most frequently. However, the proportion of clients receiving THD in RSKO was considered comparable with a previous study that identified 23 percent of all doses as THD (Ball and Ross, 1991).

The average maximum dose over the study period in the three participating clinics was 76.9 mg per day. This average dose had followed the National Guidelines which suggested dose between 60 to 120 mg as a maintenance dose. Average doses at baseline, 3-month follow-up and 6-month follow-up (mean 47.2, 76.0 and 77.2 mg, respectively) in general were perceived by study participants to be sufficient to overcome withdrawal symptoms and heroin craving. Side effects were perceived as minimal, with the commonest reports being sleeping disturbances (15.7 percent) and constipation (14 percent). About one third of the participants had no adverse effects while in the program.

Follow-up rates at the 3rd month and 6th month were 86.2% and 83.6% for the participants continuing in the program and 75.8% and 51.6% for the dropouts. To minimize bias in interpreting the results, an imputation method for missing data was implemented, using the last value carried forward (LVCF) approach.

As found in previous studies (Ball and Ross, 1991; Lowinson et al., 1997; Joseh et al., 2000; Preston et al., 2000; Mattick et al., 2003) this study showed a marked reduction in heroin use at both follow-up times for people remaining in treatment. This was significantly lower than the rate of heroin use in the people who had dropped out .

Thus, methadone maintenance treatment showed its effectiveness in preventing heroin use among participants as long as they were still in treatment, confirming results from other countries.. Nevertheless, this study did not find any significant differences in criminal involvement and physical health status between groups at both follow-up times. Depression status reduced significantly among those who remained in treatment, however if we looked at the differences between groups of that in both follow-up times were not significant. In addition, people who remained in the program had significant improvement of their self-efficacy and compared to those who dropped out from program, they showed higher self-efficacy status at the 6 month follow-up.

8.2.Study Limitations

There were four major limitations to this study. First, there was a risk of bias in assessment of outcomes which is common in observational or cohort studies (Gordis, 2000). Because this study was observational and not a randomized clinical trial (RCT), the risk may relate to the “unequal” participants” characteristics between participants who remained in treatment and those who dropped out of treatment. Participants with better outcomes are more likely to remain in treatment (Hall et al., 1998), thus, the inferences about treatment effectiveness cannot be firmly established. However, this comparison group design can “successfully” evaluate treatment outcome if the two groups are similar at the beginning of the evaluation (WHO, 2000). This study showed that relevant characteristics such as marital status, employment status, history of drug dependence, history of drug treatment and some other psychological functions were similar between the continuing participants and the dropouts. So, these similarities imply only a small possibility of selection bias, but cannot exclude differences in degree of motivation to continue.

Second, as a cohort study, there was also a possibility of bias due to loss to follow-up, particularly for the dropout participants, which can complicate the interpretation of study findings (Gordis, 2000). Some of these participants were lost to follow up, mostly due to reasons of moving out of town, or becoming incarcerated. The follow-up rates of the continuing participants at the 3rd-month and 6th-month reviews were 86.2 percent and 83.6 percent, respectively, while the follow-up rates of the dropout participants at both reviews were 75.8 percent and 51.6 percent. The follow-up rate for participants who remained in program at both reviews and for participants who dropped out at the 3-month review met the minimum standard of outcome evaluation which required at least a 70 percent follow-up rate for a reasonable comparative reason (McLellan et al., 1996), while the follow-up rate for the dropouts at 6-month review did not meet the minimum standard of outcome evaluation. Efforts were made to overcome missing data by implementing an imputation method, however, results may not be generalized as the missing cases may had different characteristics than that of participants who were successfully reviewed in the follow-up times.

Third, there were potential biases relating to sensitive questions, such as drug use and criminal involvement. The study participants might try to „look good“ as they were aware of the objective of the study (Hawthorne effect), and thus alter their responses. Thus, the quality of the data may not be adequate, specifically for illicit heroin use since the study relied on self-report. Efforts were made to minimize this bias by using independent interviewers to collect the data and reminding participants that their answers would have no influence over their treatment. This should have allowed more freedom for the study participants in reporting drug use accurately (Digiusto, et al., 1996).

Finally, as in other field studies, this study faced an emerging issue during the data collection period that may have affected the study. There was potential bias related

to the establishment of four further PHC-based methadone clinics in Jakarta. Previous studies have shown that scaling-up MMT can affect client characteristics, such as having multiple entry into treatment (Brands et al, 2001; Bell et al, 2005). Knowing that programs are widely available may influence a participant's resolve to stay in the program. Consequently, the retention rates that were found in this study might also have been affected by this scaling-up program.

8.3.Discussion

This study found the 3-month MMT retention rate in Indonesia was 74.2 percent and the 6-month retention rate was 61.3 percent. These rates are comparable with those of previous western-based studies (Booth et al, 2004; Bell et al., 2002; Coviello et al., 2004). Among all predictive variables in this study, dose was the most influential factor affecting treatment retention. Doses of more than 60 mg/day were significantly more likely to retain people in MMT, supporting the results of similar studies (Newman and Whitehill, 1979; Caplehorn and Bell, 1991; Joe et al., 1991; Saxon et al., 1996; Joseph et al., 2000; Hiltunen and Eklund 2002; Booth et al., 2004).

The second most influential predictive factor of treatment retention was the interaction between THD policy and the clinic experience. Although providing more frequent THD in general was associated with better retention rates (Grabowsky et al., 1993), the experience level of the clinic in methadone treatment, worked as a moderator for THD (Baron & Kenny, 1986): it influenced the strength of the THD effect on treatment retention. THD in the experienced clinics (RSKO and Sanglah) reduced the likelihood of drop out approximately four fold compared to that in the new-existing clinic (Tanjung Priok). The way experienced staff treat methadone clients –particularly in assessing suitability for THD- might be more accurate than their colleagues in the new clinic. Sufficient exposure to treating methadone clients increases the sensitivity of

clinic staff in assessing clients' characteristics and needs. Bell (1998) found that if staff believe in the treatment they deliver, the treatment outcomes were better. Sufficient hands-on experience increases staff's confidence in prescribing THD and boosts treatment retention.

This study found that THD seemed more important for the Jakarta participants, particularly the RSKO participants, than for the Bali participants. The Jakarta participants had greater transportation and travel time problems than their peer in Bali. Compared to Bali, many participants in Jakarta come from other subdistricts of Jakarta and its vicinity areas (see Figure 4.1 and 4.3). Traffic congestion in Jakarta is also more problematic than in Bali. During the weekdays and the peak hours, often one needs more than half an hour to drive a distance of 5 kilometres. Public transportation is considered poor (Sutiyoso, 2007). Only 23.6 percent of the Jakarta participants used public transportation to access the clinic. Thus, prescribing THD for participants who faced transportation and traffic problems increased the likelihood of them remaining in treatment, as suggested by Pani and Pirastu (2000).

All clinic coordinators perceived prescribing THD as the most challenging task. National Guidelines discourages regular THD except for the emergency situations. The Guidelines also emphasises the importance of family's attendance in influencing the decision to allow THD. In some cases, those two essential requirements could not be met. What was perceived by the client as an "emergency situation" may not truly be an emergency from the clinic staff's perspective. Often, clinical judgement of the appropriateness of THD invites conflicts between client and clinic staff. RSKO seemed the most permissive clinic in prescribing THD. This permissiveness was reflected by allowing 33.3 percent of their participants to receive THD before two months in the program. As RSKO is a technical supervisor of Tanjung Priok clinic, this tolerant attitude in prescribing THD is also transferred to the satellites. The proportion of

Tanjung Priok participants who received THD before completing two months in the program was also high (25.4 percent), while none of the Sanglah participants received THD before two months in the program.

Although the availability of THD appears crucial to retaining people in treatment, it also increases the possibility of THD diversion into black market (Darke et al., 1996a; Pani et al., 1996). During the study period there were some indication that the diversion of THD was occurring. The first indicator was derived from participants who reported in the follow-up interviews (see page 99) that they had access to methadone illegally, particularly from diverted THD. The second indicator was based on reports from the Jakarta clinics of two incidents of patients selling THD to other treatment clients who came late to the clinic and could not receive their dose. Furthermore, clinic staff recently reported that THD diversions have increased. These THD were sold cheaply to active IDU who had not yet joined MMT and had difficulty accessing illicit heroin (RSKO methadone client, personal comm., November 17, 2008).

Previous studies have found that staff orientation can affect treatment implementation, particularly dosing policy (Bell et al., 1995, Caplehorn et al., 1998). This study found that compared to the American clinic staff (Kang, et al., 1997), the Indonesian staff attitudes were slightly more client oriented, although the differences were not statistically significant. They were less strict about methadone policies and were more maintenance orientated. This situation probably is influenced by the history that the initial establishment of MMT in Indonesia was part of a harm reduction program, as a response to the emerging problem of HIV transmission among IDU.

This study also found age to be a significant predictor of treatment retention, supporting the results of previous western-based studies (Sorensen et al., 1985; Saxon et al., 1996; Friedmann et al., 2001; Hser et al., 2004; Deck and Carlson, 2005). The older clients in this study tended to start using drugs at an earlier age, thus, a plausible

explanation of why older age predicts longer retention is the possibility of “maturing-out” where they feel tired of their addictive habits (Deck and Carlson, 2005).

Similar to the finding of a previous study (Hiltunen and Eklund, 2002), this study also found participant’s beliefs in the program were a significant predictor of treatment retention. This variable had greater influence at the individual level than at the clinic level. Interestingly, “treatment process constructs” such as treatment satisfaction and counselling rapport which have been found previously to be more important than beliefs towards program (Simpson et al., 1997; Joe et al., 1999) were not found to be significant predictors in this study. Most likely, the level of “treatment process constructs” of those who remained in the program as well as those who dropped out was already high at the beginning of the program. Hence, there may have been a ceiling effect.

Another significant predictor of retention was the perception of treatment accessibility. This study found that participants’ perception of their capability to access the program was more important than their actual capability. Their perception seemed to help them overcoming distance, transportation, time and financial barriers. Once they believed in the program benefits, some efforts would be made to overcome barriers. One example of these efforts was evidence that some participants who had financial problems asked for support from their peers in the methadone program (RSKO methadone client, personal comm., September 15, 2007). Another example was that participants who had transportation or distance barriers preferred to ask for more frequent THD (RSKO methadone client, personal comm., September 15, 2007).

An unexpected finding was that a 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 support from peers reduced treatment retention, this study found that the more the positive support of their peers, the greater the

likelihood of participants dropping out of treatment. However, it should be noted that this effect was only noted at baseline. Thus, at entry, participants who had more supportive peers outside the methadone program were more likely to leave treatment prematurely.

There are three plausible explanations of this observation. Firstly, there is a „plausible rival explanation„(Hall et al., 1998), a condition in which those who remained in treatment had a stronger motivation to join the program and coincidentally had less need for supportive peers than those who dropped out. Secondly, people who think they have more options in changing their addictive behaviours may be more confident to leave treatment. So, the perception of having more supportive peers allows them to explore other alternatives to change their behaviours besides remaining in the program. Thirdly, people who perceive their MMT peers as “less supportive” than their other peers may prefer to leave the program earlier.

A negative aspect of the MMT program was the evidence that participants tended to loiter around the clinic after dosing. Often, this “triggers” people to use other drugs, as reported by a dropped out participant (SY, personal comm., 26 November 2007). Loitering after dosing may be an indicator of drug dealing (Glezen and Lowery, 1999), which can have a negative impact on treatment outcome, including treatment retention. Therefore, clear and firm clinic requirements, including prohibition of loitering, should be regularly drawn to clients’ attention, not only at intake but also during treatment.

The clinics demonstrated varied approaches to the control of continued illicit drug use. The clinic policies did not provide any negative sanctions for continued illicit drug use during treatment, except for suspending THD privilege until the client could demonstrate no further drug use through urinalysis. Nevertheless, suspending THD due to clients’ secondary drug use was not a simple matter. Often, clients insisted they were not using other drugs although urinalysis and behavioural signs confirmed they were

taking drugs. At RSKO and Sanglah, a decision to suspend THD was made and enforced by the team, as these clinics had adequate working hours and number of staff to cope with increased client's attendance. For Tanjung Priok, due to limited time of service and number of staff, they preferred to "ignore" the indicative behaviour of continued drug use.

Another emerging issue was the relaxation of requirements for entry into treatment. In the National Guidelines, clients are required to be eighteen years of age or above, have at least one year history of heroin use and a prior attempt to quit heroin. In fact, RSKO only required a six-month history of heroin use without any prior attempt to stop using heroin. Sanglah allowed entry after less than a one year history of heroin use and also did not require previous treatment. Tanjung Priok, due to high demand, prioritized those with a history of more than a year's heroin use and at least one attempt at quitting. The rationale to be more *permissive* for new admissions was based on the consideration that in order to minimize HIV transmission among IDU, "*the sooner the IDU join MMT, the better the outcome*" (Asril, personal comm., July 2006). This permissiveness had the beneficial effect of allowing more IDU into the program, to increase the possibility of preventing HIV transmission (Ward et al., 1998), but on the other hand, low threshold programs do not guarantee favourable behavioural change and might also increase the possibility of methadone diversion to untreated IDU (Fugelstad et al., 2007).

This study found that staff welfare was not prioritized within the clinics, particularly for the clinic staff of Tanjung Priok who had excessive workloads. Bell (1998) pointed out that working in the area of drug treatment, particularly with heroin users, is stressful. Although research addressing this issue is scarce and the prevalence of staff burn out in this area is unknown, NIDA estimated that 20-30 percent of the annual turnover of drug treatment workers may be partly due to "burn out"

(Lacoursiere, 2001). Bell (1998) predicted that burn-out may also be a potential factor that reduces treatment effectiveness.

Finally, efforts to minimize the loss to follow-up for the dropout participants, particularly in the 6-month follow-up, were suboptimal. Previous studies also found that following-up drug users in a longitudinal study was a challenging task (Cottler et al., 1996; Boys et al., 2003) and the highest proportion of follow-up happened in the first 6 months (Boys et al., 2003). Strategies were made to minimize the loss to follow-up including locator forms at baseline and at three-month follow-up, incentives and compensation for time spent, phone calls prior to follow-up interviews and home visits. Nevertheless, the success rate was low, particularly in tracing dropouts from Tanjung Priok.

There were some common reasons for failure. This included hard-to-reach addresses. Some participants could not provide addresses and phone number at baseline as they lived in a slum area. A second reason was the impact of non-supportive family members. Participants in this group usually did not inform their family of their participation in the methadone program. Many of these families did not even know that their family member was a drug user. Thus, when home visits or phone calls were made, the family refused to let the interviewer talk to the participant. Thirdly, some failures occurred due to the limited time of the data collector. Cottler et al (1996) suggested that a longitudinal study needs to have an interviewer team who are enthusiastic, persistent and have sufficient time to successfully trace back participants. Two of the data collectors in this study had time constraints in following-up dropout participants. They were both female and had family responsibilities. Substituting their roles to other interviewers was not a simple matter, particularly from the participants' perspective.

8.4. Study Implications

8.4.1. For Treatment Policy and Regulation

The study provides four substantial implications for treatment policy and regulation. First, the study suggests that apart from the National Guidelines, all MMT clinic staff need standard operating procedures for take-home dose prescription. This standard should contain inclusion criteria of clients who are eligible for THD, an operational definition of what constitutes an „emergency situation“ that may lead to THD, and practical rules for prescribing THD. The development of this standard should consider issues related to the local context, such as geographical differences, community demands and the diversity of client characteristics. It is expected that this standard will help clinic staff in making more appropriate clinical judgments when faced with ambiguous situations related to THD requests.

Second, the present research suggests that the national training module for clinic staff should include management and clinical practices of MMT, management of substance related disorders and on the job training. Sufficient understanding of treating drug users is essential for the staff in establishing a suitable treatment plan for each client, while hands-on technical assistance will assist new staff in gaining self confidence and practical skills in providing methadone treatment.

Third, this study has found that the perception of clients of the accessibility of the program was more important than the actual capability. However, about one third of the study participants admitted they faced financial constraints in accessing program, not only related to transportation to visit the clinics, but also to pay for the provision of methadone (see page 11). Although a few could get support from their peers, this situation may not be sustainable in the longer term and in turn, will affect treatment retention. Thus this study also suggests that sustainable government“s subsidy for drug treatment modalities should be seriously considered. So far, the allocation from the

government's budget towards drug abuse is mainly focused on the supply reduction programs (law enforcement strategies), followed by the prevention program (mainly through seminars). Budget allocation for treatment and rehabilitation programs is limited even though the number of drug users who need treatment has been increasing. Providing a secure subsidy or health insurance would increase treatment seeking and retention rate (Wu et al., 2003; Galvin et al., 2007) and in turn, will contribute to the benefit of the community.

Fourth, the results from this study confirmed the initial research into methadone treatment (Dole and Nyswander, 1965) and the Cochrane review (Amato et al, 2004) that MMT cannot solely rely on the pharmacological process, but should also offer other psychosocial intervention. For the clinics without sufficient number of staff and limited service hours such as the PHC-based clinic, it is a big challenge to provide clients with other psychosocial services. Thus, policies and regulations in scaling up program should not only consider treatment demand but also the availability of sufficient trained staff and operational hours, to achieve better treatment performance. The availability of these two components will benefit clients as well as clinic staff. The possibility of clients receiving appropriate counselling which not only addresses their methadone treatment but also addiction issues will be greater. Staff will also benefit as their workload will not be excessive, thus reducing the likelihood of them experiencing burn-out as well as other negative behaviours.

8.4.2. For Clinic Implementation

There are four practical suggestions for the clinic implementation. First, the research suggests that information and review of the clinics' rules and regulations for the clients must be undertaken regularly; so that the clients understand the consistency of the clinic in keeping the regulations and those regulations are made for the client's

greater interests. Information or review can be made through counselling sessions, health educations and support group meetings.

Second, the Indonesian clients had greater problems with self-esteem and depression compared to their counterparts in the US. This study suggests that a comprehensive individual treatment plan should be well developed with special attention to addressing lower psychological status. Clinics need specialized staff with skills in counselling and psychotherapy. Clinics should also consider building networks with other institutions that can provide case management to achieve optimum behavioural change.

Third, the study found that actual family support is one potential factor for improving treatment outcome. Thus, this research suggests that clinics, as much as possible, should develop a family support group. By having this forum, families could better understand the philosophy and the regulations of MMT, the nature of drug addiction, and ways to effectively support the client. Actual involvement of the family could also help to minimize THD diversions by monitoring the usage of home-dose methadone.

Fourth, having comprehensive information about the clients will broaden clinic staff knowledge on clients' needs and characteristics. This knowledge is essential in developing each client's treatment plan. Therefore, the present study also suggests the utilization of standardized assessment instruments to reduce information variability and potential interviewer bias (Hall et al., 1998; Forman et al., 2004). Instruments like the Addiction Severity Index (McLellan et al, 1985) and the Opiate Treatment Index (Darke et al., 1991) which have been translated and adapted into Indonesian language could be also considered for implementation.

8.4.3. For Future Research

In addition to dose, this study found THD to be a strong predictor of treatment retention. However, clinic staff perceived prescribing THD was a complicated task which invites the possibility of conflict between the client and counsellor. THD also allows for possible diversion of methadone to the black market. Such situations should be the topic of further study.

The study also found positive peer support paradoxically increased the likelihood to drop out of treatment. However, it was not clear why. Further investigation is required to deepen this understanding of this issue.

Another unexpected observation which requires further study was the fact that there were no significant differences in criminal involvement, physical health status and depression status between those who remained in treatment and the treatment dropouts in both follow-up times.

Lastly, there were indications that staff at the primary-care-based clinic had an excessive workload. This study did not explore how this might influence treatment effectiveness. Further investigations that focus on staff workload and its relationship to the clinic setting and client outcomes would be a significant contribution for Indonesia in developing standards of care for opioid replacement therapy.