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AN ASSESSMENT MODEL FOR METHAMPHETAMINE DEPENDENCE TREATMENT REHABILITATION IN THAILAND

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อุษณีย์ พึ่งปาน: การประเมินรูปแบบการบำบัดฟื้นฟูสมรรถภาพการเสพติดยาบ้าในประเทศไทย (**AN ASSESSMENT MODEL FOR METHAMPHETAMINE DEPENDENCE TREATMENT REHABILITATION IN THAILAND**). อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ศาสตราจารย์ ดร. ภัสสร ลิมานนท์. อ.ที่ปรึกษาวิทยานิพนธ์ร่วม: ผู้ช่วยศาสตราจารย์ นายแพทย์ ดร.อภินันท์ อร่ามรัตน์, 130 หน้า

การศึกษานี้มีวัตถุประสงค์เพื่อหาอัตราและระยะเวลาการหยุดเสพยาบ้า ตลอดจนการพัฒนาการคนไข้ที่เข้ารับการฟื้นฟูสมรรถภาพที่นิยมใช้ในประเทศไทย 2 รูปแบบ กล่าวคือ แบบจิตสังคมบำบัด **(Matrix model)** และการบำบัดฟื้นฟูแบบเข้มข้นทางสายใหม่ **(FAST model)** ซึ่งความแตกต่างของรูปแบบการฟื้นฟูทั้ง 2 นี้คือ แบบจิตสังคมบำบัดเป็นคนไข้นอกและแบบเข้มข้นทางสายใหม่เป็นคนไข้ใน นอกจากนี้จิตสังคมบำบัดยังใช้รูปแบบการบำบัดเพื่อปรับเปลี่ยนความคิดและพฤติกรรมของคนไข้ ขณะที่แบบเข้มข้นทางสายใหม่เป็นการฟื้นฟูสมรรถภาพที่ปรับมาจากรูปแบบชุมชนบำบัด เก็บข้อมูลจากคนไข้ชายที่สมัครใจเข้าร่วมโครงการ อายุ 15-35 ปี ที่เข้ารับการบำบัดยาบ้าที่ศูนย์บำบัดรักษายาเสพติด 2 แห่งและคลินิกจิตเวชในโรงพยาบาลจังหวัดแห่งหนึ่ง รวบรวมข้อมูลเบื้องต้น ข้อมูลเปรียบเทียบการพัฒนาการในระหว่างฟื้นฟู 2 ครั้ง เมื่อเข้ารับการฟื้นฟูได้ 1.5 และ 3 เดือน และติดตามผลการบำบัดฟื้นฟูสมรรถภาพหลังจากออกจากสถานพยาบาล 1, 3 เดือนและ 6 เดือน

จำนวนตัวอย่างที่เก็บได้ 176 ราย ในจำนวนนี้ 84 รายเป็นคนไข้ฟื้นฟูด้วยแบบจิตสังคมบำบัด (คนไข้นอก) ส่วน 92 ราย ฟื้นฟูแบบเข้มข้นทางสายใหม่ (คนไข้ใน) ภายหลังการติดตามผลเมื่อครบ 6 เดือน พบ 115 ราย อัตราการหยุดเสพสารเสพติด และระยะเวลาที่อดได้เป็นจำนวนวันไม่แตกต่างกันระหว่างการฟื้นฟูแบบคนไข้นอก และคนไข้ใน แต่กลับพบว่าสถานพยาบาลมีผลต่อระยะเวลาการหยุดเสพยาได้อย่างมีนัยสำคัญ และเมื่อเปรียบเทียบผู้ที่หยุดเสพยาได้และผู้ที่หยุดเสพยาไม่ได้ ก็พบว่า ผู้ที่หยุดเสพยาบ้าได้มีพัฒนาการที่ดีกว่าผู้ที่หยุดเสพยาไม่ได้

สาขาวิชา : วิจัยเพื่อการพัฒนาสุขภาพ ลายมือชื่อนิสิต.....

ปีการศึกษา : 2552 ลายมือชื่ออ.ที่ปรึกษาวิทยานิพนธ์หลัก.....

ลายมือชื่ออ.ที่ปรึกษาวิทยานิพนธ์ร่วม.....

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KEYWORDS : METHAMPHETAMINE DEPENDENT/ TREATMENT REHABILITATION/ EVALUATION/ ASSESSMENT

USANEYA PERNGPARN: AN ASSESSMENT MODEL FOR METHAMPHETAMINE DEPENDENCE TREATMENT REHABILITATION IN THAILAND. THESIS ADVISOR: Professor Bhassorn Limanonda, Ph.D., THESIS CO-ADVISOR: Assistant Professor Apinun Aramrattana, M.D., Ph.D., 130 pp.

This study is to assess the rates and duration of abstinence and patients' improvement of two drug dependence treatment rehabilitation models, Matrix and FAST models which are widely used in Thailand. FAST and Matrix models are different in terms of in and out-patients. In addition, Matrix model is a cognitive behaviour therapy while FAST model is transformed from the Therapeutic Community model.

Two government run drug dependence treatment centres (DDTCs) and a psychiatric unit in a provincial hospital were selected. Within these treatment centres male volunteers, aged 15-35 years who reported currently using methamphetamine were randomly selected to assess their baseline data. Any improvement in the baseline was assessed twice at, 1.5 and 3 months during the rehabilitation period and in follow-ups at 1, 3 and 6 months after being discharged at 4 months.

From one hundred and seventy-six participants, 84 and 92 cases from Matrix out-patients and FAST in-patients respectively were recruited. After being discharged, 115 cases were found and interviewed after the 6 month follow-up, the rate and duration of abstinence showed no statistical difference between Matrix and FAST models. The rate of abstinence at the psychiatric unit was better than the two DDTCs. The non-relapse cases that completed the 6 month follow-up showed better improvement than the relapse cases.

Field of Study: Research for Health Development Student's Signature Usaneya Perngparn

Academic Year: 2009 Advisor's Signature Bhassorn Limanonda

Co-Advisor's Signature

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LIST OF ABBREVIATIONS

ATS	Amphetamine Type Stimulants
ACSAN	Administrative Committee of Substance Abuse Academic Network
DDTC	Drug Dependence Treatment Centre
df	Degree of freedom
Exp(B)	Exponential B
FAST	Derived Model from Therapeutic Community
IOP	Intensive Outpatient Program
MA	Methamphetamine
N	Number of sample
NA	Narcotic Anonymous
NCSWT	National Council of Social Welfare of Thailand
ONCB	Office of Narcotics Control Board
S.D.	Standard Deviation
S.E.	Standard Error
t	t-test statistic
TC	Therapeutic Community
TCU	Texas Christian University
UCLA	University of California, Los Angeles
UNFDAC	United Nations Fund for Drug Abuse Control
UNODC	United Nation on Drugs and Crimes
USA	United States of America
WHO	World Health Organization

CHAPTER I

INTRODUCTION

1.1 Background and Rationale

1.1.1) Historical Context of the Substance Abuse Epidemic in Thailand

Historical documentation in the Ancient Language Section of the National Library of Thailand 1702 indicates that opium smoking was a major national problem in the 16th century. Since then, opium use has continued to represent a national crisis recurring repeatedly until the early 20th century (Vichai Poshyachinda, 1982). In 1960, the first heroin epidemic spread countrywide after the enactment of the opium ban law in 1959. The epidemic subsided for a few years (Vichai Poshyachinda, Chitr Sitthi-amorn and Yupa Onthuam, 1978; Vichai Poshyachinda, 1980) then the second wave of the heroin epidemic appeared from the beginning of the 1970s through to the end of the 1980s (Vichai Poshyachinda *et al.*, 1988). In the early 1960s, concurrent with the heroin epidemic, a few cases of illicit stimulant indictments appeared in the law enforcement statistics. The number of illicit stimulant cases began increasing in 1970 reaching its peak in 1980, and declined quickly over the next few years. However, the use of amphetamine type stimulants (ATS), known as yaba, among truck drivers continues. Since 1995, the epidemic of ATS use has become a serious problem. (Vichai Poshyachinda *et al.*, 1999; and Vichai Poshyachinda *et al.*, 2000).

1.1.2) Current Situation

From 1990 to 2002, the number of heroin users admitted to treatment centres and of those arrested was decreasing. In contrast, the number of methamphetamine users was markedly increasing and had reached its peak in 2002. Nevertheless, the "War on Drugs 2003"* policy in Thailand has affected a reduction in the use of methamphetamine. A comparison of the 2001 and 2003 national household surveys

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* In response to the recent ATS epidemic, the government declared substance abuse problem to be a priority in February 2001 (ONCB, 2003). This new substance abuse policy is well known as 'The Power of the Land' policy. The 'War on Drugs' operation was the culmination of intensive interventions under this policy.

on drug abuse confirmed a decreasing trend of ATS use but the trend towards using club drugs and kratom (*Mitragyna speciosa*) increased (Poshyachinda *et al*., 2005). Although, data on heroin users showed minimal decreases, the sample size was too small to indicate a definite interpretation (Administrative Committee of Substance Abuse Academic Network [ACSAN], Office of the Narcotics Control Board [ONCB], 2004). What was clear in this report however was that methamphetamine was still the most prominent drug used in 2003. According to recent reports assessing the impact of injecting drug users in Chiang Mai, northern Thailand (Vongchak *et al.,* 2005), most injectors who could not obtain heroin turned to alcohol, methamphetamine and sleeping pills as substitutes. Recently the 2007 national household survey on drug abuse reported that about 2,521,500 or 5.4% of the population aged 12-65 years had ever used one substance in their lifetime. Of those, about 575,300 persons used at least one substance within the last year. The percentage of the population that used at least one substance within one the last year was higher in Bangkok and the southern region. Kratom, cannabis, methamphetamine and volatile substances were respectively ranked as popular substances used within one the last year. Kratom was used by laborers and those of working age while cannabis and methamphetamine users were occasional workers and the younger age group. In addition, the ratio of male to female was 10:1 for all country and the highest was in Bangkok, 4:1. (ACSAN, ONCB, 2007).

The extent of HIV infection among drug abusers has been appraised in relation to the rapid change of the substance abuse pattern. In Thailand, the substance dependent population, especially intravenous drug users is quite large and expanded rapidly in the 1990s. Between 1992-2001, Thanyarak Institute, the biggest Drug Dependence Treatment Centre in Thailand screened 7,097–12,084 drug dependents per year for HIV reactive serum. A trend of increased prevalence was observed in patients using methamphetamine from 1995 to a maximal percentage of about 8% in 1998. Prevalence decreased to 4 and 5% in the following years. (Wiput Phoolcharoen *et al.*, 2004: 50). According to existing reports, the level of seroprevalence of non-injecting substance abusers was fairly high, well above the general population level. In

addition, other health problems, such as high rates of sexually transmitted infection have been found among methamphetamine users (Celentano *et al*., 2007).

1.1.3) Drug Dependence Treatment policy

Since 2001 the Government policy has regarded drug dependents as patients, not criminals, by using treatment as a tool for recovery instead of prosecution. For example, the Office of the Prime Minister made a decree 119/2544 in 2001 regarding the use of people power to fight illegal drugs. Drug dependence treatment and rehabilitation became essential parts of the policy. The Narcotic Addict Rehabilitation Act 2/2545 of 2002 affected the appointment of working groups on drug dependence treatment systems and rehabilitation. In addition, the Treatment and Rehabilitation Act of 2002, entitled all to receive appropriate treatment.

In 2009, as the main mechanism for full implementation, the Government declared its national drug control policy as using a so-called "Five Defensive Fences Strategy"[*] (Prime Minister's Order No. 249/2552, 2009). All concerned public agencies have put serious effort into solving the drug problem and substantial changes can be seen. To accelerate the implementation of the drug control policy the Government has set up strategic goals and objectives to prevent the problems from becoming worse, to build a better life for all and to ensure the security of the society as a whole. The targets of reducing supply and demand have been set up. One of the demand reduction policies is to admit at least 300,000 drug abusers/addicts to suitable treatment and rehabilitation of which a half will come from community persuasion, civil society, and as self selected volunteers. (See detail in Appendix 1)

1.1.4) Drug Dependence Treatment in Thailand

The majority of treatment services during the 1960s to 1990s were designed for heroin users. The process of treatment, both in-patient and out-patient included

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[*] National drug control policy aims to eradicate demand and supply of drug consisting of 5 areas, boarder, community, social, school and family; and 4 projects, drug suppression, treatment and rehabilitation of drug addicts, drug prevention in work places and drug control management project (The Prime Minister's Office. 2009). The main idea of treatment and rehabilitation is taking drug users to suitable treatment and rehabilitation program for their social reintegration.

preparation, detoxification, rehabilitation and follow-up. Preparation stage covered registration, regulation and treatment guidance. Regarding the detoxification stage, drug treatment detoxification ranged from herbal medicine to current developments in the use of methadone. The rehabilitation stage was intended to change the patients' behaviour after they became drug free. Most rehabilitation programs in the treatment centres provided a variety of therapies, such as cognitive behaviour therapy, Matrix model, etc. The programs were provided according to the centres' facilities and dependent on appropriate application for the client. The last important stage was the follow-up after discharge. The patients were required to report their progress such as abstinence, health problems and social assimilation.

Since 1997, however, there has been a large increase in those seeking help for yaba or methamphetamine use. The treatment system has changed to serve the methamphetamine dependents by adopting a Matrix model to treat drug dependents, especially methamphetamine users. The Matrix model was originally developed in response to the cocaine epidemic of the 1980s in UCLA, USA (Obert *et al.*, 2000). The program is mainly in the rehabilitation phase rather than in the detoxification phase. At the beginning, six treatment centres, i.e. Thanyarak Institute, Chiang Mai Drug Dependence Treatment Centre (DDTC), Khon Kaen DDTC, Psychiatric Department of Ministry of Public Health, Suan Prung Psychiatric Hospital and Ratchaburi Provincial Hospital have been trained in UCLA. Because of "War on Drugs" in 2003, the Matrix model was distributed immediately to other treatment centres including provincial and community hospitals countrywide.

The rehabilitation of ex-drug user in-patients is less developed than out-patient services. In addition, only some specialized treatment centres, such as Thanyarak Institute, Drug Dependence Treatment Centres, Correction Centre and Military Treatment Units provide the in-patient program. In the initial period of in-patient therapy, most used a therapeutic community model (TC) adopted from the USA approach as a model of rehabilitation (National Institute on Drug Abuse, 2008). In general, Therapeutic communities are drug-free residential settings that use a hierarchical model with treatment stages that reflect increased levels of personal and social responsibility. Peer influence, mediated through a variety of group

processes, is used to help individuals learn and assimilate social norms and develop more effective social skills.

While the Matrix model was being adopted, Thanyarak Institute adjusted the TC's expected duration from 12-18 months to 4 months. The newly adjusted program called the FAST model (Ministry of Public Health, Department of Medical Services, Thanyarak Institute. 2003) (F - Family, A – Alternative treatment activities, S – Self-help and T – Therapeutic community) was initiated to serve a large demand for treatment by ATS users. As a national academic centre for drug dependence treatment, Thanyarak Institute has been training staff on the use of the FAST model in every in-patient treatment centre in the country. Even though the two models are different in concept – Matrix model emphasizes cognitive behaviour treatment while FAST model emphasizes behavioural change in a new environment, both the Matrix model and the FAST model methods are applied to almost all treatment service centres depending on the facilities they have.

At present, there is not an evaluation or assessment of methamphetamine or yaba treatment rehabilitation among those models in Thailand. Despite an increasing number of treatment programs, a systematic and standard follow-up assessment needs to be set up to monitor retention and relapse especially the process and outcomes of the drug dependence population's progression during the treatment.

1.2 Research Questions

Which treatment rehabilitation models, FAST or Matrix models provide better outcomes for the methamphetamine users?

1.3 Hypothesis

Drug dependence patients who attended either FAST model or Matrix model had the same outcomes in terms of abstinence and other improvement such as their social functioning.

1.4 Objectives

1) To compare abstinence rate and the duration of abstinence from illegal substances between those attending FAST and Matrix models

2) To assess the improvement of drug dependent patients during the period of treatment and after discharge

1.5 Expected Benefit

1) *Individual and social level*. Drug dependents will receive an appropriate care which will have the effect of improving their quality of life, i.e.

- In the short term, they can stop using drugs which can improve their health.
- In the long term, if they can abstain from drug use they may get good jobs and improve their relationship with their families. Moreover, it could reduce some social problems such as crime committed by drug users, etc.

2) *Drug dependence treatment centre level*. The outcomes can be used to develop their services in general and lead to adjustments to the treatment.

3) *Policy level*. The outcomes can be used for planning adjustments to the treatment systems and services. This can lead to better coordination and better use of resources in the areas to get the best benefit.

1.6 Operational Definition

Drug/substance dependent: People who are addicted (regularly use) to any illegal substances determined by Narcotic Act B.E. 2522 (1979).

Treatment: According to the Principles of Drug Addiction Treatment, A Research Based Guide (National Institute on Drug Abuse, 1999:13) has defined that drug addiction treatment can include behavioural therapy (such as counseling, cognitive therapy, or psychotherapy), medication, or a combination of these approaches. Behavioural therapies offer people strategies to cope with their drug cravings, teach them ways to avoid drugs and prevent relapse, and help them deal with relapse if it occurs.

Rehabilitation: A term for the process of medical and/or psychotherapeutic treatment, for dependence on addictive substances such as alcohol, heroin, methamphetamine, etc.

Relapse: The patients' report of using any illegal substances. In the case of psychotropic drugs, patients will be considered where there is use without a prescription.

Social functioning: Earning their living like normal people such as having a job, helping family, supporting others sometimes.

Summary

This chapter has detailed the methamphetamine or yaba dependent situation and problems related to it in Thailand. Since the "War on Drug" government policy has regarded drug dependents as patients and the two models, Matrix and FAST models are used for rehabilitation. The treatment has developed for those users but there has been less emphasis on the assessment of treatment outcomes. In addition, the "FAST model" rehabilitation program is unique to Thailand. Thus, the research proposes to assess the outcomes of the two treatment rehabilitation models in terms of improvements recorded, especially drug free among the methamphetamine dependents themselves and any improvements in their being able to integrate into the wider society.

CHAPTER II

LITERATURE REVIEW

2.1 Methamphetamine Use in Thailand

Historical documents described opium smoking as a major national problem in Thailand since the 16th Century. The first heroin epidemic lasting a few years occurred in 1959. During the 1970s the abuse of ganja (cannabis), opium, morphine and methamphetamine or ATS also increased in concurrence with heroin abuse. The extent of the heroin epidemic dominated the abuse of all other substances then. However, the widespread availability of amphetamine-type stimulants (ATS) led to its abuse superseding heroin abuse in the late 1990s.

2.1.1) The first period of methamphetamine abuse epidemics

Amphetamine has been available in Thailand with the name of "YaMa" for more than 30 years. The meaning of "YaMa", (Ya in Thai means drug, Ma in Thai means horse) is the drug that can enhance energy to work like a horse. After that it was changed to "YaBa" in 1996, as the government at that time wanted people to be aware that "YaBa" is dangerous and intoxicated. "YaMa" was first used by a small group of laborers and truck drivers. Since 1974, methamphetamine has been found in chemical analyses of drug seizures. In addition, fake YaMa was discovered, neither amphetamine nor methamphetamine in pill form. Afterwards, the appearance of fake YaMa increased. ATS or illicit stimulant tablets containing amphetamine sulphate has been confiscated by law enforcement officers since 1959 albeit few cases and small quantities. In the early 1970s, the frequency of the illicit stimulant indictment increased. Methamphetamine was found in illicit stimulant tablets instead of amphetamine sulphate. It appeared in 1980 in combination with other stimulants commonly ephedrine and caffeine (Vichai Poshyachinda, Paipun Phittayanon and Usaneya Perngparn, 1988). Since then the recipe of combined ATS became common.

In 1972, few patients of the Thanyarak Hospital (Thanyarak Institute), the largest in-patient DDTC located in the suburbs of Bangkok, reported ATS as their principle drug

used during the last 30 days before treatment admission. Between 1977-1979, about 7% of 2,021 drug dependence treatment patients at Khon Kaen Hospital reported ATS use and most of them were students. The intravenous administration of ATS was reported by more than half of the treatment patients of Khon Kaen Hospital in 1980. The tablet was dissolved by heating in water and injected intravenously frequently in combination with opium and/or diazepam.

In addition, in 1979 about 35% of drug offenders in Khon Kaen prison reported using ATS in combination with other substances such as cannabis, heroin and diazepam. Intravenous administration with opiate and/or tranquilizers was common among users who were not students (Vichai Poshyachinda, Manit Srisurapanont and Usaneya Perngparn, 1999).

A series of surveys of the teacher college and vocational school students during 1977-1978 reported about 2-25% of female and male students had experience of using ATS. The percentage of response on ATS use was more than twice those of heroin use. The abuse of ATS among students from a few large surveys of the Ministry of Education revealed a wide range of prevalence. The highest prevalence was found among college students in 1981. The range of percentage on their experience was 10.4-16.9% among the vocational students and 14.0-30.6% among education training students.

2.1.2) The second wave of methamphetamine epidemics

Since 1990 the indictment on ATS increased gradually from 3.7% in 1990 to 14.1% in 1995. The increment escalated rapidly in 1996 and 1997 to 33.0 and 49.8% respectively. The indictment on use and possession of ATS which reflected the users contributed about 80% of the total. A similar pattern of increase in ATS indictment was observed among juvenile drug offenders between 1994 and 1998. Moreover, drug dependence treatment statistics showed new cases of ATS users also increased, about 1-3% during 1990-1995 to 11-34% in 1996-1997 and 50-66% in 1998-2002 (Ministry of Public Health, Department of Medical Services, 2002). Besides the increases in ATS abuse, the data also revealed clearly the trend of a change in route

of administration from oral and injection to smoking or inhaling. (Vichai Poshyachinda and Usaneya Perngparn, 2002).

In the early 1980s, two studies of illicit stimulant availability at petrol stations along the highways were conducted by purchasing attempt. The first study was made at 207 and 64 stations on the highways of northern and central regions respectively. Another study sampled 68 petrol stations along the northern highway. Both studies' results were more or less similar. About 1/3 of purchases of ATS were successful (Vichai Poshyachinda, Manit Srisurapanont and Usaneya Perngparn, 1999). In addition, 57 ten-wheel drivers were studied by urinary methamphetamine screening. Overall ATS urinary positive was 82.5% (Mongkolsirichaikul, Mokkhavesa and Ratanabanangkoon, 1988). The high prevalence of methamphetamine use by truck drivers in the 1990s was demonstrated in many studies (Yothin Swangdee and Pimolpun Isarapakdee, 1991; Prasatthong, Im-erb, and Kittipibool, 1995; and Jivong, 1996).

The use of ATS as a functional purpose by wage laborers, truck drivers and commercial sex workers was prevalent. A study of sugarcane harvesters in 1995 indicated that about 6% of 454 laborers currently used ATS. These harvesters also reported a tendency to increase their dose and frequency per day during the sugarcane harvest (Abha Sirivongs na Ayudhya, Suthichit Chintayanond and Ratana Jarubenja, 1995). Different levels of prevalence were found among drivers of various types of vehicles and travelling distance. Distance beyond 100 km. tended to be the approximate determining distance for ATS use while the ten-wheel truck and petrol truck drivers also tended to use more ATS than air-condition bus drivers (Prasatthong, Im-erb and Kittiapibool, 1995). Regarding commercial sex workers, the main reasons that drove them to use ATS related to supporting their functions i.e. 77.7% used to improve negative temperament, 78.5% used to stop worry and anxiety, 84.3% used for any social-related functions and 94.6% used for any work-related functions. (Marsden *et al.*, 2002).

In 2001, 2003, 2007 and 2008 the Administrative Committee on Substance Abuse Academic Network (ACSAN) composed of academics from 5 Thai universities

conducted household surveys throughout the country (ACSAN, 2004, 2007 and 2008). The 2001 survey estimated 7.8% or 3.5 million of the Thai population aged 12-65 years had ever used meth-amphetamine. Among those who had ever used, 1.1% or about 490,000 people had used within the last 30 days and it was ranked number one among all drug use. Moreover, the number who had used methamphetamine 20 days out of the last 30 days before the interview or who claimed to be "dependents" was estimated at about 200,000 persons. In the 2003 survey however the number of methamphetamine users in the same period decreased to 34,100 people. Methamphetamine was thus ranked number two after kratom because the survey period corresponded to the "War on Drug". Regarding the survey in 2007, 335,806 people reported using a substance within 30 days and methamphetamine was ranked the third most mentioned substance used (22,857 people) after kratom and inhalants. The 2007 and 2008 surveys have included the question about ice, a type of amphetamine, and a new drug which has been available since the "War on Drug". The number of people who had experience of using ice were larger in 2008 than in 2007. (about 78,000 and 42,000 persons respectively). In 2007, the majority of ice users (60%) lived in Bangkok while in 2008, 70% lived in the northeast. About a half of ice users were of working age (25-44 years). Males tended to use ice more than females in every region.

Most methamphetamine users were in the northeast and Bangkok, with an increased rate of use from 1 in 1,000 of the Bangkok population in 2003 to 7 in 1,000 population in 2007. With regard to the age group and occupation of methamphetamine users, a high proportion was students or those aged between 12-24 years. Among students, new users are accountable for 20% of overall student users while temporary workers are 3.9% and permanent workers are 2.6% in their own groups. These students mostly are occasional users while the others are laborers and farmers (Poshyachinda *et al.*, 2005). Numbers of first time users in 2007 were highest among the unemployed (40% of all first time users), with the rest being mostly students (28.6%) and regularly employed people (28.6%) (Assanangkornchai *et al.*, 2008).

During 2004-2008, the Ministry of Health has reported about 40,000-88,600 cases attended the treatment (ONCB, 2009). The ratio of compulsory treatment to voluntary is 1.7:1, 2.3:1, 2.2:1, 2.4:1 and 4.1:1 respectively. Of these, 70-80% used methamphetamine, yaba. Other interesting data of methamphetamine users have also mentioned as follows:

- About 85-90% aged 15-34 years old,
- About 86-92% was male,
- More than 70% was 15-34 years old,
- 55-75% never married,
- Less than 17% was student while unemployed rate was quite high, 20-28%.

2.1.3) Consequences of methamphetamine abuse

1) Methamphetamine psychosis

As a central nervous system stimulant, methamphetamine (MA) directly affects the central nervous system. Affects include irritability, insomnia, confusion and paranoia. The following studies have confirmed MA psychosis among abusers. The first two studies were in Japan where amphetamine has been available since the Second World War. A study of 104 MA psychoses in psychiatric units at Tokyo Metropolitan Matsuzawa Hospital in Japan reported more than half of the patients were discharged within one month while 16 patients were hospitalized for more than 3 months. Most of the patients showed paranoid psychotic states similar to schizophrenia, consistent with previous reports (Iwanami *et al.*, 1994). Whereas Matsumoto *et al.* (2002) reported that the time from first MA use to first psychotic episode showed significant differences between the different routes of administration - smoking, injecting and smoking and injecting; groups smoking had experienced the first psychotic episode soonest (1.7 years, SD 2.0), while groups injecting had experienced the first psychotic episode latest (4.4 years, S.D. 2.3). A recent study in the US analysed the relationship between methamphetamine use and health and social outcomes from 106 respondents. The most prevalent health

effect was weight loss. A significant number of respondents experienced severe psychological symptoms: depression, hallucinations, and paranoia.

In Thailand Chemical analysis of an ATS or yaba tablet reported containing about 20-25% methamphetamine. (Poshyachinda *et al.*, 2005). Thus, using high doses of ATS continuously can lead to psychosis. After the epidemic of methamphetamine in 1996, the number of ATS related psychosis patients increased rapidly. Suanprung, a psychiatric hospital in Chiang Mai Province reported methamphetamine psychosis increasing from 303 cases in 1996 to 3,607 cases in 2001 (Kittiratanapiboon, 2003). At present, ice in which the content of methamphetamine in combination is more than 98% is being distributed. A gram of ice costs about 3,000 baht so only rich people can afford it. This situation may lead to a lot of methamphetamine psychosis in some hospitals especially in the private hospitals (Apinun Aramratana, Niyada Kiatying-angsulee, and Usaneya Perngparn, 2006)

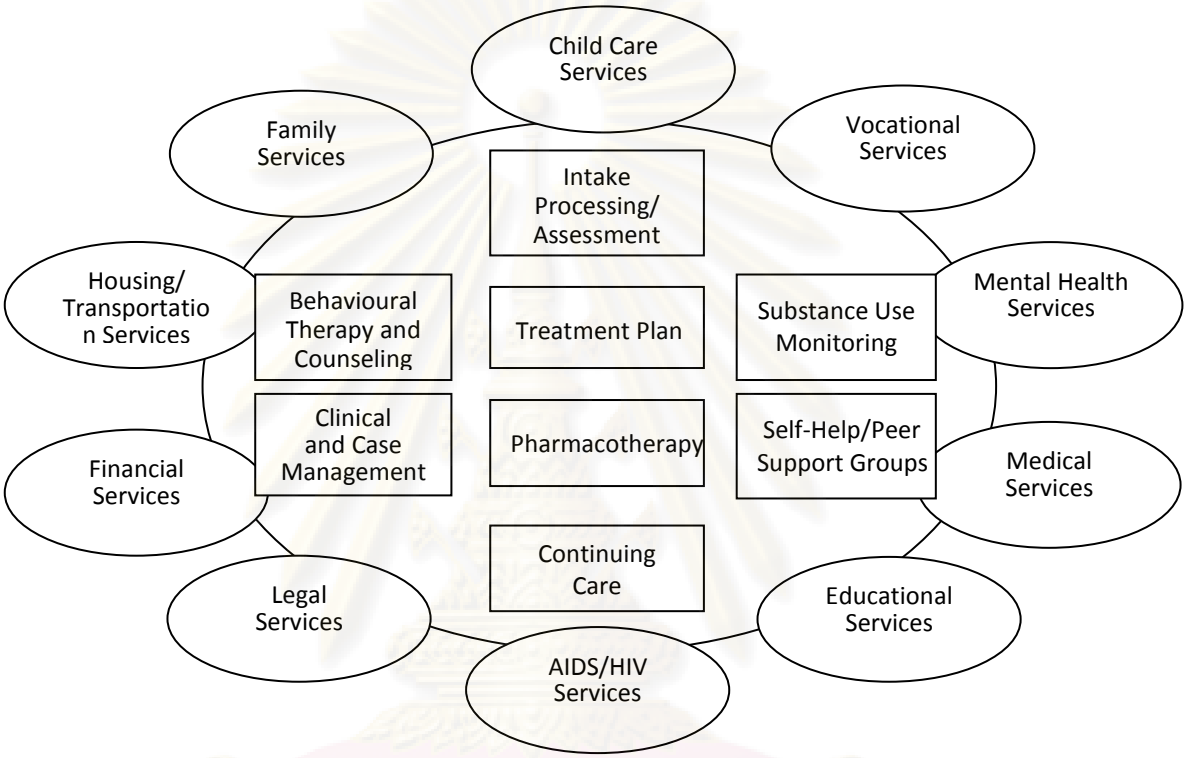
2) HIV and sexually transmitted infections (STIs)

Methamphetamine use is a known risk for infection with HIV and other STIs. In Thailand, health impacts from methamphetamine use are not fully explored or yet recognized among young drug users. ATS use often results in enhanced sexual arousal. Heterosexual male ATS users reported more female regular and casual partners, less frequent condom use and exchanging money or drugs for sex. Female ATS users were reported to engage in sex with more partners than non ATS users. Each of these risks has been linked to HIV and STIs. Recent studies conducted by Chiang Mai University have confirmed the finding of a higher STIs prevalence rate among ATS users. For instance a study among females showed the rate of *Chlamydia trachomatis* was as high as 40% while among males it was 20%. (Sirirojn *et al.*, 2005 and Quan *et al.*, 2005). Another study among young adult MA users showed a high rate of undetected STIs: 43% of females and 35% of males had a laboratory confirmed STI, many of which were asymptomatic chlamydial infections (Celentano *et al.*, 2008). While a study among young ATS users, 686 male and 129 female in Thai border areas with Myanmar, Laos, Cambodia and Malaysia reported *Chlamydia trachomatis* and *Neisseria gonorrhea* only 9.7% and 2% respectively. Chlamydia was

found in 3 times more females than males (23% and 7%) (Apinun Aramratana *et al*., 2008).

2.2 Comprehensive Drug Dependence Treatment

Components of Comprehensive Drug Abuse Treatment



The best treatment programs provide a combination of therapies and other services to meet the needs of the individual patient (National Institute on Drug Abuse, National Institute of Health. 1999:14).

The chart shows drug abuse treatment components. Generally, the stages of treatment are preparation, detoxification, rehabilitation and after care. Once the drug dependent gets to the treatment, he/she has to be assessed about drug/substance use, situation related to drug/substance use and environment such as family and friends. After that, the appropriate treatment plan will be set to the patient individually. This plan needs to be cooperated with all involved persons including physician, nurse, counsellor, family member and patient. It must be flexible to the situation at every stage of the treatment. Detoxification and rehabilitation are important as he/she will be provided with medication, behavioural therapy and

counseling, clinical care, substance use monitoring and self help or peer support. The treatment needs to be continuing care. Other sets are the services needed to support the patient for the sustainable as fit to the goal of treatment, drug free. The outer ovals in the chart are the services which should be provided by the policy maker and related agencies both Government and non-government. (National Institute on Drug Abuse, National Institute of Health, 1999 and United Nations Office on Drug and Crimes [UNODC] and World Health Organization [WHO], 2008)

Drug dependence treatment involves 3 factors;

- Drug users/patients
- Process of treatment
- Environment

Drug users are a combination of their drug use, the people they are and their practice or behaviour. Drug dependence behaviour derives from many related factors, i.e. drug or substance availability, human characteristics such as age, sex and race. The environment consists of such things as family, friends and society. These components make drug dependents different from one another. Therefore, drug dependence treatment is quite difficult as there is no single appropriate treatment for everyone.

> Treatment varies depending on the type of drug and characteristics of patient…..The best treatment programs should provide a combination of therapies and other services (National Institute on Drug Abuse, National Institute of Health. 1999:12).

> Because addiction has so many dimensions and disrupts so many aspects of an individual's life, treatment for this illness is never simple. Drug treatment must help the individual stop using drugs and maintain a drug-free lifestyle, while achieving productive functioning in the family, at work and in society….. (National Institute on Drug Abuse, National Institute of Health. 1999:9).

The process of treatment will be a factor in the success of the patient if it has a combination of treatment with appropriate services for individuals. Drug addiction

treatment includes the process of preparation, detoxification, rehabilitation and follow-up. Within the process of treatment, the service providers are included. Good care and support from providers can improve retention rates and reduce the rate of relapse.

It is accepted that the environment of drug users is important in determining whether they can stop or carry on using drugs. There have been attempts to change the environment with the expectation that the drug user will stop using drugs. The therapeutic community for treatment is an example of changing the environment.

The goal of treatment is to stop using any addictive substances permanently. However, the primary objective of treatment services is to motivate dependents to seek treatment, to adjust the quality of life, and to reduce individual and social problems. Therefore, the success of treatment is necessary to consider the users, process of treatment and environment.

2.3 Drug Dependence Rehabilitation in Thailand

***2.3.1) Therapeutic Community* (TC)**

Origins

TC was the first term used in United Kingdom in the field of mental health to describe a new style of mental health provision termed 'social psychiatry' (Jones, 1953). The TC for substance abuse emerged in the 1960s as a self-help alternative to existing conventional treatments. This change heralded a move away from the physician as healer common in earlier models of treatment based on positivist attributes assigned to the psychiatrist (Pines, 1999). Hierarchy was flattened in the hospital and a closer therapeutic relationship was fostered between patients and also between patients and staff. The model is based on social learning where the patient learns through group therapy to understand the problems inherent in that mental health condition and then is able to change over time with the milieu acting as mirror to the self (Waesch, 1996). At present the rehabilitation duration for TC ranges from one to 24 months.

TC in Thailand was first set up at Thanyarak Institute in 1986 in order to offer a structured program for rehabilitation (Pilley, 2005). After establishment, Thanyarak offered training and support to all in-patient treatment facilities in the country. This amounted to more than 20 facilities. The model was thoroughly investigated through a joint project with the Swedish and Thai governments, supported by the United Nations Fund for Drug Abuse Control [UNFDAC], before it was introduced into Thailand (National Council of Social Welfare of Thailand [NCSWT], 1994). This development represented a major commitment on the part of the Department of Medical Services, Ministry of Public Health to improve rehabilitation for drug-users within government run hospitals.

Assessment and Induction *

It could be claimed that Thailand has provided therapeutic community (TC) for heroin patients for more than 30 years. Even though the problem moved to MA dependents, TC still provides for the hard core group and in the correction centres. Therapeutic Community is a drug treatment rehabilitation model for in-patients emphasizing self-help in the drug dependent group similar to building a new community or family for the patients consisting of 3 phases:

First Phase – A voluntary entry taking 30 days equivalent to an orientation for the patients.

Second Phase – Treatment admission taking 9 months

- *Method*

1) The patients volunteer for admission to the treatment centre and live in the community according to therapeutic community program until perceiving the "Self Discovery".

2) The patients must stay in the environment designated for the treatment where activities, rules and regulations are stipulated which lead to self discovery and behaviour re-shaping.

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* Source: Chintra Uaneklarp and Thongchai Uaueklarp. Thanyarak Therapeutic Community. Thanyarak Hospital. 1992.

- *Philosophy of Therapeutic Communit*y:

1) Humans must be rational, not impulsive in decision making – as mature and responsible beings

2) Self searching to find own flaws. Accept and rectify the flaws by themselves.

3) Help others. Be selfless for others and give love and warmth to others.

4) Live with dignity and human value.

5) No work contempt, no responsibility dispute, accept own role in the society.

6) Can live harmoniously with others in the society,

- *Tools of the House*: In the TC, the patients have to participate in the activities, follow the rules and regulations, i.e.

1) Interview

2) Pre-morning Meeting

3) Morning Meeting

4) Seminars

5) Encounter Groups

6) Hair Cut

7) Learning Experience

8) House Meeting

9) General Meeting

10) Extended Group

11) Encounter Group

12) Marathon Meeting

- *Chain of Command in the TC*

The advantages of the chain of command

1. Reliance on one another
2. Responsibility acceptance
3. Initiative, response and self-adjustment
4. Learning to achieve with perseverance
5. Self- development
6. Learning to build relationships with others
7. Living with reality not illusion
8. Searching own capability
9. Encountering others without apprehension

Third Phase – Re-entry to the society taking 9 months divided into 3 periods:

- *Period 1* lasting 3 months is an orientation period, preparing to encounter the outside environment.

- *Period 2* lasting 3 months. The patients will commute from the treatment centre to their workplace, but they will still spend nights in the centre, preparing to re-enter society,

- *Period 3* lasting 3 months. The patients will return to their residence or their families. They will earn their living and will meet the counsellor to do group therapy once a week where family therapy is also administrated.

2.3.2) FAST Model[*]

FAST model is:

F= Family: Family has to cooperate with the treatment and take responsibility for taking care of the patient when he/she lives with the family, out in the society and in the real community.

A= Alternative Treatment Activity: Choose alternative activities which are appropriate for the patient's situation for treatment therapy.

S= Self-Help: Choose the process of learning and physical, psychological and social therapy for the patient to adjust their behaviour, attitude, feelings and building relationships until he/she can live happily in the community without drugs.

TC= Therapeutic Community: The way of valuable living in the society by using TC process such as help to self, peer pressure, behaviour modification, social learning, frame of reference.

Origins

In 2002, Thanyarak adjusted the TC's expected duration from 12-18 months to 4 months. The new adjustment called FAST Model was initiated to serve a large demand for treatment by ATS users. Not only the duration but also the process and activities were changed. The first month's program was self-help and behaviour modification covering the in-patients' mental health, family relationships and living in the social milieu. Career training, peer encouragement and social assimilation

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[*] Source: Thanyarak Institute. FAST Model. 2003. And interview information from Thanyarak's staff about the operation and management.

were added in the second month. After that social learning and work on morality were implemented. It was expected that the patients would begin to change after a month of rehabilitation. Interviews with staff from both Thanyarak and Chiang Mai Drug Dependence Treatment Centre were undertaken to understand more fully how the model worked in practice. They described how 70-80% of in-patients was there on a compulsory order and only 20-30% was there voluntarily.

Assessment and Induction

On the first day of admission, patients are assessed by a nurse, a physician and laboratory tests are undertaken to ascertain levels of drug use and physical and psychological health. After being admitted to the FAST model, each patient is put under the care of an assistant supervisor (status before work). He/she is introduced to the program including the TC regulations. This process takes about a week. During the introduction period, the patient starts the program. Activities are set in place and every patient attends from the outset. Activities are on a rolling program. A patient must attend the TC type program which includes a self help group (based on improving denial skills, self control, motivation enhancement, problem solving, communication and habit reshaping) and therapeutic community alternative activities. The patient has to attend morning session and group counseling. Individual counseling is used for a person who asks for it or if he or she is deemed to have a specific problem that would benefit from it. In most cases however the patient will be taken care of by a supervisor, a work coordinator or ex-addicts called the hierarchical system. Alternate activities are both routine jobs such as cooking and cleaning and job training such as massage practice. The 12 Step Narcotics Anonymous program is also seen as being appropriate for the rehabilitation of Thai drug users when applied to social and moral behaviour. The Program is based on the following twelve steps which are worked through one at a time;

1. We admitted that we were powerless over our addiction, that our lives had become unmanageable.

2. We came to believe that a Power greater than ourselves could restore us to sanity.

3. We made a decision to turn our will and our lives over to the care of God as we understood Him.

4. We made a searching and fearless moral inventory of ourselves.

5. We admitted to God, to ourselves, and to another human being the exact nature of our wrongs.

6. We were entirely ready to have God remove all these defects of character.

7. We humbly asked Him to remove our shortcomings.

8. We made a list of all persons we had harmed, and became willing to make amends to them all.

9. We made direct amends to such people wherever possible, except when to do so would injure them or others.

10. We continued to take personal inventory and when we were wrong promptly admitted it.

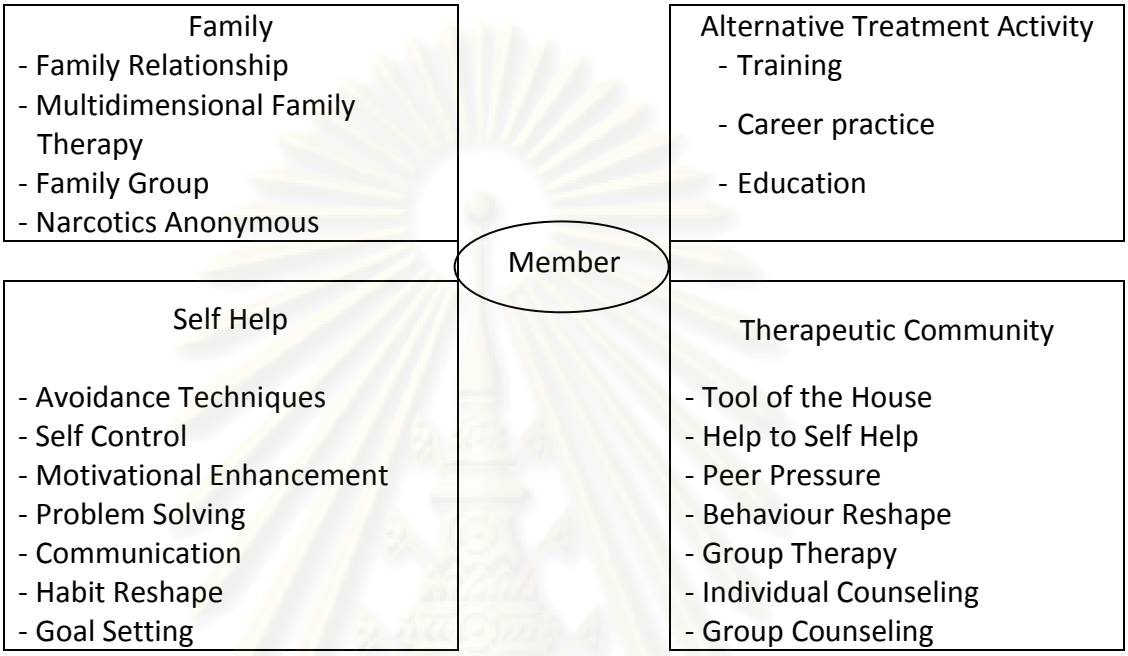
11. We sought through prayer and meditation to improve our conscious contact with God as we understood Him, praying only for knowledge of His will for us and the power to carry that out.

12. Having had a spiritual awakening as a result of these steps, we tried to carry this message to addicts, and to practice these principles in all our affairs.

There is no set period for working through the steps, each person moves forward at their own rate.

Detailed Description of the Model

FAST Model Chart



	Short Term	Medium Term	Long Term
Duration	4-6 months	6-8 months	8-12 months

Treatment plan

1. Short term treatment plan: 4-6 months. Preparation;
    - Patient who has no addictive symptoms and participates voluntarily
    - Family offers good cooperation
    - No physical and psychological complications
    - Passed diagnosis by a physician
    - Ordered to attend by a judge
2. Medium term treatment plan: 6-8 months. Preparation;
    - Patient has signs of addiction but does not need medicine and participates voluntarily

- Family offers good cooperation
- No physical and psychological complications
- Passed diagnosis by a physician
- Cannot use short term plan

3. Long term treatment plan: 8-12 months. Preparation;
    - Patient has symptoms of addiction and needs treatment
    - Family does not want to participate
    - Has physical and/or psychological complications
    - Diagnosis by physician to be admitted to the long term plan

***Family*:**

The most important activity in the FAST model is the family group. The patient is allowed to meet the family twice a week. They take part in activities together such as sharing a meal. About 30% of families in the voluntary group attended while in the compulsory group more than 70% took part. Before discharge, the patient is advised to set future plans and he/she is asked to contact the treatment centre if he/she needs help. In addition, he/she is expected to attend the treatment unit 4 times a year for monitoring.

It is claimed that the family is a small unit that can provide good care for an addict. If the family is ready to understand and forgive the patient, he/she may stop using drugs. The objective of requesting the family to participate is mainly to educate the family to cope with the problems of addiction and to provide techniques to help the patient. The family needs to have the skills to solve problems, to communicate, to understand their role, to be involved, to be responsive and to help control the patient's behaviour. The sections where the patient's family is asked to participate are as follows:

- Family relationship

- Multidimensional family therapy

- Family group

- Narcotics anonymous (NA)

***Alternative treatment activity*:**

This activity is aimed to encourage or support the patient to develop new abilities and/or interests to fill time that has been used to take drugs. These activities must be appropriate for their needs and must also fit the reality of their situation. They must learn how to use leisure time, value themselves, and develop a career. This activity also includes education groups. There are a variety of career practices to take part in such as growing plants, feeding chickens, cooking, producing cleaner solvent etc.

***Self help*:**

This activity is a process for the patient to help himself or herself to change their behaviour, attitudes and feelings until he or she can live happily in society without being drug dependent. Self help activities are as follows:

- Avoidance techniques

- Self control

- Motivational enhancement

- Problem solving

- Communication

- Habit reshapes

- Goal setting

The patient needs to write a diary to reflect on himself or herself, “who am I?”. Moreover, he/she has to learn how to cope with problems, control himself/herself, solve problems and set goals for a new life. (Ministry of Public Health, Department of Medical Service, Thanyarak Institute, 2003)

***Therapeutic community*:**

The therapeutic community is a process to encourage patients to develop a good quality of life in the future. The patient has to learn how to change or reshape their behaviour. It also emphasizes how to live together in a community. People must help each other and build a warm and safe environment. In this case, there is a tool called 'house' to punish people who break the rules. The rules are no drugs, no violence, no sex and no stealing. The ideal member will be honest, responsible, show love and concern, act as if, expect no free lunch, accept that what goes around will come around, trust the environment, understand others, agree that giving is better than receiving, and will reveal their feelings. In the hierarchy there is a coordinator on duty to control regulations and rules.

The weakness in the FAST model is the family session. Only a few parents or family members want to participate. The change that the treatment units do is to teach another way to live life. The teaching has moved patients to understand their family. Moreover there is a chance for patients to visit family sometimes during the weekend. However, the chance to visit family is limited to those patients who progress satisfactorily.

2.3.3) Matrix Model

Origins

The Model was originally developed in response to the cocaine epidemic of the 1980s in the USA (Obert *et al.* 2000). The program consists of relapse prevention groups, education groups, social support groups, individual counseling, and urine and breath testing delivered in a structured manner over a 16-week period. The treatment is a directive, non-confrontational approach which focuses on current issues and behaviour change. This model was introduced into Thailand in the late 1990s, when methamphetamine use was highly prevalent. The program materials were translated into Thai with some modifications to suit the Thai culture and context. Matrix model training courses for mental health workers were organized during that time, some of which were intensive over 3-4 months, some were shorter, 3-5 days. During the time of the War on Drugs Operation in 2003, drug users,

especially methamphetamine users were compulsorily recruited to attend the treatment system, using the Matrix model.

Assessment and Induction*

The following review is of the treatment process of Matrix Model commonly used in the Drug Dependence Treatment Centres and Psychiatric Department in Provincial Hospitals in Thailand.

The Matrix Model emphasizes various cognitive domains necessary for the patients and their families, to be integrated in principle through the "therapeutic group" activities in every period throughout the one-year program consisting of 2 phases as follows:

First Phase: Intensive Phase on Intensive Outpatient Program (Matrix Intensive Outpatient Program, IOP) is considered to be the most important and critical phase to help the drug dependents to overcome their drug abuse. The duration is 4 months.

Second Phase: After Care Program or Supportive Phase taking 4 months after first phase. The two important activities in this stage are social support group and 12-step facilitation meeting group.

First Phase – Matrix IOP consisting of 4 main activities:

a) Individual/family counseling (Individual/Conjoint Sessions). Consultations will be given to drug dependents and families as this is the adjustment period to the Matrix treatment process to which the patients and their families must adhere for it to be effective. There are 2 sessions, i.e. individual consultation and conjoint session.

Individual consultation is to be offered only to the patients. Conjoint session is when consultation is provided to the families with the company of the drug

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* Source: Suchart Tritiptikun. Matrix Model. Ministry of Public Health, Khon Kaen Drug Dependence Treatment Center, 2003. And interview information from staff of Thanyarak Institute, Chiang Mai Drug Dependence Treatment Center and Ratchaburi Provincial Hospital about the operation and management.

dependent patients to help solve any problems incurred during the first period of abstinence.

b) Early Recovery Skill Group. For patients who have failed to remain drug abstinent despite strong determination and several efforts they will learn about the effect of drugs on their brain. They will learn the following 8 skills necessary for drug abstinence 3 times a week, for one hour each time:

(1) Discontinuing the drug use cycle

(2) Exterior stimulants

(3) Interior stimulants

(4) Advice to the meeting group (12-step facilitation)

(5) Physical chemical reaction to drug abstinence

(6) Five problems frequently found in early abstinence stage

(7) Emotion and behaviour

(8) Simple directions on what to do

c) Relapse Prevention Group. Knowledge about psychological skills will be provided to the patients to help them adjust their behaviour and their way of living.

(1) Alcohol: legal substance

(2) Boredom

(3) Avoidance of relapse

(4) Something to count on/Abstinence schedule

(5) Work and drug abstinence

(6) Feelings of guilt and shame

(7) Keeping unoccupied

(8) Motivation to drug abstinence

(9) Telling the truth

(10) Giving up all substances

(11) Sexual relationship and drug abstinence

(12) Relapse prevention

(13) Trust

(14) Being wise and cautious

(15) Spiritual loss

(16) Taking care of business/ finance

(17) Reason for the first relapse

(18) Self care

(19) Emotional status to relapse

(20) Illness

(21) Comprehension of stress

(22) Reason for the second relapse

(23) Decrease of stress

(24) Anger management

(25) Acceptance

(26) Making new friends

(27) Rehabilitation of friendship

(28) Praying for serenity, avoidance of repeated behaviour/ return to risky sexual behaviour

(29) Management of gloomy status

(30) The 12-step facilitation

(31) Look to the future: solving problem while resting

(32) Stop using drug gradually (day by day)

The educational plan lasts for 16 weeks covering the above topics, 2 topics a week are covered by the patient. The service provider must be adept in understanding drug problems, observant of the patients' conversation and other body language. Additionally, for effective treatment it is essential that the service provider be strong and persevering at building good relationships with the patients.

d) Family Education group. The education is about causes of drug dependence, brain change after drug use (drug addicted brain syndrome), drug dependents' thinking and emotions, parents' role in helping the patients for the short and long term.

The patients together with their families will attend this session once a week, one hour for each session covering the 12 topics below:

(1) Stimulants and drug craving

(2) Effect of alcohol on the body and brain

(3) Meet with other patients completing the program

(4) Drug toxicity on the brain and the body

(5) Path to drug abstinence

(6) This is not my problem

(7) Relapse

(8) Effect of different types of drugs on the body

(9) Role of the families and patients after drug abstinence

(10) Alcoholism

(11) Heart to heart discussion between the patients and their families

(12) Effect of cannabis on body and brain

Second Phase – After Care Program consisting of 2 main activities, social support group and 12-step facilitation meeting group.

a) *Social Support Group*. This group will help the drug dependents during the mid-term of their drug abstinent period (3-4 months of drug abstinence). They will learn about community living without drugs with moral support from their ex-drug dependent peers. Topics of meeting are as follows:

(1) Anonymous drug dependents (NA, Narcotics anonymous)
(2) Age and the change of thought and emotion
(3) Anger
(4) Drug dependents' spouse
(5) Obligations
(6) Repeated behaviour
(7) Control
(8) Drug craving
(9) Sadness
(10) Emotion
(11) Fear
(12) Friendship
(13) Joy
(14) Suffering
(15) Feeling guilty
(16) Happiness
(17) Honesty
(18) Intimacy
(19) Separation
(20) Reason for relapse
(21) Closure of the truth
(22) Feeling overwhelmingly happy
(23) Perseverance
(24) Physical health
(25) First phase of drug abstinence
(26) Denial
(27) Relaxation
(28) Regulations

(29) Life schedule planning
(30) Selfishness
(31) Sexual relationship
(32) Be wise
(33) Thoughts
(34) Stimulants
(35) Faith
(36) Work and life

b) *The 12-step Narcotics Anonymous* program is also provided to the patients in the Matrix model to help each other abstain from drug use. These steps appear to be extensive and the abstainers should remember that they cannot possibly do everything at the same time. Since they do not become a drug dependent in a day, they must remember not to over exert themselves. The ex-addicts will be the chairpersons sometimes called “sponsor” for those who are in the abstinence period to practice each step until they have completed the 12 steps of NA.

The essentials of success in the Matrix model

- The service provider is capable of building good relationships with each patient.
- The service provider is properly knowledgeable and understands the treatment process of the Matrix Model. Satisfaction, perseverance and constant self development are requisite.
- The consistent participation in the patients’ activities.
- The cooperation and sincere determination of the patients’ families.

The advantages of Matrix model

- Knowledge domain. The contents concern in depth the relationship between the body, mind and society which enable the patients’ understanding of their physical change. Various skill practices are adopted at each step to assist the patient to develop themselves and their living skills so that they can happily reenter society.

- Good techniques. The method of educating the group enhances interactive learning, i.e. a positive approach – use either in speaking or action engenders good relationships between the patients and their families, and parents' participation in the treatment process.

The disadvantages of Matrix Model

- The frequency and duration of treatment is one year consisting of 2 phases: first phase, intensive phase lasts 16 weeks – the patients must meet with the service provider 3 days per week, and second phase, after care phase lasts 36 weeks – the patients and their families must meet with the service provider once a week resulting in it being time consuming, expensive for the families and boring which affects the total effectiveness as expected.

- The service provider must have sound knowledge and skills for consultation and assistance.

- The Model may not be effective if there are a few patients in a period.

2.4 Evaluation of Drug Dependence Treatment

2.4.1) Evaluation of Drug Dependence Treatment in Other Countries

There is a large body of literature related to the assessment of drug dependence treatment. Much of this literature is concerned with improved outcomes in a drug user's behaviour post-treatment. To this point it emphasises to effort to determine the factors which influence better outcomes. As retention in treatment is seen as key to improve outcomes, much of the literature also looks at what factors influence retention rates. Most studies determined that retention affected treatment outcomes while some studies found that other factors such as treatment intention, demographic characteristics, peer and social involvement including relationship between providers and patients were important in the assessment of different treatment models.

A study among 507 cocaine abusers in 18 residential programs, the Drug Abuse Treatment Outcome Study (DATOS), reported that no prior treatment and longer retention were positive predictors of post treatment abstinence (Hser *et al.*, 1999).

Gossop *et al.* (1999) also reported that longer stays in treatment were predictive of better 1 year outcomes. Joe *et al.* (1999) in a study focused on retention found that patient background factors were significantly related to retention, in particular, pretreatment depression, alcohol dependence, legal pressures, and frequency of cocaine use. Motivation at preparation was also a strong determinant of therapeutic involvement. A longitudinal study of 408 patients attending a residential program in England where 286 (70%) were followed up after one year, reported substantial improvements. Half the patients remained abstinent from opiate use; there was reduced injecting and sharing of injecting equipment; there were also visible reductions in heavy alcohol drinking and criminal behaviour.

An assessment study of 242 patients from a residential program in the National Treatment Outcome Research Study (NTORS) project reported that 40% fully completed the treatment and this group had a better outcome. (Gossop *et al.*, 2002). Another paper was a comparison of four modalities reported reductions in problem behaviours at the group level during the first year and were maintained at 2 years. Moreover, the stability outcome was found at the individual level (Gossop *et al.*, 2002a).

A multi-site comparison of psychosocial approaches for the treatment of methamphetamine dependence compared the treatment-as-usual to Matrix model. Matrix model had better outcomes on attendance levels, and patients stayed in treatment longer. Moreover, patients provided more MA free urine samples during the treatment period with longer periods of MA abstinence than those assigned to receive treatment-as-usual (Rawson *et al.*, 2004).

A quasi-experimental study in Belgian therapeutic communities reported that participation has an impact in improving treatment retention controlling for other patient characteristics (Soyez *et al.,* 2006). Anderson et al. 2007 wrote that relapse status was predicted by age, social support and person-centred factors (diagnosis).

Carlson (2001) reported that longitudinal research should be encouraged to confirm that patient satisfaction is related to both services and abstinence from substance use. This research studied the relationship between each of the satisfaction items

and duration of therapy. The satisfaction with access to services and satisfaction with the effectiveness of services were associated with therapy hours. On average patients who attended 17 hours or more reported the high level of satisfaction. The participation in self-help groups, number of therapy hours and abstinence at baseline from substance use were predictors of abstinence at one year. Patients who attended in self-help groups at least once a week were more likely to abstain from substance use than those who participate less than once a month. Each additional therapy hour was associated with one percent increase in the chances of abstinence. Also, patients who had high levels of satisfaction with access and with effectiveness were more twice of abstinence than those who reported low level.

The preceding papers show that there is a great deal of concurrence in what improves outcomes. There is some evidence that some models appear more effective than others but underlying all of this are the two main points that retention in treatment leads to more positive outcomes and that motivation to seek treatment is also important in determining outcomes.

2.4.2) Evaluation of Drug Dependence Treatment in Thailand

An evaluation of Government run substance misuse treatment centres (Usaneya Perngparn *et al.*, 2001) looked at the outcomes of treatment processes by three different government agencies, i.e. the Ministry of Public Health, the Military Hospital and Bangkok Metropolitan Administration Narcotic Clinics. The project reported that different types of drug use and treatment facilities affected relapse outcomes. In 2004, another project (Dheerarat, 2004) reported on drug dependence treatment activities provided by the drug dependence treatment centres compared to those of the hospital services. The project also evaluated the outcome of drug dependence treatment. Six Drug Dependence Treatment Centres (DDTCs) in the Northern, Northeastern, Southern and Central regions, and 5 provincial hospitals in the same regions as DDTCs were assessed. Patients who attended 3 types of services, i.e. detoxification program, Matrix model and therapeutic community were recruited. Although in the longer period, relapse rates among Matrix model and TC showed better outcomes, there was no difference of abstinence rates before three

months after treatment of methamphetamine users who attended out-patient and Matrix model. After a one year follow-up, the percentage of out-patient attendance decreased to 8% while the Matrix had doubled abstinence rates. The Matrix model reported its effectiveness only if the attendees were willing to stay more than 120 days.

2.5 Cost Effectiveness of Drug Dependence Treatment

When the assessment of the treatment program is considered, it is difficult to avoid mentioning cost effectiveness even though this study will not specifically measure this. A study on cost benefit analysis of residential and out-patient addiction treatment in the State of Washington (French *et al.*, 2000) reported the difference in average economic benefit between full continuum and partial continuum care as positive ($US8,053) and statistically significant full continuum over partial continuum care ($US2,530 versus $US1,138, $p < .01$). Torchia (2005) referred to Dr. Michael T. French of the University of Miami in Coral Gables, Florida on the database of cost-effectiveness of drug treatment by using the Drug Abuse Treatment Cost Analysis Program (DATCAP) and the addiction severity index (ASI) to estimate the economic costs and benefits in five programs in Washington state that serve patients in publicly funded programs. The program looked at 85 treatment programs (53 out-patient programs and 32 residential programs) surveyed between 1993 and 2002. It was found that methadone maintenance programs had lower labor costs (55 percent of total costs compared with 68 percent for standard outpatient programs) and relatively higher costs for supplies and materials. Moreover, standard out-patient programs were marginally less expensive than intensive programs (mean total cost for a client's treatment episode $US1,944 versus $US4,445). Among residential programs, in-prison therapeutic community was the least expensive while therapeutic community cost the highest (mean total cost for a client's treatment episode $US1,534 versus $US18,802). However, there was no explanation why in-prison therapeutic community cost less.

In Thailand, the cost of drug treatment has been increasing every year. Thanyarak Institute (2006) has estimated their cost in the fiscal year 2004-2005. The cost of

out-patients in 2004 and 2005 was 16,779-19,551 baht/case ($US479.4-558.6) while Matrix model attendance costs were 20,524-25,480 baht/case ($US586.4-728). For the residential program, the service cost for in-patient detoxification in 2004 and 2005 was 19,296-25,327 baht/case ($US551.3-723.6) and rehabilitation cost was 25,990-29,457 baht/case ($US742.6-841.6). According to research undertaken by Buranee Kanchanatawan *et al.*, 2005, where the cost of treatment was compared in 3 systems (voluntary, compulsory and correction systems), the correction system was the least expensive followed by voluntary and compulsory system (full cost per client 19,058 baht or $US544; 51,033 baht or $US1,458 and 108,648 baht or $US3,104 respectively). The in-patient cost was more expensive than out-patients, voluntary in-patient rehabilitation: voluntary out-patient rehabilitation was 5:1 and compulsory in-patient rehabilitation: compulsory out-patient rehabilitation was 11.4:1. The latest study collected data on cost analysis in 10 treatment units covering all types of treatment in 2007 (Siripen Supakankunti *et al.*, 2009) reported that the ratio of expense in all activities – preparation: detoxification: rehabilitation: follow-up and evaluation: and others was 0.2651: 0.0600: 0.5364: 0.0900: 0.0486. The most costly was rehabilitation. Moreover, the cost of residential rehabilitation was the highest ranged 37,092 to 65,181 baht/case ($US1,060-1,862). Whereas the less cost was out-patient with Matrix program, only 1,310 baht/case ($US40).

In Summary

This chapter has presented some literature reviews in related aspects. Firstly, the epidemic of methamphetamine in Thailand and current situation reviews aim to formulate more understanding about the severe situation of methamphetamine epidemic and lead to the proper treatment. Secondly, the health problems, available treatment/ rehabilitation models in Thailand. Some information derived from institutions handbooks and interview from key informants. Next reviews, the studies of drug dependence treatment evaluation which review some research reports from Thailand including other countries. And lastly, the comprehension of treatment and cost-effectiveness of drug treatment are added for more understanding. The reviews mainly provide information and factors which might help to formulate the variables and indicators for this study.

CHAPTER III

RESEARCH METHODOLOGY

This project is designed to assess the process and outcome of the treatment rehabilitation program, Matrix model for out-patient and FAST model for in-patient which are the most utilized model in Thailand. The Models are run by the original treatment model units and their staff have skill for each model, that is Thanyarak Institute, Chiang Mai Drug Dependence Treatment Centre and Psychiatric Department, Ratchaburi General Hospital. It is expected to compare the outcomes of treatment in-term of relapse and social function after 6 month period of follow-up.

3.1 Conceptual Framework

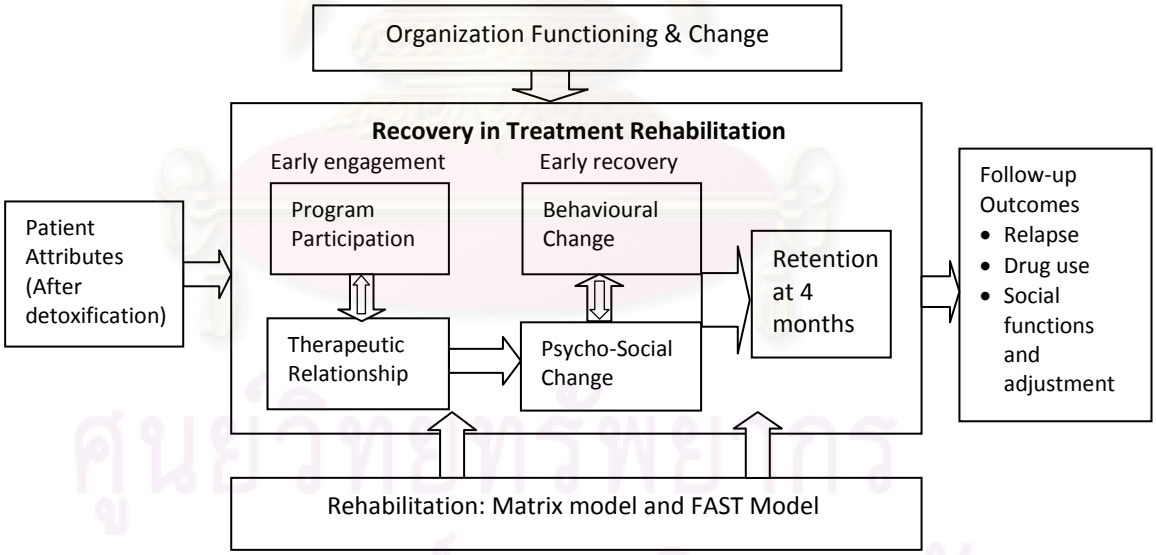
The study has reviewed “A conceptual framework for drug treatment process and outcomes” of Simpson (2004) and adjusted to use as the assessment framework of FAST and Matrix models.

> "The purpose of treatment process and outcome research captured in the model is four-fold. First, it should promote the use of patient performance and monitoring indicators that serve as interim criteria related to treatment planning and effectiveness. Second, it should demonstrate the stages of patient change in treatment and how specific interventions can be used to address particular needs throughout the recovery process. Third, it should clarify the rationale for using individual-level and aggregated patient records of engagement and performance as indicators for feedback to counsellors and patients, program performance monitoring, and management of services. Finally, it should be a foundation and guide for studying treatment gaps and improving organizational functioning and change (i.e., technology transfer, or moving science to services" (Simpson, 2004: 101).

Therefore, this study will use Simpson's research tool to evaluate the effectiveness of participation in Matrix and FAST models as the framework component fit in the activities of those two models. The chart shows the process of the evaluation. According to Texas Christian University (TCU) treatment model, it identifies key

factors associated with effective process and outcomes of specific treatment episodes. It focuses attention on sequential phases of the recovery process and how therapeutic interventions link together over time to help sustain engagement, thereby improving patient functioning during treatment and after discharge.

Patient attributes at intake in this study include patient background, motivation for change, readiness for treatment and problem severity at intake. Also, the program determines whether FAST or Matrix model is selected. The first step towards recovery in treatment is early engagement which is program participation and a counseling relationship (rapport personal bonding and satisfaction of services). The second major stage is early recovery which is reflected by psychosocial and behaviour changes. Even though retention is a strong predictor of post-treatment outcomes, the two models require 4 months equally. After discharge, patients will be followed up regarding their social function and adjustment, relapse and substance use including alcohol.



Study process

The study process will be set into 3 stages as follows: baseline assessment, measurement of improvement during the rehabilitation period and follow-up.

The first stage, baseline assessment has completed after the patients have been assigned to the model. They will be interviewed about general characteristics (e.g. age, race, religion, place of birth, present resident etc), socio- economic and environment including the main assessment, history of drug/substance use and the problem.

The second stage has completed during attending the model, measurement of patient's improvement during the program at 1.5 and 3 months. The study has reviewed "A conceptual framework for drug treatment process and outcomes" of Simpson (2004) and adjusted to use as the assessment of FAST and Matrix models during attended. According to TCU treatment model, it identifies key factors associated with effective process and outcomes of specific treatment episodes. It focuses attention on sequential phases of the recovery process and how therapeutic interventions link together over time to help sustain engagement, thereby improving patient functioning during treatment. Patients have to evaluate of self and treatment by filling in the questionnaire ratings of self, treatment process and program attributes. It is expected that patients who get improvement in the program will improve after discharge.

Even though Matrix and FAST models are different interventions, the objectives aim at the patients' abstinence from addictive substances, behaviour change and a normal life in the community.

The Matrix model is used for out-patients who abused or addicted drugs especially methamphetamine. Patients and their family will attend the programs as assigned. The first phase, Matrix IOP (Individual/family counseling, early recovery skill, relapse prevention and family education) will be implemented for 4 months. Urine test is common checked all the period of attending. As the program is mainly cognitive behaviour therapy, the relationship between patients and providers/counsellors are important. They will be discharged after they are drug free.

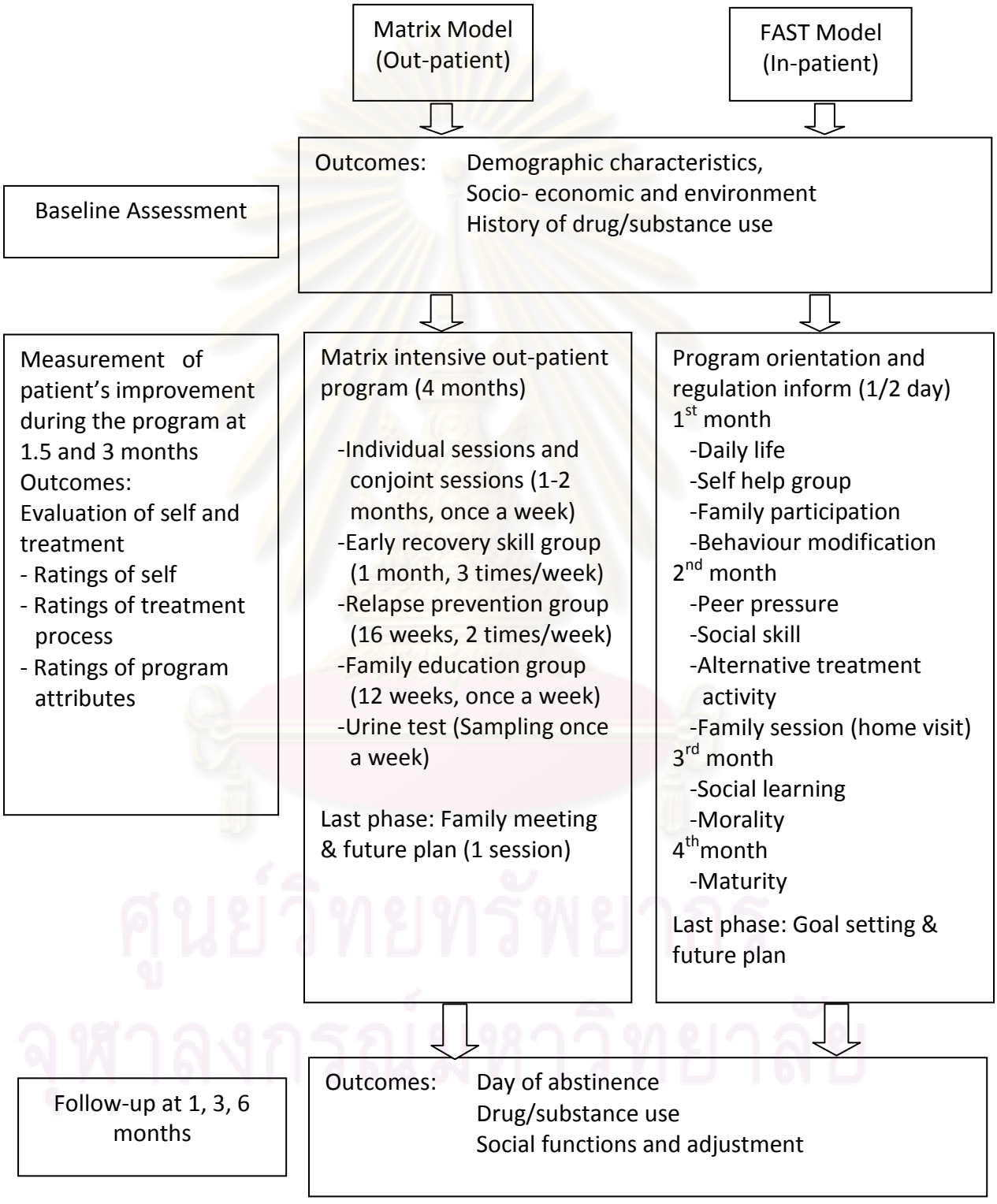
The FAST model applies for in-patients. Patients are required to stay in the treatment unit for at least 4 months. The programs are mainly behavioural modification and environmental adjustment (social skill and learning, peer pressure, morality, maturity) the same as therapeutic community including family participation.

Last stage, after discharge, patients will be followed up at 1, 3 and 6 months regarding their social function and adjustment, relapse and substance use including alcohol. The main of objective of the study will be the different outcomes of Matrix and FAST models, duration of abstinence and their improvement.

Additional information

This study has interviewed some key persons including three nurses in each target treatment unit and two Drug Addict Rehabilitation Sub-committee, - a psychiatrist and a psychologist. It was the in-depth interview about their role and treatment operation. Also, the observation of treatment has been carried out. It is expected to use the information to interpret and discuss the outcomes.

STUDY PROCESS



3.2 Methods

Samples

In-patients and out-patients aged 15-35 years old are randomly sampled from the Drug Dependence Treatment Centres (DDTCs), i.e. Thanyarak Institute and Chiang Mai DDTC. Also, out-patients at Ratchaburi Provincial Hospital are selected because the Hospital is one of original adopted Matrix model as well as Thanyarak and Chiang Mai DDTCs. Only male patients are studied as the percentage of female drug treatment patients (ONCB, 2009) accounts for less than 14% each year and the treatment service is separated for female and male groups.

Inclusion Criteria are as follows:

1. Reported use of methamphetamine in the past 12 months and use on at least 10 days prior to study entry;

2. Attendance for methamphetamine treatment at Thanyarak Institute, Chiang Mai Drug Dependence Treatment Centres and Ratchaburi Provincial Hospital;

3. Never attended the same treatment rehabilitation model prior to recruitment;

4. Ability to understand the purpose of the study and complete study interview materials.

5. Male aged 15-35 years.

Exclusion criteria are as follows:

1. Unable or unwilling to give informed consent;

2. Discernible deficit of cognitive function, signs of psychosis or other significant psychopathology;

3. Medical conditions that would preclude safe study participation (e.g., recent heart attack, stroke, or other conditions indicating significant cardiovascular illnesses);

4. Currently dependent on substances other than methamphetamine.

Sample Size

The two-sample t-test is used and suppose a proportion p of a total n subjects come from Matrix model group and a proportion q from FAST model group (p + q=1). The scores in both groups are taken to be normal distribution with the same variance. The two-sample t-test rejects H_0 when:

$$n(pq)^{1/2}(\bar{X} - \bar{Y})/s \geq t_{n-2,\alpha}$$

where $\bar{X}$ and $\bar{Y}$ are the two sample means and s^2 is the pooled within-group variance. Then, use the Master Table with:

$$\delta = (\mu_e - \mu_c)/ \sigma$$

$$\Delta = \delta/(\delta^2+1/pq)^{1/2}$$

$$n = \nu+2$$

This study recruited samples by previous study as similar study that is “Cognitive behaviour therapy and medication in the treatment of obsessive-compulsive disorder” (Connor *et al.*, 2006), the effect size (Δ) is 0.51.

$$\delta = (\mu_e - \mu_c)/ \sigma$$

$\Delta = \delta/(\delta^2+1/pq)^{1/2}$ where p=q=0.5

$\Delta = 0.51/[(0.51x0.51)+2)]x\ 0.5$

$\Delta = 0.451307$

From table (Kraemer &Thiemann, 1987: 110)

at 5% level, two-tails test, 80% power

Δ=0.45 → n=35 cases

Δ=0.51 → n=27 cases

n = [(35+27)/2]

n = 62/2 = 31

n = ν+2

n = 31+2 = 33

For a two-tailed test, at 5% significance level, with 80% power, the required sample size (Kraemer and Thiemann, 1987) is 33 for each group. According to a previous study, an evaluation of drug dependence treatment (Laeid Dheerarat and Usaneya Perngparn, 2004) which followed up treatment drug dependents from 6 DDTCs and 5 Provincial Hospitals, they reported 19.8% as the maximum percentage of lost follow-up at 3rd month. In anticipation of 20% loss for follow-up, the sample size was increased to 40. All data were analyzed at a single point at the end of study. Therefore, final study samples must be at least 40 cases per group.

This study has recruited 84 cases of Matrix model and 92 cases of FAST model and the final follow-up cases for two models are 45 and 47 cases respectively which are enough to conclude the outcomes.

3.3 Outcome Measures

Measurement

The study defines primary and secondary measurement as follows:

1. Primary measurement
    - The abstinence rate comparing between the Matrix and FAST model attendants.
    - Duration of abstinence after 6 month follow-up
2. Secondary measurement
    - Recovery in treatment rehabilitation by comparing mean scores of ratings scales of categories define below.
    - Improvement of patients after follow-up comparing relapse and non-relapse cases

Baseline Information

After obtaining inform-consent, the patient will be interviewed by trained fieldworkers. The questionnaire used was obtained from a previous study (Laeid Dheerarat and Usaneya Perngparn, 2004). The questions included demographic characteristics, socio- economic, family and social environment questions as well as history of drug use, current drug/substance use, route of administration, experience

of treatment, imprisonment, level of addiction and problem. (See Appendix 2)

Measurement of Recovery in Treatment Rehabilitation

This assessment of patient's recovery in treatment rehabilitation needs and performance in treatment can be self-administered or completed in an interview by program staff. It includes short scales for *psychological functioning* (self-esteem, depression, anxiety, self-efficacy), *social functioning* (hostility, risk-taking, social conformity), *treatment motivation* (treatment readiness and pressures), *participation in treatment* (therapeutic engagement, personal progress, Trust group and program staff), *counsellor attitude and behaviour* (counseling rapport and competence), and *program attributes* (treatment services, peer support and social support). These measures are used for monitoring client performance and psychosocial changes during treatment (as well as program-level functioning), and are interim criteria for evaluating treatment interventions as conceptualized in the *TCU Treatment Model*. Each item has a defined set of questions which can be scored both direct (from 1 to 7) and reverse scale. The following items present the evaluation of self and treatment sections and categories. (Details in Appendix 2)

EVALUATION OF SELF AND TREATMENT

SECTION A. RATINGS OF SELF	SECTION B. RATINGS OF TREATMENT PROCESS
A.1 PSYCHOLOGICAL FUNCTIONING SCALES	B.1 PARTICIPATION IN TREATMENT
a. Self Esteem (SE)	j. Therapeutic Engagement (TE)
b. Depression (DP)	k. Personal Progress (PP)
c. Anxiety (AX)	l. Trust Group (TG)
d. Self Efficacy (PM)	m. Program Staff (PSF)
A.2 SOCIAL FUNCTIONING SCALES	B.2 COUNSELLOR ATTITUDE AND BEHAVIOUR
e. Hostility (HS)	n. Counsellor Rapport (CR)
f. Risk Taking (RT)	o. Counsellor Competence (CC)
g. Social Conformity (SC)	SECTION C. RATINGS OF PROGRAM ATTRIBUTES
A.3 TREATMENT MOTIVATION SCALES	p. Treatment Services (TS)
h. Treatment Readiness (TR)	q. Peer Support (SUP)
i. External Pressures (EP)	r. Social Support (SS)

Measurement of Follow-up Outcomes

After discharged, patients will be informed about home visit and follow-up at 1, 3 and 6 months respectively. There are many factors might be effected to drug abstinence, such as the patients, providers, treatment program and the environment. This study defines 3 variables which can be measured as outcomes, day of abstinence, drug use and alcohol drinking, and social adjustment after treatment compared to before treatment. The questionnaire used is obtained from a previous study (Laeid Dheerarat and Usaneya Perngparn, 2004). The measurement questions mainly are illegal drug use or relapse and social functioning especially family relationships, i.e. helping in family's chore, taking care of family, earning income and their general behaviour.

Statistical analysis

Descriptive statistics*:* To summarise the contents of baseline data and follow up outcomes (e.g. demographic characteristics, socio-economic characteristic, history of methamphetamine use and other behaviours etc.), percentage and central tendency measurement have been applied.

Chi-square and t-test*:* Analyses are used to test significant associations between FAST and Matrix models, and difference of outcomes.

Rate of abstinence: Comparing drug free cases after 6-month follow-up of Matrix and FAST models by rate of abstinence per total recruitment.

Survival graph and Cox-regression*:* Regarding follow-up outcomes, comparison of Matrix and FAST Model relapse are analyzed by Survival graph (Kaplan-Meier) and Cox-regression on number of days since stopping illegal substance use.

3.4 Research Operation

All treatment patients in the treatment units will be investigated by physicians and laboratory tests will be performed before sending them to the rehabilitation program. They should be drug free when they enter the program. After detoxification, the patient is motivated attend the rehabilitation program which is appropriate for himself. For instance, if he is unemployed and has family members to

support, he should attend FAST model. If on the other hand he has a job or lives near the treatment units, he should attend Matrix model. The decision of attending FAST model (in-patient) or Matrix model (out-patient) will be planned together between the patient and the doctor or a responsible provider such as a counsellor. Even though some treatment units do not provide an in-patient program, the patient will get the information about the FAST model as well.

The study begins when the patient enters the FAST (in-patient) or Matrix (out-patient) model. Patient who fit the criteria is informed about the project and the duration of participation. If he agrees to join, he will be asked to sign a consent form. In addition, if the patient is younger than 18 years old, the parent or elder family member must sign for permission too.

During the 4-month program, the patient is assessed twice at 1.5 and 3 months after attending the program. Repeated assessments over time provide a basis for monitoring patient change and care planning. The questionnaire used is the "Evaluation of Self and Treatment (TCU correctional outpatient form)". It offers a thorough assessment from needs and motivation for treatment through to treatment outcome. Despite its use among a correctional population, it has been chosen to be used in this study with some modifications to apply to general yaba users in a Thai social and economic milieu. The evaluation included A) ratings of self, B) ratings of treatment process and C) ratings of program attributes. It is expected that patients will get improved after a period of attending the program.

At 4 months of attending, most patients are discharged. The providers record the discharged form and report patient's improvement. At this stage, patients must be drug free especially the out-patients, they should have negative urine results. If not, the patient will be asked to continue the program by treatment regulation. Before leaving the treatment unit, every sample is informed again about home visit or follow-up at 1, 3 and 6 months respectively. The study obtains the follow-up information from the case only. If the field worker cannot meet the case, he/she will make an appointment with the case's family member and visit the case again. Therefore, the day of appointment may not exact to 1, 3 and 6 months. The main

question about the first day of drug use after discharge must be carefully checked.

All data are checked its consistency and possibility in the treatment unit or field study. Coding, data entry and data analyses have been operated at the College of Public Health Sciences, Chulalongkorn University.

All processes mentioned are controlled closely by the principal investigator. For instance, the recruitment, if the case wants to participate, but his parent does not write an informed consent, the field worker has to decline or try to encourage his parent. If the sample attend for a period of time and he request to drop out from the study, he can drop out without any inquiry. In addition, if the case has been appointed to meet the interviewer outside his home, he will be paid for transportation. He is also paid for his working hour if he has to leave from work.

In Summary

This chapter has presented the conceptual framework and research methodology. The framework has shown the process of study at intake, evaluation during the model attending, follows up and the outcomes measurement. Samples with inclusion and exclusion criteria are revealed as the limitation. Sample size calculation and lost follow up estimation used the previous studies as baselines have mentioned as well as the process of data analysis, measurement and statistical used. Furthermore, the research operation has been presented the process of work according to the methodology.

CHAPTER IV

RESULTS

4.1 Participant Recruitment

The following data show the participant recruitment from each treatment unit classified by models. At the beginning, the out-patients were recruited from Chiang Mai DDTC, Thanyarak Institute and the Psychiatric Unit of Ratchaburi Provincial Hospital. Twenty-six out-patients at Chiang Mai DDTC who fitted the selection criteria were approached. Three cases refused. At Thanyarak Institute, 30 out-patients were in the criteria. Of these, 10 cases refused as they had to work/study and did not want to be followed-up. At Ratchaburi, 51 cases were approached but 10 cases did not want to participate as they lived outside the area and did not want to be followed-up. Therefore, the number of out-patients in the study who attended Matrix model was 84 cases.

As for FAST model, 54 in-patients were approached at Chiang Mai DDTC. Of these, 9 cases dropped out. Five cases refused to participate at the first approach while another 3 cases left the treatment units after the first interview and another one was not suitable for the program due to symptoms of psychosis. At Thanyarak Institute, 61 in-patients met the criteria but 12 cases refused and another two cases had symptoms of psychosis. Therefore, the number of in-patients in the study who attended FAST model was 92 cases.

Their improvement was evaluated twice, at 1.5 months and 3 months after attending the program through a questionnaire “Evaluation of self and treatment” of TCU, Institute of Behavioral Research. After attending the rehabilitation for 4 months, they were discharged. No-one in either group had to extend their treatment for more than 4 months.

The first follow-up was 30 days after discharge. There were 57 out-patients (Matrix model) and 70 in-patients (FAST model) in the first follow-up. Twenty-seven cases from the Matrix model missed their first follow-up. Of these, 10 cases could not be found at all while another 8 cases were students who were refused to be followed-

up and 5 cases went to work outside the province. Also, another one case was found for the last follow-up, he reported that he was admitted to hospital for 4 months because of an accident. As for FAST model, 22 cases missed the first follow up. Of those, 19 cases could not be contacted while another 2 cases worked outside the province and one case was sent to the probation system.

For the second follow-up at 3 months after discharge, 43 and 58 cases of Matrix model and FAST model were interviewed. The Matrix model missed 14 cases while the FAST model missed 12 cases because the patients did not stay at home and could not be contacted. In some cases, family members could not give any information about their whereabouts either.

For the third follow-up at 6 months after discharge, 45 and 47 cases of Matrix model and FAST model were found. As for FAST model, another 11 cases were missing from the second follow-up. Of these, 2 cases were taken into the probation system while another 9 cases did not stay at homes. For the out-patients or Matrix model attendances, 4 cases missed the last follow-up as one case was arrested while another 3 cases did not stay at home. The last follow-up found 6 missing cases from the first and second follow-up. Among these cases, 5 cases had jobs in Bangkok while another case had just been discharged from hospital after treatment for an accident.

Participant recruitment and follow-up outcome

	Matrix model	Missing cases/reason	Fast model	Missing cases/reason
First recruitment at treatment units				
Chiang Mai Drug Dependence Treatment Centre	23	3 cases refused	45	9 cases were excluded - 5 cases refused - 3 cases(aged 30, 29, 20 yrs) were interviewed at the first recruitment after that they escaped, - 1 case had psychosis
Thanyarak Institute	20	10 cases refused (Did not want to be followed-up)	47	14 cases were excluded -12 cases refused and - 2 cases had psychosis
Psychiatric Unit of Ratchaburi Provincial Hospital	41	10 cases refused (Lived outside area)	0	
Total participants	84		92	

Participant recruitment and follow-up outcome (cont.)

	Matrix model	Missing cases/reason	Fast model	Missing cases/reason
Evaluation of self and treatment during rehabilitation				
First evaluation (1.5 months after attending program)	84	-	92	-
Second evaluation (3 months after attending program)	84	-	92	-
Discharged after attending program for 4 months then follow-up				
First follow-up (1 month after discharge)	57	27 cases missed: -8 cases were students, not allowed by schools -3 cases were in probation system -1 case had an accident and admitted in a hospital -5 cases worked in other provinces -10 cases could not be found	70	22 cases missed: -2 cases worked outside the province -1 case was in probation system -19 cases could not be contacted
Second follow-up (3 months after discharge)	43	14 cases missed: -14 cases did not stay at home	58	12 cases missed: -12 cases did not stay at home
Third follow-up (6 months after discharge)	45	4 cases missed: -1 case was arrested -3 cases did not stay at home *6 cases from Ratchaburi came back home*	47	11 cases missed: -2 cases were in probation system -9 cases did not stay at home

4.2 General Characteristics

During October 2008-February 2009, one hundred and seventy six volunteers who attended FAST model (in-patient) and Matrix model (out-patient) were recruited from three treatment units, Thanyarak Institute, Chiang Mai Drug Dependence Treatment Centre and the Psychiatric Unit of Rachaburi Provincial Hospital. Of these, 92 cases were FAST model attendees (47 cases from Thanyarak and 45 cases from

Chiang Mai DDTC respectively) and 84 attended Matrix model (23 cases from Chiang Mai DDTC, 20 from Thanyarak and 41 cases from Ratchaburi Hospital respectively).

The general characteristics from the baseline interviews are presented below under the following four topics,

1. Comparison of participants attending Matrix and FAST models
2. Population and socio-economic characteristics
3. Environmental characteristics and methamphetamine use and
4. Other situation related to drug use

It aims to compare characteristics between participants of Matrix and FAST models at intake. The details of characteristics classified by models and treatment units are presented in the Tables in Appendix 3.

Comparison of participants attending Matrix and FAST models

Between the two models, there is no significant difference in general characteristics. Therefore, the participants of the two models (Matrix and FAST models) on recruitment can be compared. Table 1 shows their characteristics as follows:

Their mean age on admission of both groups is about the same, 23.8 years old. Most attendees are Thai except two cases from FAST model in Chiang Mai who are members of hill tribes. The majority (95-99%) of patients are Buddhist. About 68-71% are single or have never been married whereas about 1/4 are married. As for educational level, more than 45% finished secondary school while another 21-28% finished primary school. It is noticeable that the majority of patients are from the younger generation as 70-77% are offspring.

Table 1 The different characteristics between Matrix and FAST models

		Matrix model (out-patient)	FAST model (in-patient)	Chi-square/ t-test+
Age on admission	Mean	23.75	23.82	-0.077
	S.D.	5.88	5.37	
Race	Thai (%)	100.0	97.8	1.847
Religion	Buddhist (%)	98.8	94.6	2.402
Marital status	Never married (%)	71.4	68.5	0.410
	Married (%)	25.0	26.1	
Education status	Primary school (%)	21.7	28.3	1.063
	Secondary school (%)	49.4	46.7	
Household status	Head/spouse (%)	13.1	25.0	5.481
	Offspring (%)	77.4	70.7	

S.D. = Standard deviation + Non-significance

Demographic and socio-economic characteristics

This section will present a comparison of the demographic and socio-economic status between out-patients (Matrix model) and in-patients (FAST model). Some variables may be the same as the previous topics but have a different purpose (see details in Table A.3.1 in Appendix 3).

The average age on admission of Matrix and FAST model patients is similar (23.8 years old). However, if the median age is considered, the FAST model patients tend to be older than the Matrix model (24.0 vs. 22.5 years old).

More than 55% are single which corresponds to their status in the household as about 70% are offspring. Even though there are some differences in the educational level among patients in each group, the majority finished secondary school or attended 7-9 years of study (about a half or 46.7% and 48.8% of FAST and Matrix models). The median age at which patients finished school of Matrix and FAST model attendees are 15 years old.

As regards their economic characteristics, about 30% of FAST model patients are unemployed which is 10% higher than Matrix model patients. The FAST model patients' work mostly is unskilled work (28.3%) and skilled work (13.0%) while the Matrix model patients' work is unskilled work (26.2%) and students (23.8%). If only employed people are considered, their average income per month is about 7,000-

9,000 baht/month. Matrix model or out-patients earned a lower income than in-patients.

Regarding their source of extra income, about 63% of out-patients and 53% of in-patients have no extra income. However, the majority report that they have extra money from their families. Only 11% of in-patients (FAST model) and 2.4% of out-patients (Matrix model) get extra money from illegal activities. Of these, 2 cases of FAST model report stealing and 10 cases of FAST model patients and 2 cases of Matrix model patients mention they are drug pushers. The economic characteristics (occupation, income and extra-income) of the two model attendees have statistical significance (Table 2).

Table 2 Demographic and socio-economic characteristics

		Matrix model (out-patient)	FAST model (in-patient)	Chi-square/ t-test
Age finished school(yrs)	Median	15.0	15.0	
	Mean	15.48	15.52	-0.105
	S.D.	2.63	2.66	
Employment status				20.402**
Unemployed	(%)	19.0	29.3	
Skilled worker	(%)	4.8	13.0	
Unskilled worker	(%)	26.2	28.3	
Student	(%)	23.8	4.3	
Income/month[+]	Mean	6735.66	8668.00	-2.145*
	S.D.	3958.49	5083.35	
Source of extra income				15.970**
None	(%)	63.1	53.3	
Family	(%)	31.0	18.5	
Illegal job	(%)	2.4	13.0	
Legal job	(%)	3.6	15.2	
Money from extra job	Mean	2988.00	6194.87	-1.456
	S.D.	2060.20	10860.62	

[+] excluded non response and cannot be applied cannot be applied for income as they were unemployed and student, S.D. = Standard deviation

*significant at p<.05, ** significant at p<.01

Environmental characteristics

As they had to commute to the treatment centre almost every day or at least a few days a week, Matrix model patients lived in the same province or area in which the treatment unit was situated. It is noticeable that FAST model patients at Chiang Mai

DDTC came from Chiang Mai and Lumphun while those attending Thanyarak came from Bangkok and Pathumtani, an adjacent province to Bangkok. Fifty to eighty seven percent of the patients live in a single house. According to the parents' relationship, Matrix model attendees have parents with a better relationship (66.7%) than FAST model patients (46.7%). (Table A.3.2 in Appendix 3)

Regarding substance abuse among friends, more than 80% of both groups report that their friends are methamphetamine users. Cannabis is the second most mentioned substance that their friends use (15.5% and 26% of Matrix and FAST models respectively). Only FAST model attendees report that their friends use ice (*crystalline methamphetamine*). About 5% and 11% of out-patients and in-patients report that their family members use ice.

The statistics have proved the significance of the Matrix and FAST models attendees in terms of having friends using methamphetamine and cannabis ($p<.01$) while there is no statistical significance in having family members using those substances.

Table 3 Report of having friends and family members using substances/drugs comparing Matrix and FAST models

		Matrix model (out-patient)	FAST model (in-patient)	t-test
Friends use MA	Mean	3.04	7.89	-4.904**
	S.D.	2.63	8.71	
Family members use MA	Mean	1.12	1.29	-1.526
	S.D.	0.55	0.91	
Friends use cannabis	Mean	0.46	1.63	-2.702**
	S.D.	1.56	3.64	
Family members use cannabis	Mean	1.04	1.09	-0.875
	S.D.	0.33	0.44	
Friends use ice	Mean	0.02	0.53	-2.348*
	S.D.	0.22	1.98	
Family members use ice	Mean	NA	NA	
	S.D.	NA	NA	

NA = Not available

*significant at $p<.05$, ** significant at $p<.01$

Methamphetamine use and other situation related to drug use

With regard to drug use, the highest cause of the first MA use in percentage terms, 34.8% among in-patients (FAST model) and 50% among out-patients (Matrix model) are curiosity; followed by their friends' persuasion, about 29% in both models; and enjoyment, about 11% for out-patients and 4% for in-patients respectively. Other reasons, feeling depressed and enhancing to work are reported more often by FAST model patients than Matrix model.

The age at the first use of methamphetamine was about 16-18 years old. Matrix patients tend to be older (18 years compared to 16 years old). The mean ages of first MA use of FAST and Matrix models found a statistical difference ($P<.05$) about 18 and 17 years respectively. This makes the duration of drug use among in-patients 1.5 years longer than that of out-patients (6.6 vs. 5.1 years). When the amount of drug use and money spent on drugs are considered, the two model attendees used about 2-3 methamphetamine tablets a day and spent about 200-300 baht, showing no significant, statistical difference.

Their route of administration of MA is smoking. Only one case from FAST model in Chiang Mai mentions smoking and injecting. The quantity of use per time is 1-2 tablets per day and cost about 295-378 baht/day (about US$9.5-11.5). More than 87% also drink alcohol regularly. About 23% of FAST model patients have been for treatment before while only 10% of Matrix model patients are returners but attended a different model. It is worthy of note that about 26-55% report having been arrested because of drug use (see Table A.3.3 in Appendix 3).

A question of self evaluation whether the patient had any problem, with drug use or not, was explored. FAST model patients have more problems than Matrix model with statistical significance at $p<0.05$. Also, a 12-question set about level of addiction and problem, 1) Increased the quantity of drug use, 2) Tried to stop using drug but unsuccessful, 3) Used most of the time in drug purchase, used and intoxication, 4) Absented from work or school due to using drug, 5) Had accident due to using drug, 6) Used less time with friends due to using drug, 7) Drug use had lead to psychosis problems, 8) Drug use had affected family, friends and colleagues, 9) Drug use

affected health, 10) Before attending the treatment, did the drug users have to increase drug amount in order to have the same intoxication, 11) Needed to use drug to protect from withdrawal symptoms, 12) Felt uncomfortable or moody if drug user was asked to stop using drugs, or had to stop using drugs. These questions were used by a previous study (Laied Dheerarat and Usaneya Perngparn, 2004) and provided reliability at 0.84. As the scores are counted, the FAST model patients mention more problems than the Matrix patients with $p<0.01$. However, there are some questions with statistical significance at $p<0.01$, i.e. drug use affected health, before attending the treatment, did the drug users have to increase drug amount in order to have the same intoxication, needed to use drug to protect from withdrawal symptoms and felt uncomfortable or moody if drug user was asked to stop using drugs, or had to stop using drugs, tried to stop using drugs but unsuccessful has significance at $p<0.05$ (Table A.3.4 Appendix 3).

Table 4 Methamphetamine use and other situation related to drug use compared Matrix and FAST models

		Matrix model (out-patient)	FAST model (in-patient)	Chi-square/ t-test
Reason of first MA use				9.915*
Friend's persuasion	(%)	30.5	33.8	
Curiosity	(%)	51.2	40.0	
Enjoyment	(%)	11.0	5.0	
Depression	(%)	1.2	10.0	
Enhance working ability	(%)	6.1	11.3	
Age first MA use (yrs)	Median	18.0	16.0	
	Mean	18.56	17.21	2.240*
	S.D.	2.63	2.66	
Duration of using MA	Mean	5.19	6.61	-2.124*
	S.D.	4.46	4.39	
Quantity of use per day	Mean	2.92	3.22	-1.091
	S.D.	1.22	2.24	
Money spent on drug/day	Mean	294.88	323.79	-0.880
	S.D.	180.78	246.75	
Route of administration				0.918
Smoke/inhale	(%)	100.0	98.9	
Smoke and inject	(%)	0	1.1	
Drinking alcohol	(%)	91.7	92.4	0.031
Ever been treated drugs	(%)	9.5	22.9	7.953
Ever been arrested	(%)	44.0	45.6	9.595

*Significant at p<.05, ** Significant at p<.01

Table 4 Cont.

	Matrix model (out-patient)	FAST model (in-patient)	Chi-square/ t-test
Have problems with drug use?			15.657*
No	29.8	30.4	
A little	31.5	25.0	
Moderate	14.1	24.4	
Much to very much	23.9	20.4	
Level of problem from MA Mean	4.08	5.72	-3.375**
S.D.	2.97	3.41	

*Significant at p<.05, ** Significant at p<.01

4.3 Evaluation of Self and Treatment

Patients must attend the treatment model for at least 4 months. During the period of treatment rehabilitation, their improvement will be evaluated twice – at one and a half months and at three months after attending FAST and Matrix models by using the Texas Christian University (TCU) evaluation forms on self and treatment. The following presentation is the outcome from the measurement of improvement.

The evaluation includes 3 sections, A) ratings of self, B) ratings of treatment process and C) ratings of program attributes. These sections are short scales for *psychological functioning* (self-esteem, depression, anxiety, self-efficacy), *social functioning* (hostility, risk-taking, social conformity), *treatment motivation* (treatment readiness and pressures), *participation in treatment* (therapeutic engagement, personal progress, Trust group and program staff), *counsellor attitude and behaviour* (counseling rapport and competence), and *program attributes* (treatment services, peer support and social support).

The difference in improvement between Matrix and FAST models is shown in Table 5. Patients who attended Matrix model have improved in all psychological functioning scales and two social functioning scales (hostility and social conformity), with highly statistical significance. As for participation in treatment, only program staff improves with statistical significance at p=0.016. Noticeably, the FAST model attendees have not only improved ratings of self on self esteem (depression and anxiety), and social functioning scales (hostility and social conformity) but also improved in both sections of ratings treatment process and program attributes with

highly statistical significance at p=0.00-0.02. In this situation, FAST model improved more than Matrix model attendees.

Table 5 The difference in patients' improvement between Matrix and FAST models

		Paired differences between 1.5 and 3 months					t-test
		Mean	S. D.	S.E. Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Matrix Model							
SECTION A. RATINGS OF SELF							
A.1 Psychological functioning scales							
Pair 1	Self Esteem	-16.03	47.68	5.40	-26.78	-5.27	-2.97**
Pair 2	Depression	22.05	57.31	6.49	9.13	34.97	3.40**
Pair 3	Anxiety	36.92	65.85	7.46	22.08	51.77	4.95**
Pair 4	Self Efficacy	-21.54	54.13	6.13	-33.74	-9.33	-3.51**
A.2 Social functioning scales							
Pair 5	Hostility	36.79	75.41	8.54	19.79	53.80	4.31**
Pair 6	Risk Taking	-10.13	46.02	5.21	-20.50	0.25	-1.94
Pair 7	Social Conformity	-12.69	50.88	5.76	-24.16	-1.22	-2.20*
A.3 Treatment motivation scales							
Pair 8	Treatment Readiness	4.10	43.29	4.90	-5.66	13.86	0.84
Pair 9	External Pressures	3.85	54.75	6.20	-8.50	16.19	0.62
SECTION B. RATINGS OF TREATMENT PROCESS							
B.1 Participation in treatment							
Pair 10	Therapeutic Engagement	-13.59	61.81	7.00	-27.53	0.35	-1.94
Pair 11	Personal Progress	-9.23	47.39	5.37	-19.92	1.45	-1.72
Pair 12	Trust Group	-8.59	43.42	4.92	-18.38	1.20	-1.75
Pair 13	Program Staff	-13.90	49.69	5.66	-25.17	-2.62	-2.45*
B.2 Counsellor attitude and behaviour							
Pair 14	Counsellor Rapport	-13.21	81.55	9.23	-31.59	5.18	-1.43
Pair 15	Counsellor Competence	-15.00	88.68	10.04	-34.99	4.99	-1.49
SECTION C. RATINGS OF PROGRAM ATTRIBUTES							
Pair 16	Treatment Service	19.10	110.75	12.54	-5.87	44.07	1.52
Pair 17	Peer Support	-2.31	43.54	4.93	-12.12	7.51	-0.47
Pair 18	Social Support	-0.69	87.81	10.35	-21.33	19.94	-0.07
FAST Model							
SECTION A. RATINGS OF SELF							
A.1 Psychological functioning scales							
Pair 1	Self Esteem	-15.57	51.06	5.74	-27.01	-4.13	-2.71**
Pair 2	Depression	24.30	66.62	7.49	9.38	39.22	3.24**
Pair 3	Anxiety	35.06	76.54	8.61	17.92	52.21	4.07**
Pair 4	Self Efficacy	-7.85	62.81	7.07	-21.92	6.22	-1.11

S.D. = Standard deviation, S.E. = Standard error, *Significant at p<.05, ** significant at p<.01

Table 5 Cont.

		Paired differences between 1.5 and 3 months					t-test
		Mean	S. D.	S.E. Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
A.2 Social functioning scales							
Pair 5	Hostility	17.34	68.79	7.74	1.93	32.75	2.24*
Pair 6	Risk Taking	-3.92	56.76	6.39	-16.64	8.79	-0.61
Pair 7	Social Conformity	-15.32	57.35	6.45	-28.16	-2.47	-2.37*
A.3 Treatment motivation scales							
Pair 8	Treatment Readiness	-4.05	50.70	5.70	-15.41	7.31	-0.71
Pair 9	External Pressures	9.75	70.33	7.91	-6.01	25.50	1.23
FAST Model							
SECTION B. RATINGS OF TREATMENT PROCESS							
B.1 Participation in treatment							
Pair 10	Therapeutic Engagement	-22.78	57.24	6.44	-35.61	-9.96	-3.54**
Pair 11	Personal Progress	-12.41	38.74	4.36	-21.08	-3.73	-2.85**
Pair 12	Trust Group	-12.03	47.11	5.30	-22.58	-1.47	-2.27*
Pair 13	Program Staff	-12.03	43.95	4.94	-21.87	-2.18	-2.43*
B.2 Counsellor attitude and behaviour							
Pair 14	Counsellor Rapport	-34.05	69.12	7.78	-49.53	-18.57	-4.38**
Pair 15	Counsellor Competence	-33.16	79.15	8.91	-50.89	-15.43	-3.72**
SECTION C. RATINGS OF PROGRAM ATTRIBUTES							
Pair 16	Treatment Service	-28.86	99.91	11.24	-51.24	-6.48	-2.57*
Pair 17	Peer Support	-15.32	43.29	4.87	-25.01	-5.62	-3.14**
Pair 18	Social Support	-46.35	91.91	10.68	-67.65	-25.06	-4.34**

S.D. = Standard deviation, S.E. = Standard error, *Significant at p<.05, ** Significant at p<.01

4.4 Follow-Up at 1, 3 and 6 Months

After being discharged, patients will be followed-up three times at 1, 3 and 6 months respectively. Table 6 shows numbers and percentages of follow-up, missed follow-up and relapse cases. About 1/3 of Matrix model group or out-patients were missing at the first follow-up while only 24% of FAST model were missing. Among the met cases, about 10-11% had relapsed. In the second follow-up, the percentage missing follow-up increased to 39.3% and 26.1% among Matrix and FAST models. Noticeably, the percentage of missing follow-up at six months was better as 6 cases of Ratchaburi out-patients were found. Therefore, about 34% of two groups missed follow-up and total relapsed cases were 28 cases (13.1% and 18.5% of Matrix and FAST model respectively).

Table 6 Number and percentage of follow-up cases at 1, 3 and 6 months

		Matrix model		FAST model	
One month follow-up		N	(%)	N	(%)
	Missed follow-up	27	(32.1)	22	(23.9)
	Met patients (non-relapsed)	49	(67.9)	60	(76.1)
	Relapsed at 1 follow-up	8	(9.5)	10	(10.9)
Total		84	(100.0)	92	(100.0)
Three month follow-up					
	Missed follow-up	33	(39.3)	24	(26.1)
	Met patients (non-relapsed)	41	(48.8)	55	(59.8)
	Relapsed at 1 follow-up	8	(9.5)	10	(10.9)
	Relapsed at 2 follow up	2	(2.4)	3	(3.3)
Total		84	(100.0)	92	(100.0)
Six month follow-up					
	Missed follow-up	29	(34.5)	32	(34.8)
	Met patients (non-relapsed)	44	(52.4)	43	(46.7)
	Relapsed at 1 follow-up	8	(9.5)	10	(10.9)
	Relapsed at 2 follow up	2	(2.4)	3	(3.3)
	Relapsed at 3 follow-up	1	(1.2)	4	(4.3)
Total		84	(100.0)	92	(100.0)
Outcome after 6 month follow-up					
	All relapsed cases	11	(13.1)	17	(18.5)
	Abstinence	44	(52.4)	43	(46.7)

Most relapsing cases used yaba or methamphetamine, except 2 cases from FAST model and one case from Matrix model. In FAST model, one case reported sniffing glue and another one used ice with domicum (midazolam) while the case from Matrix model used ice (Table 7). After 6 month follow-up, 52.4% (44 cases) of Matrix model and 46.7% (43 cases) of FAST model attendees reported being drug free.

Table 7 Drug use among relapse cases

		Matrix model	FAST model
One month follow-up		N (%)	N (%)
	Methamphetamine	7 (63.6)	8 (47.1)
	Ice and domicum		1 (5.9)
	Glue		1 (5.9)
	Ice	1 (9.1)	
Three month follow-up	Methamphetamine	2 (18.2)	3 (17.6)
Six month follow-up	Methamphetamine	1 (9.1)	4 (23.5)
Total		11 (100.0)	17 (100.0)

The missing follow-up cases

The following tables show the comparison between the missing follow-up cases in Matrix and FAST models. Following the t-test in Table 8, five characteristics, age on admission, age at first MA use, marital status, education status and household status are compared. It is found that there is no difference in characteristics between the two models.

Only some differences in characteristics in missing follow-up cases in the two models at the first (one month) and second (3 months) follow-ups have been found. Of high significance ($p<.01$) is the number of yaba tablets used per day and the income per month. In-patients (Fast model) tended to use higher amounts of MA than out-patients (Matrix model). Also, in-patients (FAST model), who missed follow-up at the first and second rounds are the cases that earn more income than out-patients ($p<.05$). The patients who missed the third follow-up show a more significant difference in money spent on drugs per day between in-patients and out-patients ($p<.05$) (see detail in Table A.3.5 in Appendix 3).

The Chi-square test of all follow-ups which compared Matrix and FAST models shows no difference in other characteristics, except employment status. The missing follow-up cases show a highly significant difference ($p<.01$) of employment status between Matrix and FAST models. The significant findings in the missing cases in income and employment status are the same significant characteristics found in the baseline data while money spent on drugs is different.

Table 8 The missed followed-up 1, 3 and 6 months comparing between out-patients (Matrix model) and in-patients (FAST model)

		Follow up	Matrix model (out-patient)	FAST model (in-patient)	Chi-square/ t-test
Age on admission	Mean	First	22.48	23.64	0.481
	(S.D.)		5.57	5.21	
	Mean	Second	21.85	24.13	0.006
	S.D.		5.35	5.29	
	Mean	Third	21.14	24.13	0.050
	S.D.		4.90	5.03	
Age at first MA use	Mean	First	18.00	17.59	1.090
	S.D.		3.86	4.93	
	Mean	Second	17.97	17.75	1.527
	S.D.		3.69	4.80	
	Mean	Third	17.48	17.16	1.940
	S.D.		3.01	4.30	
Money spent on drug	Mean	First	259.63	299.55	3.055
	S.D.		112.44	170.34	
	Mean	Second	254.24	293.33	2.876
	S.D.		110.68	165.60	
	Mean	Third	253.10	426.25	6.887*
	S.D.		127.45	448.00	
Marital status	Never married (%)	First	81.5	68.2	1.16
	Married (%)		18.5	31.8	
	Never married (%)	Second	81.8	62.5	2.674
	Married (%)		18.2	37.5	
	Never married (%)	Third	75.9	68.8	0.383
	Married (%)		24.1	31.3	
Education status	Primary school (%)	First	22.2	36.4	1.217
	Secondary school (%)		63.0	50.0	
	Primary school (%)	Second	18.2	37.5	3.032
	Secondary school (%)		66.7	45.8	
	Primary school (%)	Third	20.7	58.6	1.452
	Secondary school (%)		58.6	46.9	
Household status	Head/spouse (%)	First	18.5	22.7	0.132
	Offspring (%)		81.5	77.3	
	Head/spouse (%)	Second	18.2	29.2	0.952
	Offspring (%)		81.8	70.8	
	Head/spouse (%)	Third	20.7	25.0	0.160
	Offspring (%)		79.3	75.0	
Employment status	Unemployed (%)	First	14.48	36.4	9.926**
	Student (%)		33.3	0	
	Unemployed (%)	Second	12.1	37.5	13.880**
	Student (%)		39.4	0	
	Unemployed (%)	Third	13.8	37.5	20.515**
	Student (%)		48.3	0	

S.D. = Standard deviation, *Significant at p<.05, ** Significant at p<.01

Comparison between the missing follow-up and found cases

The following analysis in Table 9 aims to compare general characteristics between the missing follow-up cases and found cases. Even though the average age on admission, age at first MA use, and money spent on drugs have a higher rate in found cases than in the missing cases, there is no significant difference. Also, there was no difference in other characteristics – marital status, education status, household status and employment status. This data show that the found cases are representative of the participant group.

Table 9 The baseline characteristics comparing between missing follow-up and found cases

		Missed follow-up (43 cases)	Found cases (133 cases)	Chi-square/ t-test[+]
Age on admission	Mean	22.84	24.09	-1.276
	S.D.	5.26	5.70	
Age first MA use	Mean	17.51	17.96	0.527
	S.D.	4.12	4.03	
Money spent on drug	Mean	277.91	320.37	-1.113
	S.D.	149.48	235.04	
Marital status	Never married (%)	72.1	69.2	2.748
	Married (%)	27.9	24.8	
Education status	Primary school (%)	30.2	23.5	3.320
	Secondary school (%)	53.5	46.2	
Household status	Head/spouse (%)	18.7	19.5	2.417
	Offspring (%)	76.7	72.9	
Employment status	Unemployed (%)	27.9	23.3	3.567
	Student (%)	20.9	11.3	
Income/month	Mean	8133.33	7742.51	0.340
	S.D.	4812.31	4700.50	

S.D. = Standard deviation, + Non-significance

The follow-up outcomes

The first follow-up at one month

The following outcomes of all follow-up are shown in Table 10. After the patients had been discharged for one month, they were followed-up to monitor the situation of their drug use - whether they still refrained from using illegal drugs or not, their health and social functions. The questionnaire used is in appendix 2. Fifty seven cases and seventy cases of the Matrix and FAST models are followed-up. More than

75% and 68% of Matrix and FAST models are offspring. FAST model attendees are more likely to be employed than Matrix model (67% and 60% respectively) although the statistic shows non-significance. It also found a slight difference in that 19.3% of Matrix model (out-patient) are students while only 5.7% of FAST model (in-patient) are students.

About 10% or eighteen cases, 8 cases from Matrix model and 10 cases from FAST model had relapsed at first follow-up. Among those relapses, 3 cases report using glue, ice and ice with domicum while the others use yaba or methamphetamine. With regard to drinking alcohol, about 1/3 of both groups report not drinking at all; about 20% drink more than three times a week (Table 7).

Questions about antisocial behaviour including illegal activities, are asked. The questions are whether they have sold drugs, stolen money or things from family, stolen money or things from other persons and quarreled with people. About 4-6% of Matrix and FAST model cases reported that they are drug pushers. Not many cases reported stealing money or things from family and others. And 4-10% reported that they have quarreled with others.

About 75% of both groups mentioned they have better health at present. The physical health of FAST model attendees tends to be better than Matrix model attendees while other sickness was reported by 92%.

When behaviour (helping with family chores, earning some money, taking care of family, and staying at home) are considered, some significant difference has been found between Matrix and FAST model attendees. The percentage of FAST model attendees reported they are better at helping with family chores and earning some money with statistical significance at $p<0.05$ and $p<0.01$ respectively while other habits show no difference.

The second follow-up at three months

At the three-month follow-up, another 6 cases of Matrix model and 2 cases of FAST model were missing. Among the found group, another 5 cases reported that they have used MA. When comparing the found cases' general characteristics at interview

between FAST (58 cases) and Matrix models (43 cases) there was no statistical difference. This is similar to the findings at the first follow-up. About 70-79% are offspring. FAST model attendees reported that they are employed (69%) which is about 10% higher than Matrix attendees. Rate of non-drinking alcohol is about 30%.

Reports of antisocial behaviour, are broadly the same as at the first follow-up. Less than 5% have stolen money from their family but they do not steal money from others. Also, about 5-12% have quarreled with people. As for their health improvement, they reported good health in general, 74% and 62% of Matrix and FAST model attendees. Only 2-8% mentioned feeling weak because of drug use.

Concerning their health at the interview, FAST model attendees reported a lower rate of improvement in general health than those in the last follow-up and lower than those in the Matrix attendees. The same response was given for physical health.

As regards their behaviour, Matrix model attendees have a higher percentage than FAST model attendees, especially taking care of family (63.4% and 32.7% compared between Matrix and FAST models) and general behaviour (85.4% and 52.7% compared between Matrix and FAST models). This report has a highly significant difference at $p<0.01$. Staying at home every day yields a difference of more than 20% (80.5% and 60.0% compared between Matrix and FAST models) and it is almost significant ($p=0.055$).

The third follow-up at six months

The last follow-up, 45 and 47 Matrix and FAST model attendees are found. As mentioned earlier, 4 cases of Matrix model were missing and 6 cases missed at the first follow-up have been found. Matrix attendees from Ratchaburi Provincial Hospital missed at 1 and 3 months follow-up because five cases work outside of the provincial area and one case was in the hospital. Of these met cases, 5 (1 and 4 cases from Matrix and FAST models) are relapsed. Therefore, there are 87 cases (44 and 43 cases of Matrix and FAST model) still abstinent at 6 months.

According to the general characteristics of found cases, family status has changed from the first and second follow-up as the percentage of meeting with offspring is decreased (48.9% and 66.0% in Matrix and FAST model respectively). In addition, the percentage of employment has increased in both models when compared to the first and second follow-up (62.2% and 72.3% in Matrix and FAST model respectively). Percentage of drinking alcohol sometimes (less than 3 times a week) is higher among Matrix model attendees than FAST model attendees (62.2% and 44.7%).

Noticeably, the rate of antisocial behaviour such as stealing money, selling drugs and quarreling with other people has disappeared or is less than the previous follow-up. As for their health improvement, they reported good health in general, (72.1% and 55.3% of Matrix and FAST model attendees). Regarding the improvement in behaviour, Matrix model attendees have improved in taking care of family ($p<0.01$), earning money and staying at home ($p<0.05$).

Table 10 The found cases comparing between Matrix and FAST models at 1, 3 and 6 months follow-up

	First follow-up (one month)		Chi-square	Second follow-up (3 months)		Chi-square	Third follow-up (6 months)		Chi-square
	Matrix Model	FAST Model		Matrix Model	FAST Model		Matrix Model	FAST Model	
Total number	57	70		43	58		45	47	
Family status	(%)	(%)		(%)	(%)		(%)	(%)	
Offspring	75.4	68.6	0.729	79.1	70.7	0.907	48.9	66.0	2.743
Others	24.6	31.4		20.9	29.3		51.1	34.0	
Employment status	(%)	(%)		(%)	(%)		(%)	(%)	
Unemployed	21.1	27.1	5.662	25.6	24.1	2.466	24.4	19.1	1.138
Employed	59.6	67.1		58.1	69.0		62.2	72.3	
Student	19.3	5.7		16.3	6.9		13.3	8.5	
During the last 30 days before the interview, have you drunk alcohol? (%)									
No	33.3	30.0	0.697	32.6	27.6	0.765	24.4	27.7	3.704
LE 3 times/week	45.6	52.9		39.5	48.3		62.2	44.7	
GT 3 times/week	21.1	17.1		27.9	24.1		13.3	27.7	
During the last 30 days, have you ever done the following habits?									
Sale drugs	(%)	(%)		(%)	(%)		(%)	(%)	
No	96.5	94.3	0.676	100.0	100.0	NA	100.0	100.0	NA
Stolen money or things from family									
No	96.5	92.9	3.203	95.3	96.6	0.094	100.0	97.9	0.861
Stolen money or things from family									
No	96.5	92.9	3.203	95.3	96.6	0.094	100.0	97.9	0.861

Table 10 Cont.

	First follow-up (one month)		Chi-square	Second follow-up (3 months)		Chi-square	Third follow-up (6 months)		Chi-square
	Matrix Model	FAST Model		Matrix Model	FAST Model		Matrix Model	FAST Model	
Stolen money or things from others									
No	98.2	97.1	0.839	100.0	100.0	NA	100.0	100.0	NA
Quarreled with others									
No	96.5	90.0	4.762	95.3	87.9	1.674	97.5	93.6	0.743
At present, how is about your health?									
General health	(%)	(%)		(%)	(%)		(%)	(%)	
Better	75.0	75.4	1.765	74.4	62.1	1.712	72.1	55.3	3.267
Same	25.0	21.7		23.3	34.5		27.9	42.6	
weak	0.0	2.9		2.3	3.4			2.1	
Physical health	(%)	(%)		(%)	(%)		(%)	(%)	
Better	44.6	58.2	5.716	32.6	48.3	5.394	30.2	45.7	11.795**
Same	53.6	34.3		65.1	43.1		69.8	39.1	
weak	1.8	7.5		2.3	8.6		0.0	15.2	
Total number	57	70		43	58		45	47	
Other sickness	(%)	(%)		(%)	(%)		(%)	(%)	
None	94.5	92.2	0.262	97.6	90.9	1.848	97.7	82.2	5.718*
Sometimes	5.5	7.8		2.4	9.1		2.3	17.8	
After discharged, have you done the following work..?									
Helping family chore	(%)	(%)		(%)	(%)		(%)	(%)	
Better	41.7	33.8	2.523	43.9	36.4	3.355	46.7	42.6	6.184
Same	54.2	53.8		53.7	50.9		53.3	44.7	
Less	4.2	12.3		2.4	12.7		.0	12.8	
Earning some money	(%)	(%)		(%)	(%)		(%)	(%)	
Better	43.8	41.5	3.204	43.9	43.6	5.005	46.7	51.1	6.017*
Same	54.2	47.7		56.1	45.5		53.3	38.3	
Less	2.1	10.8		.0	10.9		.0	10.6	
Taking care of family	(%)	(%)		(%)	(%)		(%)	(%)	
Better	58.3	32.3	7.701*	63.4	32.7	9.611**	62.2	36.2	9.174**
Same	35.4	55.4		34.1	56.4		37.8	53.2	
Less	6.3	12.3		2.4	10.9		.0	10.6	
General habit	(%)	(%)		(%)	(%)		(%)	(%)	
Better	79.2	49.2	10.509**	85.4	52.7	11.264**	88.9	55.3	13.280**
Same	16.7	41.5		12.2	40.0		11.1	38.3	
Less	4.2	9.2		2.4	7.3			6.4	
Stay at home	(%)	(%)		(%)	(%)		(%)	(%)	
Everyday	72.9	55.4	4.457	80.5	60.0	5.212	85.7	61.7	7.041*
Not at home	27.1	41.5		19.5	36.4		14.3	34.0	
Sometimes	.0	3.1		.0	3.6		.0	4.3	

*Significant at p<.05, **Significant at p<.01

4.5 Abstinence and Non-abstinence

Abstinence and non-abstinence cases compared between Matrix and FAST models

Even though the relapse case numbers are quite small, the comparison between abstinence and non-abstinence must be presented. Table 11 shows no difference in general characteristics of non-abstinence and abstinence Matrix (out-patient) and FAST (in-patient) models. As for relapse cases compared between Matrix and FAST models, about 72-82% report never been married, 45-53% finished secondary school and 54-71% have offspring status. The average age on admission and percentage of unemployment of Matrix and FAST model attendees are different but the t-test shows only marginal significance. The non-relapse cases also show no difference between Matrix and FAST models. As there are more cases in this group, the general characteristics as age on admission, marital status, education status, household status and employment have found no statistical significance.

Table 11 Relapse and non-relapse cases compared between Matrix and FAST models

		Matrix model (out-patients)	FAST model (in-patients)	Chi-square/ t-test[+]
Relapse cases				
Age on admission	Mean	26.82	22.76	1.796
	S.D.	5.980	5.739	
Marital status	Never married (%)	72.7	82.4	0.368
	Married& others (%)	27.3	78.6	
Education status	Primary school (%)	9.1	29.4	2.939
	Secondary school (%)	45.5	52.9	
Household status	Head/spouse (%)	45.5	29.4	0.749
	Offspring (%)	54.5	70.6	
Employment status	Unemployed (%)	9.1	41.2	0.370
	Student (%)	0	0	
Non-relapse cases				
Age on admission	Mean	24.7	24.0	0.563
	S.D.	5.92	5.55	
Marital status	Never married (%)	75.0	74.4	0.004
	Married& others (%)	25.0	25.6	
Education status	Primary school (%)	25.6	23.3	0.085
	Secondary school (%)	44.2	44.2	
Household status	Head/spouse (%)	18.2	32.6	2.379
	Offspring (%)	81.8	67.4	
Employment status	Unemployed (%)	25.0	18.6	1.155
	Student (%)	13.6	9.3	

[+] Non-significance

Comparing relapse and non-relapse cases

As the above analysis shows there is no statistical difference in abstinent and non-abstinent cases between Matrix and FAST models, the following analysis will compare the improvement of the abstinent and non-abstinent cases. The following data show the relapse and non-relapse cases found by models and treatment units. Only 28 cases are relapse. FAST model attendees tended to relapse more than Matrix model attendees, 28.3% and 20.0% respectively but there is no statistical significance (Table 12). All relapse cases, 15, 11 and 2 cases are from Chiang Mai DDTC, Thanyarak Institute and Ratchaburi Provincial Hospital respectively. The found cases who reported that they abstained until the last day of follow-up, mostly 6 months or 180 days, were about a half each from Matrix (out-patient) and FAST (in-patient) model attendees. As regards the treatment units, 29, 27 and 31 cases are from Chiang Mai DDTC, Thanyarak Institute and Ratchaburi Provincial Hospital respectively. If the first recruitment cases (68, 67 and 41 cases respectively) are considered, the highest percentage of abstinence is the attendees from Ratchaburi hospital followed by Chiang Mai DDTC and Thanyarak Institute respectively.

Table 12 Models and treatment units comparing the non-relapse and relapse cases

	Case found with relapse or not				Chi-square
	No		Relapse		
	N	%	N	%	
Model					
Out-patient (Matrix) N=55	44	80.0	11	20.0	1.082
In-patient (FAST) N=60	43	71.7	17	28.3	
Treatment centre					
Chiang Mai DDTC	29	33.3	15	53.6	9.623**
Thanyarak Institute	27	31.0	11	39.3	
Ratchaburi Hospital	31	35.6	2	7.1	
Total	87	100.0	28	100.0	
Model attendees					10.583**
Matrix model (Ratchaburi hospital)	31	35.6	2	7.1	
FAST model (Chiang Mai-Thanyarak)	43	49.4	17	60.7	
Matrix model (Chiang Mai-Thanyarak)	13	14.9	9	32.1	
Total	87	100.0	28	100.0	

*Significant at p<.05, **Significant at p<.01

The following presentations are the comparison between relapse and non-relapse cases among the found Matrix and FAST model attendees.

Table 13 shows the general characteristics of non-relapse and relapse cases which are the same. For instance, age on admission mean is about 24.4 years old, age at first drug use is 18 years old, amount of drug use is about 1-2 tablets at 290-390 baht/day. It is noticeable that the amount they spent on drugs per month is almost equal to their income per month. The duration of drug use is about 3.5 years before the treatment showing no different between relapse and non-relapse cases.

As for nominal scale characteristics, statistical tests found no significant difference in employment status even though the percentage of employment among non-relapse cases was higher than relapse cases (71.4% and 66.7% respectively). About 75% of both relapse and non-relapse cases reported drinking alcohol. However, the majority drink about 3 times per week. As regards the improvement of behaviour, the non-relapse cases have improved in general health, physical health, taking care of family, general habits and staying at home with significant statistical difference at $p<0.01$ (Table 14).

Table 13 General characteristics compared between relapse and non-relapse cases

Group Statistics	Case found with relapse or not	N	Mean	Std. Deviation	Std. Error Mean	t-test[+]
Age on admission	No	87	24.356	5.716	0.613	-0.001
	Relapse	28	24.357	6.069	1.147	
Age first use	No	87	18.172	4.359	0.467	0.149
	Relapse	28	18.036	3.737	0.706	
Income/month	No	57	7194.316	4020.275	532.498	-1.511
	Relapse	20	9089.000	6648.823	1486.722	
MA used per day	No	85	1.706	1.785	0.194	-0.521
	Relapse	28	1.929	2.433	0.460	
Money spent on drug/day	No	87	292.977	220.639	23.655	-1.556
	Relapse	28	369.286	241.061	45.556	
Duration of drug use	No	87	3.563	1.723	0.185	0.150
	Relapse	28	3.500	2.009	0.380	

[+] Non-significance

Table 14 Improvement compared between relapse and non-relapse cases

	Case found with relapse or not				Chi-square
	No		Relapse		
	N	(%)	N	(%)	
Employment status					
Unemployed	19	(21.8)	8	(28.6)	3.777
Student	10	(11.5)	0	(0.0)	
Employed	58	(66.7)	20	(71.4)	
Total	87	(100.0)	28	(100.0)	
Drinking alcohol					
Not drink	23	(26.4)	7	(25.0)	1.535
Less than 3 days/week	46	(52.9)	18	(64.3)	
Everyday	18	(20.7)	3	(10.7)	
Total	87	(100.0)	28	(100.0)	
General health					
Better	55	64.7	9	34.6	10.152**
Same	29	34.1	14	53.8	
Worse	1	1.2	3	11.5	
Total	85	100.0	26	100.0	
Physical health					
Very good	34	40.5	7	25.9	14.222**
Same	45	53.6	10	37.0	
Weak	5	6.0	10	37.0	
Total	84	100.0	27	100.0	
Sickness					
Not at all	76	91.6	21	91.3	0.002
Yes, not related to drug	7	8.4	2	8.7	
Total	83	100.0	23	100.0	
Helping family chore					
Same	43	49.4	16	59.3	3.622
Better	38	43.7	7	25.9	
Less	6	6.9	4	14.8	
Total	87	100.0	27	100.0	
Earning money					
Same	39	44.8	16	59.3	3.761
Better	43	49.4	8	29.6	
Less	5	5.7	3	11.1	
Total	87	100.0	27	100.0	
Taking care family					
Same	39	44.8	14	51.8	17.781**
Better	45	51.7	5	18.5	
Less	3	3.5	8	29.6	
Total	87	100.0	27	100.0	

*Significant at p<.05, **Significant at p<.01

Table 14 Cont.

	Case found with relapse or not				Chi-square
	No		Relapse		
	N	(%)	N	(%)	
General habit					
Better	65	74.7	7	25.9	23.546**
Same	20	23.0	14	51.9	
Less	2	2.3	6	22.2	
Total	87	100.0	27	100.0	
Stay at home?					
Everyday	62	73.8	9	33.3	15.585**
Not at home	20	23.8	18	66.7	
Sometimes	2	2.4	0	0.0	
Total	84	100.0	27	100.0	

*Significant at p<.05, **Significant at p<.01

Duration of abstinence

Following the study process, discharged patients of both models were followed up at 1, 3 and 6 month intervals respectively. It is expected that the differences in outcomes found in the FAST and Matrix models will be due to the model itself. However, the follow-up cases were not always found at every period, e.g. some cases were met all 3 times while some cases were met only the first time etc. In addition, relapse cases were not followed at the next interval. The exact day of first illegal substance use was asked from every relapse case. Therefore, the result of this variation in follow-up uses survival analysis. The considered variable is duration of abstinence comparing between Matrix model (out-patients) and FAST model (in-patients). The Cox-regression analysis yields no significant difference between the Matrix and FAST models. The survival function graph shows as follows:

Figure 1 The survival function graph comparing Matrix model (out-patients) and FAST model (in-patients)

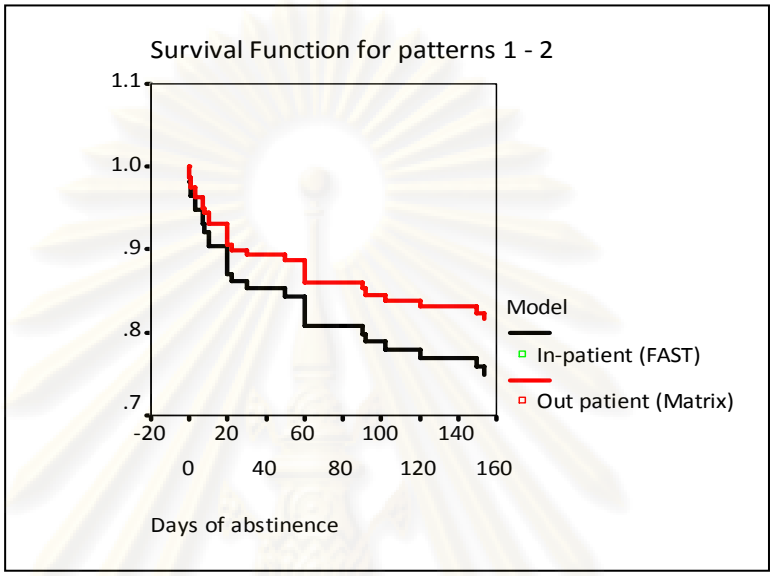


Table 15 Statistical significance and variable in the equation of treatment models (programs) and duration of abstinence

15.1 Omnibus Tests of Model Coefficients(a,b)

-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
	Chi-square	df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
264.856	.815	1	.367	.824	1	.364	.824	1	.364

a Beginning Block Number 0, initial Log Likelihood function: -2 Log likelihood: 265.680
b Beginning Block Number 1. Method = Enter

15.2 Variables in the Equation

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
PROGRAM	-.348	.387	.807	1	.369	.706	.331	1.508

When the treatment units (Chiang Mai DDTC, Thanyarak Institute and the psychiatric unit in Ratchaburi provincial hospital) were put into the analysis by using Ratchaburi as a base, it is found that the treatment units have statistical significance at $p<0.05$.

Comparing Chiang Mai DDTC to Ratchaburi hospital shows a big difference with significant difference at p=0.017 while Thanyarak Institute shows a slightly different significance at p=0.056 (Figure 2).

When general characteristics (age, education status, marital status and household status) and models are considered, using Ratchaburi treatment unit as the baseline, other treatment units, especially Chiang Mai DDTC, show significance at $p<0.05$. Therefore, it is the treatment units that show the difference, not the models (Matrix and FAST models). (see Appendix 4)

Figure 2 The survival function graph comparing between Treatment Units

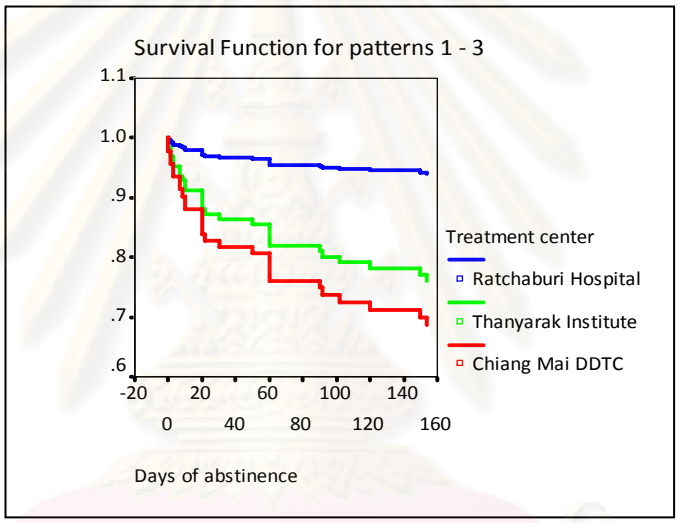


Table 16 Statistical significance and variable in the equation of treatment units and duration of abstinence

16.1 Omnibus Tests of Model Coefficients(a,b)

-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
	Chi-square	df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
257.011	7.089	2	.029	8.669	2	.013	8.669	2	.013

a Beginning Block Number 0, initial Log Likelihood function: -2 Log likelihood: 265.680
b Beginning Block Number 1. Method = Enter

16.2 Variables in the Equation

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
PLACE			5.739	2	.057			
PLACES5(1)	1.792	.753	5.659	1	.017	6.002	1.371	26.279
PLACES5(2)	1.472	.769	3.661	1	.056	4.357	.965	19.678

The following tables show the survival function graph comparing Treatment Units when general characteristics and models are controlled. Only treatment units show high significance at p=0.023, especially the place 1 (Chiang Mai DDTC) is different where place 3 (Ratchaburi hospital) counts as a baseline at 11.485 times while Thanyarak is different only 7.115 times respectively.

Table 17 Statistical significance and variable in the equation of treatment units, duration of abstinence and other demographic characteristics

17.1 Omnibus Tests of Model Coefficients (a,b)

-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
	Chi-square	df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
252.440	11.348	7	.124	12.746	7	.079	12.746	7	.079

a Beginning Block Number 0, initial Log Likelihood function: -2 Log likelihood: 265.186
b Beginning Block Number 1. Method = Enter

17.2 Variables in the Equation

	B	SE	Wald	df	Sig.	Exp(B)
Age on admission (AGE)	.021	.036	.339	1	.560	1.021
Education status (EDURECOD)	-.272	.278	.960	1	.327	.761
Marital status (MARITAL)	-.742	.563	1.738	1	.187	.476
Household status (HHSTGR)	-.534	.495	1.164	1	.281	.586
Models	-.718	.475	2.284	1	.131	.488
PLACE			7.570	2	.023	
PLACES5(1)	2.441	.888	7.557	1	.006	11.485
PLACES5(2)	1.962	.839	5.467	1	.019	7.115

In summary, this chapter has presented the outcomes of the study. It is classified into five topics, participant recruitment and outcomes, general characteristics, evaluation of self and treatment, follow-up at 1, 3 and 6 months, abstinence and non-abstinence**.** The first topic is about the method of recruitment and sample sizes in the models and at each stage, baseline, the attendance of the rehabilitation models and the follow-up at 1, 3 and 6 months. Voluntary male patients, aged 15-35 years were recruited from three Government treatment units: Thanyarak Institute, Chiang Mai DDTC and Ratchaburi Provincial Hospital. The sample size obtained was 84 and 92 cases from Matrix and FAST models respectively. A series of questionnaires derived from 2 sources, TCU correctional outpatient forms and Laied Dheerarat and Usaneya Perngparn (2004), "An evaluation of drug dependence treatment in Thailand" were used for the patients' assessment and follow-up at each stage. The second topic presents the demographic, socio-economic characteristics of participants including their environment that might lead to drug/substance use, and drug use history and other behaviour. It is found that the Matrix and FAST models have no difference in demographic characteristics, environment and behaviour. The third topic presents the outcomes of treatment evaluation which found that the FAST model (in-patient) attendees have improved in psychological functioning, participation in treatment, counsellor attitude and behaviour and program attributes while the Matrix model (out-patient) attendees have only improved in psychological functions. The fourth topic is about the follow-up outcomes at 1, 3 and 6 months. The missing cases and found cases of both models have no statistical difference in demographic characteristics. The last topic presents the abstinence difference between Matrix and FAST models. It is found that the treatment rehabilitation models have no statistical difference in terms of rate and days of abstinence.

CHAPTER V

CONCLUSION AND DISCUSSION

5.1 Conclusion

Since 1995, the epidemic of illicit stimulant use with methamphetamine as the main constituent part has become a more serious problem than heroin. HIV infection and other health problems, such as high rates of sexually transmitted infection have also been found among MA users. Therefore, treatment of the MA dependents is essential. The process of treatment, both in-patient and out-patient includes preparation, detoxification, rehabilitation and follow-up. The rehabilitation stage is intended to change the patients' behaviour after they become drug free. Most rehabilitation programs in the treatment centres provide a variety of therapies, such as cognitive behaviour therapy, self-help, 12-step of NA and others. During the period of the heroin epidemic, the therapeutic community (TC) rehabilitation model was widely used for in-patient treatment. Later on the treatment system was changed to serve the MA dependents by adopting Matrix model, originally developed by UCLA, USA to treat drug dependents. While Matrix model was being adopted, Thanyarak Institute transformed the TC's, to FAST model (F - Family, A – Alternative treatment activities, S – Self-help and T – Therapeutic community) with an expected duration from 12-18 months to 4 months serving a large demand for MA in-patients. However at present, there is no evaluation or assessment of MA treatment rehabilitation among those models in Thailand.

This project is designed to assess the outcomes (rate and duration of abstinence from illegal substance and good quality of life) of the treatment rehabilitation program run by the Drug Dependence Treatment Centres (DDTCs) comparing in-patients who attended FAST model, a unique model in Thailand, and out-patients who received Matrix model. Furthermore, it is expected to monitor and evaluate the patients' improvement after leaving the programs. Three Government study sites, Thanyarak Institute, Chiang Mai DDTC and the psychiatric unit at Ratchaburi Provincial Hospital were used to recruit the patients. Males, aged 15-35, using MA and currently attending either Matrix or FAST models were approached at the

treatment units. They were informed of the process of the research, that is, an agreement to be interviewed 6 times, the baseline assessment, measurement of improvement 2 times, 1.5 and 3 months during the rehabilitation and follow-up at 1, 3 and 6 months after being discharged.

One hundred and seventy six participants, 84 and 92 cases from Matrix and FAST models were recruited. At the baseline assessment, it was found that some characteristics of the two models were different such as employment status, income per month and source of extra income. Also, the drug use history, age at first MA use and reason of first MA use showed differences. The FAST model attendants tend to have more problems than those of Matrix model. For instance, they were unemployed, had used MA about 2 years longer and reported higher levels of problems from MA use than those in the Matrix model.

During attendance at the rehabilitation program, the Matrix and FAST model attendants reported different types of improvement. The Matrix model out-patients improved in psychological functioning scales and some parts of social functioning scales while the FAST model in-patients improved in some parts of psychological functioning scales, social functioning scales and ratings of treatment process and program attributes.

After being discharged, 115 cases were found after the 6 month follow-up. Of these, 44 and 43 cases of Matrix and FAST model attendants respectively had remained abstinent while 11 and 17 cases of Matrix and FAST models had relapsed. The rate and duration of abstinence showed no statistical difference between Matrix and FAST models. However, a difference between the treatment units was found.

The patients who missed the follow up in the two models showed no difference from the patients who attended the follow-up. This proves that the remaining subjects were still representative of the total sample. Comparing the relapse and non-relapse cases with general characteristics, such as age on admission, employment status, income etc. there is no statistical difference. However, a difference was found in general behaviours. The non-relapse cases were better in reporting their behaviours, taking care of family, general habits and staying at home and their health in general.

According to the results, Matrix and FAST models which gave an opportunity to drug users to readjust their lives in the community with other people, have proved more or less some effectiveness despite the rate and duration of abstinence. Meanwhile, for sustainability in eradicating drug problems, some services should be provided for rehabilitation attendants as well as community acceptance. In addition to the treatment system, other alternatives like prevention programs should be attentively regarded.

5.2 Discussion

This study is an assessment of drug dependence treatment rehabilitation models which are widely used for methamphetamine dependents in Thailand, Matrix model for out-patients and FAST model for in-patients. The rate and duration of abstinence including the recovery during treatment rehabilitation and the improvement after discharge from the treatment centres for six months are the main measurement. The discussion herewith will be in three categories, the model difference, the treatment factors and its relation and the national agenda concession.

***The differences of Matrix and FAST models*:**

According to the study models, Matrix model is developed for cognitive behaviour therapy while FAST model is an adjustment from the therapeutic community (TC) model which is used in many countries. TC was provided in Thailand for heroin treatment rehabilitation but it was transformed to FAST model when methamphetamine or illicit stimulants became the major problem. This is due to the political pressure (War on Drug, 2003) to eradicate methamphetamine users and the decision that a 12-18 months treatment period at TC was too long if they wanted more numbers of dependents to go through the treatment. Thanyarak Institute was ordered to work on the transformation. Some activities in TC were condensed to a shorter period and some activities especially the family session were added. Also, the Matrix model, adopted from the USA could not be completely implemented as there was no trial to adjust for Thai culture. For instance, the section of narcotics anonymous (NA), where during the group session every member was asked to reveal their drug use problem or confess if the member had reused MA. This activity is

unusual for Thai people to reveal their secrets to the strangers (members in the therapy group might not be their friends). After "War on Drug", the Matrix model was implemented across the whole country. The Ministry of Public Health provided some money (about 3,000 Baht/patient) to treatment units for every patient who attended Matrix model. In addition, the providers of Matrix model should have experience of psychotherapy but at that time there were not many psychotherapists in Thailand. The nurses in psychiatric units had to work on the Matrix model before training on the Matrix model had been organized for all treatment providers in the country (Interview information from Thanyarak and Ratchaburi staff).

Therefore, the main activity of FAST model emphasized changing behaviour and environment while Matrix model is a cognitive behaviour therapy. In addition, Matrix and FAST models have different terms of out-patient and in-patient. The decision to send patients to Matrix or FAST model is not based on scientific assessment such as level of addiction, duration of use, patient's characteristics etc., but it is from the decision of the patient himself or the family. If the patient has time to stay in the treatment centre, he will be sent to FAST model. If the patient is a student or has other commitments, he will be sent to Matrix model. According to the informal discussion with some staff at treatment units, they disclosed the following:

> "Some patients, especially in-patients will be informed about the two rehabilitation models, Matrix and FAST models. Then they can choose a suitable treatment for them. Some patients were sent on the probation system. However, the first requirement is FAST model if we have available spaces" (Ms. UW, a nurse at Thanyarak Institute)

> "One reason that we provide Matrix model is we receive money per head by the Probation Department. However, we must keep the quality of rehabilitation therapy. If it is overloaded and the patients won't get the benefit, we will refuse to have them in the group." (Ms. SL, a nurse and psychotherapist at Ratchaburi Provincial Hospital)

The findings in this research show some different characteristics of patients or drug users. For instance, FAST model patients are unemployed while Matrix model

patients are students. Matrix model attendants started using drugs at an older age than FAST model. This makes the duration of drug use among FAST model attendants 1-2 years longer than Matrix model attendants. FAST model patients reported that their drug use caused more problems than Matrix model with statistical significance at $p<0.05$. This is consistent to the indirect question, a 12-question set about the level of addiction showing the score count, the FAST model patients have more problems than the Matrix patients with high significance at $p<0.01$. All these outcomes not only show the differences between the two models but also show the FAST model patients tended to be more addicted to MA than those of Matrix model.

As mentioned, Matrix model and FAST model provide a different rehabilitation therapy. The study shows patients who attended Matrix model improved in all psychological functioning scales while FAST model improved in sections of ratings treatment process and program attributes.

Although the duration of attending the full program in the two models is more than 4 months, Matrix and FAST models in Thailand discharge patients at 4 months. The Matrix model attendants will be asked to attend *Second Phase* – After Care Program once a week. This is applicable only to voluntary cases not compulsory cases. The compulsory cases will be taken care of by the probation system. Also, as for the FAST model patients, the full duration of the program can be a year but it is for those drug users with the severest dependency problems. Many studies from other countries (Hser *et al*., 1999, Gossop *et al*., 1999, Rawson *et al*., 2004) mentioned how longer retention could give longer periods of abstinence. The Matrix and FAST model attendants in this project cannot be compared in terms of retention difference as most in and out-patient participants were discharged at 4 months. Although the out-patients needed a confirmed negative urine test before discharge, in this study only two cases from Ratchaburi hospital reached that point. So, they were discharged a week late after completing 4 months.

A fundamental question underlying the discussion of treatment effectiveness is whether patients show changes in their drug use and other problem behaviours

after treatment. In this project, one of the most important general findings is that the patients who entered FAST and Matrix models have no statistically significant difference relapse rates when comparing duration of abstinence period and percentage of non-relapse after 1, 3 and 6 month follow-up. This means that the model or intervention *may not* have an effect on the duration of abstinence. We could not claim that the model has absolutely no effect on the abstinence rates from this study as randomisation was not operated. However, we used case-control data from the national report to support this claim. According to the 2004-2008 national record data from the Ministry of Public Health the percentage of follow-up each year is about 15-25%. Of these, the percentage of relapse at one year comparing in-patients (FAST model) and out-patients (Matrix model) are the same, about 30% (ONCB, 2009). Also, the finding is not new as a previous study, "An evaluation of drug dependence treatment" (Dheerarat, 2004) which studied the treatment outcomes of 983 drug dependent patients from 6 Drug Dependence Treatment Centres (DDTCs) in the Northern, Northeastern, Southern and Central regions, and 5 provincial hospitals in Thailand. The findings reported no difference in duration of abstinence among patients in different programs who attended in the same period.

If there is no difference between the outcomes in Matrix and FAST models, in regard to the treatment, another alternative offering other advantages such as cost-effectiveness should be considered. Some studies (French *et al.*, 2000, Torchia, 2005) reported a difference in economic benefit between full continuum and partial continuum care. In-patient care is costly when compared with out-patient care. The most costly one was rehabilitation, especially residential rehabilitation (Siripen Supakankunti *et al.*, 2009). Another study in Thailand (Buranee Kanchanatawan *et al.,* 2005) reported the ratio cost of voluntary in-patient rehabilitation: voluntary out-patient rehabilitation was 5:1 and compulsory in-patient rehabilitation: compulsory out-patient rehabilitation was 11.4:1. In this case, the Matrix model might be cost effective.

Drug dependence treatment factors and its relation

As stated in chapter II, there are three factors related to drug dependence treatment i.e., drug users, environment and process of treatment. The success of treatment mainly relies on drug users, their characteristics, socio-economic, history of drug use and treatment. It is noticeable that young people have been at high risk of drug/substance use. Besides controlling sex and age group, the findings have shown other characteristics such as high percentages of the unemployed and of unskilled workers, using drugs because of curiosity, and use at a young age. Some characteristics of Matrix and FAST models are different. Drug users who attend FAST model are more likely to use drugs over a longer period. They are also more likely to be unemployed and have experience of treatment prior to the recruitment.

Environment is another factor that lures people to become drug users. At present, a lot of yaba, ice or any amphetamine type stimulants are available in the country. Drug availability, family, friends and other circumstances are considered as environment. In the study about 1/3 reported reason of drug use is because of friend's persuasion. In addition, more than 80% reported that many of their friends use yaba or methamphetamine. Albeit there is no direct evidence from this study, yaba or methamphetamine can be for functional use or use to enhance work competency (Marsden *et al*., 2002).

The process of treatment is the last factor to be considered. At present, Matrix and FAST models are the most practical models used for out-patients and in-patients rehabilitation. These models are instruments to motivate the patients to abstain from drug use. Even though the patient types are different (out-patient and in-patient), they have some similar activities such as family participation, the 12-step facilitation, adjusting/change behaviours and self-help. Albeit Matrix model attendants prone to have higher percentage of abstinence than FAST model cases, the duration of abstinence among found cases has no significant statistical difference between the two models.

If the goal of treatment is drug free or longer abstinence the treatment may not be appropriate to achieve the goal. As proof, the treatment model shows no difference

so the way of thinking on how to provide other services should be taken into account.

> The best treatment programs provide a combination of therapies and other services to meet the needs of the individual patient (National Institute on Drug Abuse, National Institute of Health. 1999:14)

Therefore, apart from considering the treatment only, alternative services must be considered. For instance, if the drug users are young people, should education programs be provided? If they have problems with health, should medical services and mental health services be provided?

Indirect outcomes from drug abstinence should lie in findings such as the importance of living happily and adjusting themselves in the community. The found cases at last follow-up (6 months after discharge) reported their improvements, the rate of antisocial behaviour like stealing money, selling drugs and quarreling with other people had disappeared or was less than the first (one month) and second (3 months) follow-up. Moreover, 72.1% and 55.3% of Matrix and FAST model attendants reported good health in general and the improvement of taking care of family, earning their living and staying at home. These findings result in good outcomes for patients that might not be as a result of the rehabilitation program but merely from self-help.

As regards six met cases of Ratchaburi Matrix patients at the last follow-up, of these, 5 cases worked in Bangkok and one case was in the hospital. They still abstained from using illegal substances. This is the example of the combination of drug users themselves and the environment, not the program attendance. At this point, it is debatable what should be provided, the program of treatment or other support.

The National agenda concession

In actual fact, treatment implementation is a matter of national policy. After the declaration of the Act in 2002, drug users are no longer criminals but patients. All drug user arrestees will be under the consideration of the probation committee

called “Drug Addict Rehabilitation Sub-committee”. Most MA users are sent to a compulsory treatment. According to the interviews of the two committees, a psychiatrist and a psychologist from two different areas, Bangkok and Ratchaburi, they revealed that:

> “At present, we choose the available place for the patients rather than the appropriate place for them. Even though we diagnose that this patient needs an intensive treatment, we still have to admit him in the five-day-camp because of its availability. The reason behind this is due to the regulation that we have to investigate the drug user after being arrested within 15 days or 30 days extension, but altogether not more than 45 days. This is why we have no choice but sending him to the camp….” (Ms. ST, a psychologist)

> “Even though we tried to do our best, there are more than 200 arrestees a month and we did not see them, only read the reports from the probation staff. So, we have to justify where the drug users will be rather than which treatment is appropriate for him.” (Dr. WP, a psychiatrist)

The rush to implement Matrix and FAST models after “War on Drug” is another problem. Implementing Matrix model without prior trial for its suitability for the Thai culture could result in its effectiveness being compromised. In addition, FAST model was adjusted from TC without any academic proof of its suitability for MA patients. This study selected the treatment units where training in applying the Matrix model had come directly from the UCLA, the source of origin of the model. According to the findings, there are significant differences in each treatment unit which might derive from the process of implementation. The observation of Matrix treatment at Thanyarak Institute and Ratchaburi Provincial Hospital has supported this idea. For instance, when a patient came 15 minutes late, at Ratchaburi Hospital, he would be asked to come back again the next day. Thanyarak Institute however would still ask the patient to participate in the group even if he came very late, 15 minutes before the group session ended. From the interview,

> "He (the patient) should understand what the time is." (Ratchaburi Hospital staff)

> "If he comes, it means that he tries to participate" (Thanyarak staff)

Furthermore, since 2009 the Government has declared a new policy for demand and supply reduction called, "Five Defensive Fences Strategy" aimed at preventing the development of a new drug using population. There is also a treatment plan to admit at least 300,000 drug abusers/addicts to suitable treatment and rehabilitation, of which a half will come from community persuasion, civil society, and as self selected volunteers. It is disappointing that no concrete provision services have come from that announcement. According to the treatment records during 2004-2008, the Ministry of Health reported only 40,000-88,600 cases attended the treatment (ONCB, treatment data. 2009). The ratio of compulsory treatment to voluntary was about 2:1 and the 2008 was 4:1. As a result, it could not be implemented. Besides the unrealistically high number, the preparation of treatment units was not mentioned.

To conclude, the research has led to further observations regarding the differences of both models whether in terms of in and out-patients, or their transformation into treatment centres in Thailand. Moreover, drug dependence treatment factors and their relationship in the environment are regarded in other aspects as well. Last but not least, the treatment units have to periodically concede to national policies while their statistical records of effectiveness are yet to be assessed.

5.3 Limitation

The limitations of the study will be presented in three topics, i.e. study design, sample recruitment and study site.

Study design

Even though this study is comparing the abstinence rate and improvement of patients who attended two drug dependence rehabilitation models, Matrix and FAST models, it is a study in the treatment centre context, not an experiment. As

mentioned, the patients can choose the model which is appropriate for their daily life. The intervention would be better scrutinised through a randomized control trial (RCT) but it was not possible to do so. Therefore, we cannot eliminate selection bias, balancing both known and unknown prognostic factors in the two models.

Sample recruitment

The Participants were recruited from patients who voluntarily participated in the project without any benefit to them for their participation. They have to be interviewed 6 times, at first recruitment, 2 times during the intervention and follow-up at 1, 3 and 6 months respectively. Only the persons who were interested in the project would agree to participate. We might miss some groups such as patients who have some problems related to drug use such as psycho-social problem, health problem, morbidity, injury etc. The missing cases were about a half (45 from 84 cases and 47 from 92 cases of Matrix and FAST model attendants respectively). Even though it is proved that the missing cases and found cases are not different, the small number of completed follow-ups means it is not possible to classify beyond two levels. For instance, the comparison across three treatment units and models as presented in the duration of abstinence at follow-up outcomes showed the different relapse in the mentioned units and models. Unfortunately, there were only 10 found in Chiang Mai Matrix model cases (See Appendix 4).

Furthermore, the participants in the study were male only. The reason female patients were not taken was due to the small number of female drug users (less than 10% of all treatment patients in 2008, ONCB data). In addition, the female patients were separately attending the process of rehabilitation from males, especially in-patient group. As a result, we cannot generalize our study to all genders. Also, the samples were currently using methamphetamine or yaba. The outcomes cannot be extrapolated that any drug users will have the same relapse rate and duration of abstinence.

The assessment information in the project was obtained from model attendants only, not from those around them such as service providers, family and community including policy makers. Therefore, the responses have not been confirmed by other

people such as the response about their behaviour improvement, i.e. staying at home, helping family etc.

Methamphetamine patients who attend the Matrix and FAST models mostly are drug free. If they are voluntary patients, they will be provided with MA detoxification before attending the Matrix or FAST model. If they are compulsory patients, they have to wait for a drug investigation for about 48-72 hours before treatment. So at that time MA has already been excreted from their bodies. Therefore, it might be different if we recruited the patients at the detoxification period and could randomise our sample.

Study site

The treatment units selected in this study are two drug dependence treatment centres, Thanyarak Institute and Chiang Mai DDTC and the psychiatric section of Ratchaburi Provincial Hospital. The study sites are large and the original sites for the models in Thailand. Even though every selected unit, the providers (i.e. counselors, nurses and physician) are specialists in drug dependence treatment, the service could be different from one another due to their situation and adjustment to their patients and areas. Taking the out-patient units as an example, the psychiatric unit at Ratchaburi Hospital is the only section with two psychiatrists, two psychology nurses and one community nurse in a general hospital while Thanyarak Institute and Chiang Mai DDTC are the centres for drug dependence treatment only. The circumstance of providing treatment services according to the drug dependent patients might be different in terms of site and relationship.

5.4 Recommendation

The recommendation herewith will be classified into 2 categories, policy implication and further research.

Policy implication

The outcomes from the study have shown some evidence to deal with the drug dependence situation, especially the methamphetamine epidemic. Also treatment alone may not be sufficient to solve the problem as long as other factors are not

seriously concentrated. In this situation, we should pay attention to prevention and rectification in two focused groups, i.e. new drug users and existing drug users.

The first group, new drug users, is a population which needs a long sustainable term of prevention. As the young population is regarded as being at high risk, it is necessary to prevent them from becoming drug users/abusers as soon as is practicable. Intensive study programs should be provided in schools as well as in the communities to educate and deter this young age group. According to the research findings, our samples started using drugs at school age, so the study program may be effective to this population. Also, the study found improvements in the patients from self-help and environment. If the community understands and requires help from one another, they can manipulate the situation and prevent new drug users.

As regards the second group, existing drug users, it is necessary to support and encourage them to abstain from drugs permanently. At this point, the treatment is important for the initiation stage, but the support from government sectors and non-government agencies are more effective. Other services provided for this population should be allocated such as vocational training, family services, medical and mental health services etc.

If the management is effective, compulsory treatment will gradually disappear. Moreover, the drug dependence treatment centres may change their roles to provide intensive care for severe cases instead.

Further research

Other types of studies should be considered such as cost-effectiveness, retention during treatment and motivation for seeking treatment. In order to have a broader assessment of the effectiveness of the models under review in this study, information from other persons such as service providers, families and friends including policy makers should be obtained. Another suggested study is the integration planning between providers and patients, tailor made to an individual to mutually agree an appropriate program/model to aim for a long period of drug abstinence.

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APPENDICES

Appendix 1

Prime Minister's Order

No. 249/2552 (2009)

Subject: The National Strength to Overcome Drugs under

Five-Defensive Fences Strategy

Phase II (November 2009-September 2010)

The current Thai Government has declared its national drug control policy by using what so-called "Five Defensive Fences Strategy" as the main mechanism to fully implement it. All concerned public agencies have given their efforts to solve the drug problem seriously and their outcomes could be seen substantially. However, the drug problem still exists, and it is the Government's first priority to overcome it.

To accelerate the drug control policy implementation to be in accordance with the Government's policy in order to urgently help Thai people out of this serious trouble; therefore, the Government issued the following orders:

1. Set up a national drug control plan which is called "Thailand's Strength to Permanently Overcome Drug Problems by using Five-Defensive Fences Strategy (Phase II)."

2. Set up strategic goals and objectives to prevent drug problems from becoming worse and build up better life and security of Thai people and the society as a whole. Therefore, 4 targets are set up as follows:

Target 1 Reduce the seriousness of drug problems in target areas and high risk groups by dividing them into 3 major areas and 3 major approaches as follows:

a. Target areas are divided into 3 major areas; i.e., 3 northern provinces which drug smuggling is found the most (Chiang Mai, Chiang Rai, and Mae Hong Son); Bangkok and provinces nearly; and 3 border provinces in the Southern part.

b. 3 major approaches for solving drug abuse problems are Therapeutic Community system, voluntary and compulsory treatment system, and correctional system.

Target 2 Reduce the seriousness of drug epidemic which has a big impact on Thai people by :

a. Taking at least 300]000 drug abusers/addicts to suitable treatment and rehabilitation which a half of them will come from communities' persuasion, civil society, and their voluntaries.

b. Reducing the numbers of drug traffickers/dealers all over the country, and improve environments to prevent young people and risk groups from getting involved with drugs.

c. Focusing on solving problems in serious drug epidemic areas in 285 districts all over the country.

Target 3 Strengthen communities and civil societies mechanism to play more roles in solving drug problems in those target areas.

Target 4 Strengthen mechanism, systems, and management of drug control in critical situations

3. Implementation:

3.1 Concept and framework of the Strategy in phase II will follow those of the Strategy in Phase I which are still focused on 4 main themes; i.e., control drugs, control target areas, improve environments, and control drug abusers/addicts by balancing and integrating the entire national drug control system.

3.2 Technical Implementation is set up for 5 tactics to stop the seriousness of drug problems; i.e., drug epidemic reducing tactic, solving problems at critical points tactic, government-society cooperative strength tactic, and crisis management tactic.

3.3 Measures are set up into 2 levels as follow:

- Measure level I : is the general measure to be implemented in common areas according to the Five Defensive Fences Strategy which is consisted of 9 major projects as follow:

Project 1 Border Fence or Drug Interception at Border Areas Project is the project which aims at cutting the supply of drugs from outside the country by using various measures.

Project 2 Community Fence or Drug Prevention Campaigns by Enhancing a Cooperation between Communities and Civil Society Project which aims at reducing the seriousness of drug epidemic in target communities/villages.

Project 3 Social Fence of Integrated Social Orders Project which aims at eliminating all kinds of risk factors to prevent young people from getting involved with drugs, and to build up drug immunity.

Project 4 School Fence or Prevention of Drug Abuse in Schools Project which aims at strengthening educational institutions with drug prevention activities.

Project 5 Family Fence or Strong and White Family Project

Project 6 Drug Suppression Project which aims at cracking down drug trafficking networks/syndicates at different levels

Project 7 Treatment and Rehabilitation of Drug Addicts Project by taking them to suitable treatment and rehabilitation programme for their social reintegration.

Project 8 Drug Prevention in Work Places Project which aims at strengthening work places and factories to stay away from drugs.

Project 9 Drug Control Management Project

- Measure level 2 : is the specific measure to be implemented in target areas in order to solve specific problems which consisted of 3 target areas and 3 operational systems as follows:

Target area 1 consisted of 3 northern border provinces; i.e., Chiang Mai, Chiang Rai, and Mae Hong Sorn covering 14 districts which are the front line to combat illicit drugs.

Target area 2 consisted of Bangkok the capital city and provinces nearby which are major drug epidemic areas (35% of the overall drug epidemic area in the country)

Target 3 consisted of 3 southern border provinces; i.e., Pattanee, Yala, Narathiwat, and plus 4 districts in Songkla Province which is the area of insecurity.

Operational System 1 is aimed at taking drug abusers/addicts to treatment programme by using community and civil society mechanism as well as voluntary basis.

Operational Systems 2 is aimed at developing compulsory treatment programme to serve the numbers of drug abusers/addicts as many as possible.

Operational System 3 is aimed at preventing and solving drug problems in prisons to eliminate drug trafficking

Remarks: The specific measure for 3 target areas and 3 operational systems will be set up in details later.

4. Framework and mechanism to solve drug problems:

4.1 Follow work guidelines as directed by the Prime Minister Order's no. 82/2552 dated 17 March 2009 Subject : Government's Drug Control Strategy and Order from Narcotics Control Board no. 1/2552 dated 3 April 2009 Subject : Mechanism for Drug According to Five Defensive Fences Strategy Phase I.

4.2 Set up special task forces for drug control to be responsible for monitoring drug control works in those 3 target areas which is supervised by the Internal Security Operations Command (ISOC) and appointed by the Chairman of Narcotics Control Board. Those special task forces are:

4.2.1 Coordinating Center for Drug Interception and Prevention in Northern Border Areas

4.2.2 Drug Control Coordination Center in Bangkok and provinces nearby

4.2.3 Drug Control Coordination Center 3 Southern Border Provinces

4.3 Set up monitoring mechanism to catch up the serious situation/problem that has an impact on the achievement of drug control operations.

4.4 Set up drug prevention mechanism at district and provincial levels to mobilize drug control works between the civil society and government agencies.

4.5 Set up mechanism to be responsible for monitoring the abuse by drug law enforcement officers.

4.6 Set up a special task force to monitor special problems which will be appointed by the Chairman of Narcotics Control Board.

4.7 Organization structures, direction, coordination, follow-up, evaluation, and work reports of those centers mentioned above will be directed by the Chairman of Narcotics Control Board.

5. Period of Implementation: Star from 1st November 2009 to 30th September 2010. The first evaluation will be conducted within 6 months after the start date.

6. Direction of Implementation

6.1 To carry out policies/plans according to the Five-Defensive Fences Strategy, action plans shall be set up completely within 15th December 2009.

6.2 Every concerned agency that has the budget shall allocate it to be accord with the implementation of those action plans and transfer the budget to local concerned agencies in regions/provinces. This process shall be done within November 2009 after that inform the Provincial Center for Combating Drugs (PCCD) all over the country to carry out and integrate action plans.

6.3 Execution, direction, and outcomes of the plan implementation shall be reported the same way as they were reported in the Five - Defensive Fences Strategy in Phase I.

7. Expenses

Per diem, allowance, accommodations, traveling expense, and other expenses shall conform to the Royal Decree on the Allowance for Committee Meeting B.E.2547 (2004).

8. Promotion and Penalty

Promotion and penalty for governmental drug control officials and concerned people shall be considered and decided by the Internal Security Operations Command with the agreement from the Chairman of Narcotics Control Board.

9. Compliance

The National Strength to Overcome Drugs under Five-Defensive Fences Strategy Phase II shall be abided by all concerned parties as long as there is no changing order from Prime Minister. Other orders that do not comply with this order shall not be used against it.

Prime Minister's Order no. 249/2552 shall be used from now on.

Ordered on 10th November 2009

(Mr. Abhisit Vejjajeva)

Prime Minister

Appendix 2

G1_1/4

BASELINE ASSESSMENT

Treatment Unit.....**Model**... ☐**Matrix** ☐**FAST** ☐**Others** 1☐☐☐4☐

A. General Information

1) Interview date.....Month.....Year 2..... Interviewer..... 5☐☐

2) Respondent (Nickname) ..... Age on admission.....Years 7☐☐

3) Race 1☐Thai 2☐Hill tribe specify tribe…….. 3☐Others specify…..…… 9☐

4) Religion 1☐Buddhist 2☐Christ 3☐Islam 4☐Others specify ……..... 10☐

5) Education level..... Age finished school.....Years 11☐12☐☐

6) Previous residence (Province)..... 14☐☐

7) Present address...Moo....Soi.....Road.....Sub-district.....District……Province…..... 16☐☐☐☐

8) Marital status 1☐Never married 2☐Married 3☐Divorce/widow 4☐Others specify.....20☐

9) Family status 1☐Head of household 2☐Spouse 3☐Parents 21☐

4☐Offspring 5☐ Others specify.....

10) Occupation specify..... 0☐Unemployed 8☐Student 22☐☐

Income.....Baht/month 24☐☐☐☐

11) Extra income including illegal job specify…….. 28☐

0☐None 1☐Family 2☐Drug pusher 3☐Stolen 4☐ Others specify.....

Estimate extra income .....Baht/month 29☐30☐☐

B. Family and Social Environment

1) General residence 32☐

1. Type of house

[ ] Single [ ] Rolling house [ ] Apartment/condomenium

[ ] Townhouse [ ] Rolling building [ ] Slum [ ] Others specify.....

2) In the community, are there any drug abusers? (If yes, specify……..)

Drug	In the community		Friends		Family (live in the same house)				
	1.No	2.Yes.....persons	1.No	2.Yes.....persons	1.No	2.Parents	3.Brother	4.Relatives	
1.Cannabis	☐	☐..... persons	☐	☐.... persons	☐	☐	☐	☐	34☐☐☐☐☐☐☐
2.Kratom	☐	☐..... persons	☐	☐.... persons	☐	☐	☐	☐	41☐☐☐☐☐☐☐
3.ATS	☐	☐..... persons	☐	☐.... persons	☐	☐	☐	☐	48☐☐☐☐☐☐☐
4.Opium	☐	☐..... persons	☐	☐.... persons	☐	☐	☐	☐	55☐☐☐☐☐☐☐
5.Heroin	☐	☐..... persons	☐	☐.... persons	☐	☐	☐	☐	62☐☐☐☐☐☐☐
6.Inhalants	☐	☐..... persons	☐	☐.... persons	☐	☐	☐	☐	69☐☐☐☐☐☐☐
7.Ecstasy	☐	☐..... persons	☐	☐.... persons	☐	☐	☐	☐	76☐☐☐☐☐☐☐
8.Ketamine	☐	☐..... persons	☐	☐.... persons	☐	☐	☐	☐	83☐☐☐☐☐☐☐
9.Cocaine	☐	☐..... persons	☐	☐.... persons	☐	☐	☐	☐	90☐☐☐☐☐☐☐
10.Domicum	☐	☐..... persons	☐	☐.... persons	☐	☐	☐	☐	97☐☐☐☐☐☐☐
11. Ice	☐	☐..... persons	☐	☐.... persons	☐	☐	☐	☐	104☐☐☐☐☐☐☐

3) Family relationship 111☐

1☐Good 2☐Bad 3☐Separate 4☐Divorce 5☐Father died 6☐Mother died

7☐ Others specify.....

C. Drug Use Experience

1) Drug use experience (Ask every substance abuse except alcohol and cigarette)

Substance	Ever used	Reason of use*	Age first used	Route of administration	Used within 12 months	Used within last 30 days	Used with…..**	
	0.No 1.Yes				000 No 001 Specify..times	000 No 001 Specify.. times		
1.Cannabis	☐ ☐		……years		☐☐☐	☐☐☐		112☐☐☐☐☐☐
2.Kratom	☐ ☐		……years		☐☐☐	☐☐☐		118☐☐☐☐☐☐
3.ATS	☐ ☐		……years		☐☐☐	☐☐☐		124☐☐☐☐☐☐
4.Opium	☐ ☐		……years		☐☐☐	☐☐☐		130☐☐☐☐☐☐
5.Heroin	☐ ☐		……years		☐☐☐	☐☐☐		136☐☐☐☐☐☐
6.Inhalants	☐ ☐		……years		☐☐☐	☐☐☐		142☐☐☐☐☐☐
7.Ecstasy	☐ ☐		……years		☐☐☐	☐☐☐		148☐☐☐☐☐☐
8.Ketamine	☐ ☐		……years		☐☐☐	☐☐☐		154☐☐☐☐☐☐
9.Cocaine	☐ ☐		……years		☐☐☐	☐☐☐		160☐☐☐☐☐☐
10.Domicum	☐ ☐		……years		☐☐☐	☐☐☐		166☐☐☐☐☐☐
11. Ice	☐ ☐		……years		☐☐☐	☐☐☐		172☐☐☐☐☐☐

* Reason of use 1.Persuated by friends 2.Curiosity 3.Enjoyment 4.Released illness 5. Depress 6. Functional use 7.Use for main drug

** Specify the name of substance

2) Drug use in the last 30 days before treatment admission (Excluded alcohol and cigarette)

Substance	Type of use	Route of administration	Quantity of use (tablet or other)	Times/day	Money spent/time	
1.....	☐1.Single ☐2.Mixed ☐3.Alternated					178☐☐☐☐☐☐
2.....	☐1.Single ☐2.Mixed ☐3.Alternated					184☐☐☐☐☐☐

3) Last substance use before treatment..... When (D/M/Y)..... 190☐☐☐☐☐

Route of administration ☐1.IV ☐2.Oral ☐3.Smoke ☐4.Inhale ☐5. Others specify..... 195☐

Quantity of use..... Money spent on drug..... .....Baht 196☐☐☐☐☐☐

Actually, activity after used substance/drug.....specify..... 202☐

4) Have ever injected drug ☐0. No ☐1. Yes, specify drug..... 203☐

In the past 12 months, have ever injected drug… 204☐

0☐No 1☐Sometimes 2☐ 1-3 times/month 3☐ 1-3 times/week 4☐Everyday

Have ever shared injecting instrument ☐0. No ☐1. Yes, specify last time of sharing..... 205☐

5) Drinking alcohol*** ☐0. Never ☐1.Yes, age first drank..... Last drinking (D/M/Y)..... 206☐☐☐☐☐

Reason on first drink ☐0. Never drink ☐1. Persuaded by friends ☐2. Curiosity 211☐

☐3. Enjoyment ☐4. Released illness ☐5. Depress

☐6. Functional use ☐7. Use for main drug ☐8.Others, specify.....

****Alcohol all types*

G1_3/4

D. Experience of Treatment

1) Have you been to the treatment before this time? ☐0. No (Go to 2) ☐Yes, …….. times* 212☐☐

First treatment at.....When? (M/Y).....Type of drug use…….... 214☐☐☐☐☐☐

Duration of abstinence .....ปี.....เดือน ☐ Cannot stop/less than 7 days 221☐☐☐

Last treatment at.....When? (M/Y).....Type of drug use…….... 225☐☐☐☐☐☐

Duration of abstinence .....ปี.....เดือน ☐ Cannot stop/less than 7 days 232☐☐☐

Have you been treated in the same model (Matrix/FAST) as this time? ☐0. No (Go to 2) ☐Yes (Exclude from sample)

** If only one time counted as first treatment*

2) Do you think it is necessary for you to this treatment? 236☐

0☐Not at all 1☐Not much 2☐Moderate 3☐Much 4☐Very much

E. Imprisonment

1) Have you ever been arrested? ☐0. No (Go to F) ☐ Yes, …….. times 237☐

First arrest When? (M/Y).....Result, go to prison for……..years/month 238☐☐☐☐☐☐

Case of arrest ☐1.Related to drug, specify..... ☐2. Not related to drug, specify..... 244☐☐

Last arrest When? (M/Y).....Result, go to prison for……..years/month 246☐☐☐☐☐☐

Case of arrest ☐1.Related to drug, specify..... ☐2. Not related to drug, specify..... 252☐☐

* *If only one time counted as first arrest*

F. Level of Addiction

1. Increased the quantity of drug use	0☐No	1☐Yes	254☐
2. Tried to stop using drug but unsuccessful	0☐No	1☐Yes	255☐
3. Use most of time in drug purchased, used and intoxicated	0☐No	1☐Yes	256☐
4. Absented from work or school due to using drug	0☐No	1☐Yes	257☐
5. Had accident due to using drug	0☐No	1☐Yes	258☐
6. Used less time with friends due to using drug	0☐No	1☐Yes	259☐
7. Drug use had effected to psychoproblem	0☐No	1☐Yes	260☐
8. Drug use had effected to family, friends and colleagues	0☐No	1☐Yes	261☐
9. Drug use made you unhealthy	0☐No	1☐Yes	262☐
10. Before you attended the treatment, you increased drug use as the same amount was not intoxicated	0☐No	1☐Yes	263☐
11. You need to use drug to protect withdrawal symptom	0☐No	1☐Yes	264☐
12. You'll feel uncomfortable or moody if you stop using drug	0☐No	1☐Yes	265☐
13. Do you think that you have problem with drug use			266☐

0☐Not at all 1☐A little 2☐Moderate 3☐Much 4☐Very much

G1_4/4

Mapping for follow-up

Telephone at home..... Mobile.....

Address in detail……

Notify places (e.g. department store, junction, community information etc…)…….....

Map to the house (draw at below space)..... ....

..... Interviewer

P1_1/5

EVALUATION OF SELF AND TREATMENT

(TCU CORRECTIONAL OUTPATIENT FORMS)

Treatment Unit.....**Model**... ☐**Matrix** ☐**FAST** ☐**Others** 1☐☐☐4☐

Interview #1 ☐ #2 ☐ Date.....Month.....Year 20..... Admission date (D/M/Y).....

A. RATINGS OF SELF: Circle the answer that shows how much you agree or disagree that each item describes you or the way you have been feeling lately.

	DISAGREE STRONGLY			NOT SURE			AGREE STRONGLY
1. You like to take chances.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
2. You feel people are important to you.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
3. You feel sad or depressed.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
4. You feel honesty is required in every situation.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
5. You have serious drug-related health problems.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
6. You have little control over the things that happen to you.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
7. You have too many outside responsibilities now to be in this treatment program.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
8. You have much to be proud of.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
9. In general, you are satisfied with yourself.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
10. You like the “fast” life.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
11. There is really no way you can solve some of the problems you have.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
12. You could be sent to jail or prison if you are not in treatment.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
13. You feel mistreated by other people.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
14. You have thoughts of committing suicide.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
15. You have trouble sitting still for long.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
16. You like others to feel afraid of you.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
17. There is little you can do to change many of the important things in your life.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
18. You have trouble following rules and laws.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
19. This treatment program seems too demanding for you.	1☐	2☐	3☐	4☐	5☐	6☐	7☐

P1_2/5

A. RATINGS OF SELF: Cont.

	DISAGREE STRONGLY			NOT SURE			AGREE STRONGLY
20. You feel lonely.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
21. You like friends who are wild.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
22. You like to do things that are strange or exciting.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
23. You feel like a failure.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
24. You have trouble sleeping.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
25. You often feel helpless in dealing with the problems of life.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
26. You feel a lot of pressure to be in treatment.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
27. You depend on “things” more than on “people”.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
28. You feel interested in life.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
29. This treatment may be your last chance to solve your drug problems.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
30. You have urges to fight or hurt others.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
31. You avoid anything dangerous.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
32. Sometimes you feel that you are being pushed around in life.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
33. You feel you are basically no good.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
34. This kind of treatment program will not be very helpful to you.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
35. You have a hot temper.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
36. You keep the same friends for a long time.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
37. You have legal problems that require you to be in treatment.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
38. You plan to stay in this treatment program for awhile.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
39. You feel anxious or nervous.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
40. Your temper gets you into fights or other trouble.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
41. You have trouble concentrating or remembering things.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
42. You feel extra tired or run down.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
43. You work hard to keep a job.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
44. You are in this treatment program because someone else made you come.	1☐	2☐	3☐	4☐	5☐	6☐	7☐

P1_3/5

A. RATINGS OF SELF: Cont.

	DISAGREE STRONGLY			NOT SURE			AGREE STRONGLY
45. What happens to you in the future mostly depends on you.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
46. You feel afraid of certain things, like elevators, crowds, or going out alone.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
47. You are concerned about legal problems.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
48. You only do things that feel safe.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
49. You get mad at other people easily.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
50. Your religious beliefs are very important in your life.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
51. You wish you had more respect for yourself.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
52. You worry or brood a lot.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
53. You can do just about anything you really set your mind to do.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
54. This treatment program can really help you.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
55. You have carried weapons, like knives or guns.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
56. You feel tense or keyed-up.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
57. You are very careful and cautious.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
58. You want to be in a drug treatment program.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
59. Taking care of your family is very important.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
60. You feel you are unimportant to others.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
61. You feel a lot of anger inside you.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
62. You feel tightness or tension in your muscles.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
63. You have family members who want you to be in treatment.	1☐	2☐	3☐	4☐	5☐	6☐	7☐

B. RATINGS OF TREATMENT PROCESS: Circle the answer that shows how much you agree or disagree that each item describes how you feel about your experiences at this treatment program.

	DISAGREE STRONGLY			NOT SURE			AGREE STRONGLY
1. You feel and show concern for others during group counseling.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
2. Your counselors are easy to talk to.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
3. You trust the treatment staff.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐

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B. RATINGS OF TREATMENT PROCESS: Cont.

	DISAGREE STRONGLY			NOT SURE			AGREE STRONGLY
4. Your counselors help you develop confidence in yourself.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
5. You have developed positive trusting friendships while at this program.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
6. Your counselors are well organized and prepared for each counseling session.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
7. The treatment staff cares about you and your problems.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
8. You have made progress with your drug/alcohol problems.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
9. Your counselors develop treatment plans with reasonable objectives for you.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
10. The treatment staff is helpful to you.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
11. You have made progress with your emotional or psychological issues.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
12. Your counselors keep you focused on solving specific problems.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
13. The security staff cares about you and your problems.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
14. You have made progress toward your treatment goals.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
15. Your counselors remember important details from your earlier sessions.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
16. The security staff is helpful to you.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
17. Your counselors help you make changes in your life.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
18. You accept being confronted by others during group counseling.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
19. Your counselors speak in a way that you understand.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
20. You confront others about their real feelings during group counseling.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
21. Your counselors respect you and your opinions.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
22. You are willing to talk about your feelings during group counseling.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
23. Your counselors understand your situation and problems.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
24. You say things to give support and understanding to others during group counseling.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
25. You trust your counselors.	1☐	2☐	3☐	4☐	5☐	6☐	7☐

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B. RATINGS OF TREATMENT PROCESS: Cont.

	DISAGREE STRONGLY			NOT SURE			AGREE STRONGLY
26. You give honest feedback to others during group counseling.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
27. Your counselors help you view problems/situations realistically.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
28. You have made progress in understanding your feelings and how they can influence behavior.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
29. Your counselors focus your thinking and planning.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
30. You trust other clients in this program.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
31. Your counselors make you feel foolish or ashamed.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
32. Your counselors teach you useful ways to solve your problems.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
33. Your are motivated and encouraged by your counselors.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
34. You trust the security staff.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐

C. RATINGS OF PROGRAM ATTRIBUTES: Circle the answer that shows how much you agree or disagree that each item describes how you feel about the different parts of this program.

	DISAGREE STRONGLY			NOT SURE			AGREE STRONGLY
1. This program location is convenient for you.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
2. You need more educational or vocational training services.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
3. Other clients at this program care about you and your problems.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
4. Program staff here are efficient at doing their jobs.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
5. Several people close to you have serious drug problems.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
6. Time schedules for counseling sessions at this program are convenient for you.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
7. You have people close to you who respect you and your efforts in this program.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
8. Other clients at this program are helpful to you.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
9. You get too much personal counseling at this program.	1☐	2☐	3☐	4☐	5☐	6☐	7☐

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C. RATINGS OF PROGRAM ATTRIBUTES: Cont.

	DISAGREE STRONGLY			NOT SURE			AGREE STRONGLY
10. You have people close to you who understand your situation and problems.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
11. You need more individual counseling sessions.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
12. You have people close to you who can always be trusted.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
13. You need more group counseling sessions.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
14. You have people close to you who motivate and encourage your recovery.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
15. You are similar (or like) other clients of this program.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
16. This program is organized and run well.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
17. You have people close to you who expect you to make positive changes in your life.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
18. You need more lecture classes.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
19. You have improved your relations with other people because of this treatment.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
20. You are satisfied with this program.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
21. Other clients in this program are helpful in your recovery.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
22. You need more medical care and services.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
23. You have people close to you who help you develop confidence in yourself.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
24. You need more help with your emotional troubles.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
25. You have close family members who help you stay away from drugs.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
26. There is a sense of family (or community) in this program.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
27. You work in situations where drug use is common.	1☐	2☐	3☐	4☐	5☐	6☐	7☐
28. This program is requiring you to learn responsibility and self-discipline.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐
29. You have good friends who do not use drugs.....	1☐	2☐	3☐	4☐	5☐	6☐	7☐

D. **General Information**

Name of patient……Age……years Admission date (D/M/Y).....

In the past 30 days, did you use drug? 0☐ Not at all 1☐Yes, specify……

How many times?..... Cause of use, specify……

Thank you for your cooperation. Date (D/M/Y)..... Interviewer…….

DISCHARGE REPORT **DF**

Treatment Unit.....**Model**... ☐**Matrix** ☐**FAST** ☐**Others** 1☐☐☐4☐

This report is for treatment provider to record for each patient

Date (D/M/Y)..... Interviewer.....

Name of patient.....Age.....years Admission date (D/M/Y).....

Drug used before admission.....

A. Cause of discharge

1) ☐ Finish program

2) ☐ Refer to other treatment unit

3) ☐ Patient requested, reason 1☐ Move to live in other place 2☐ Change workplace 3☐ Leave without reason 4☐ Others, specify.....

Who inform the reason? 1☐ Patient 2☐ Friend 3☐ Family 4☐ Others, specify.....

4) ☐ Not finish program, discharge by the treatment unit, reason.....

5) ☐ Arrested by policeman, Date (D/M/Y).....

6) ☐ Others, specify.....

B. Last day of participating activity in the program.....

C. Patient development

0☐ Do not satisfy 1☐ Less improved 2☐ Improved 3☐ Improved a lot 4☐ Most improved

Urine test result before discharge 0☐ Negative 1☐ Positive

D. Follow-up

0☐ Did not make appointment because.....

1☐ Make appointment at the treatment unit .....times on..

a) Date (D/M/Y).....

b) Date (D/M/Y).....

c) Date (D/M/Y).....

d) Date (D/M/Y).....

2☐ Make appointment at patient's home .....times on..

a) Date (D/M/Y).....

b) Date (D/M/Y).....

c) Date (D/M/Y).....

d) Date (D/M/Y).....

Appendix 3

Table A.3.1 General characteristics

	FAST Model						Matrix Model							
	Chiang Mai DDTC		Thanyarak Institute		Total		Chiang Mai DDTC		Thanyarak Institute		Ratchaburi Hospital		Total	
1.Age on admission	N	%	N	%	N	%	N	%	N	%	N	%	N	%
15-19	18	40.0	9	19.1	27	29.3	13	56.5	6	30.0	12	29.3	31	36.9
20-24	10	22.2	13	27.7	23	25.0	4	17.4	2	10.0	10	24.4	16	19.0
25-29	10	22.2	15	31.9	25	27.2	3	13.0	6	30.0	7	17.1	16	19.0
30-35	7	15.5	10	21.3	17	18.5	3	13.0	6	30.0	12	29.3	21	25.0
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.0
Median	22.0		25.0		24.0		19.0		26.0		24.0		22.5	
Mean	22.8		24.8		23.8		21.5		25.2		24.3		23.8	
Std. Deviation	5.6		5.0		5.4		5.9		5.5		5.8		5.9	
2.Race														
Thai	43	95.6	47	100.0	90	97.8	23	100.0	20	100.0	41	100.0	84	100.0
Hill tribe	2	4.4	-	-	2	2.2								
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.0
3.Religion														
Buddhist	44	97.8	43	91.5	87	94.6	22	95.7	20	100.0	41	100.0	83	98.8
Christ	1	2.2	-	-	1	1.1	1	4.3	-	-	-	-	1	1.2
Islam	-	-	4	8.5	4	4.3	-	-	-	-	-	-	-	-
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.0
4.Years completed school														
1-6 years	12	26.7	14	29.8	26	28.3	1	4.3	1	5.0	16	39.0	18	21.4
7-9 years	19	42.2	24	51.1	43	46.7	14	60.9	8	40.0	19	46.3	41	48.8
10-12 years	9	20.0	7	14.9	16	17.4	4	17.4	9	45.0	4	9.8	17	20.2
Vocational school	5	11.1	2	4.3	7	7.6	2	8.7	2	10.0	1	2.4	5	6.0
High school	-	-	-	-	-	-	2	8.7	-	-	-	-	2	2.4
Others	-	-	-	-	-	-	-	-	-	-	1	2.4	1	1.2
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.0
5.Age off school														
10-14	14	31.1	13	31.7	27	31.4	3	13.0	2	10.0	11	42.3	16	23.2
15-19	26	57.8	26	63.4	52	60.5	18	78.3	16	80.0	15	57.7	49	71.0
20-24	5	11.1	2	4.9	7	8.1	2	8.7	2	10.0			4	5.8
No response			(6)		(6)								(15)	
Total	45	100.0	41	100.0	86	100.0	23	100.0	20	100.0	26	100.0	69	100.0
Median	15.0		15.0		15.0		15.0		15.0		15.0		15.0	
Mean	15.8		15.2		15.5		15.8		16.4		14.5		15.5	
Std. Deviation	2.8		2.4		2.7		2.5		3.2		1.9		2.6	
6.Marital status														
Single	32	71.1	31	66.0	63	68.5	20	87.0	11	55.0	29	70.7	60	71.4
Married	10	22.2	14	29.8	24	26.1	3	13.0	7	35.0	11	26.8	21	25.0
Divorce/widow	3	6.7	2	4.3	5	5.4			2	10.0	1	2.4	3	3.6
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.0

Table A.3.1 Cont.

	FAST Model						Matrix Model							
	Chiang Mai DDTC		Thanyarak Institute		Total		Chiang Mai DDTC		Thanyarak Institute		Ratchaburi Hospital		Total	
7.Status in the household	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Head /spouse	13	28.9	10	21.3	23	25.0	2	8.7	5	25.0	4	9.7	11	13.1
Parents			1	2.1	1	1.1					3	7.3	3	3.6
Offspring	30	66.7	35	74.5	65	70.6	20	87.0	12	60.0	33	80.5	65	77.3
Others	2	4.4	1	2.1	3	3.3	1	4.3	3	15.0	1	2.4	5	6.0
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.0
8.Occupation														
Unemployed	15	33.3	12	25.5	27	29.3	4	17.4	3	15.0	9	22.0	16	19.0
Employee	4	8.9	1	2.1	5	5.4	1	4.3	3	15.0	2	4.9	6	7.1
Skilled worker	5	11.1	7	14.9	12	13.0	2	8.7	1	5.0	1	2.4	4	4.8
Unskilled worker	8	17.8	18	38.3	26	28.3	2	8.7			20	48.8	22	26.2
Driver	2	4.4	2	4.3	4	4.4			5	25.0	2	4.9	7	8.3
Family's business	4	8.9	2	4.3	6	6.5			3	15.0			3	3.6
Trader	3	6.7	2	4.3	5	5.4			2	10.0	3	7.3	5	6.0
Official worker	2	4.4	1	2.1	3	3.3	1	4.3					1	1.2
Student	2	4.4	2	4.3	4	4.4	13	56.5	3	15.0	4	9.8	20	23.8
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.0
9.Income/month	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Unemployed	15	33.3	12	26.1	27	29.7	4	17.4	3	15.0	9	22.5	16	19.3
Student	2	4.4	2	4.3	4	4.4	13	56.5	3	15.0	4	10.0	20	24.1
LE 2500 Bt			1	2.2	1	1.1					6	15.0	6	7.2
2501-5000 Bt	7	15.6	3	6.5	10	11.0			3	15.0	7	17.5	10	12.1
5001-7500 Bt	8	17.8	13	28.3	21	23.0	2	8.7	4	20.0	12	30.0	18	21.7
7501-10000 Bt	7	15.6	10	21.7	17	18.7	1	4.3	4	20.0	2	5.0	7	8.4
10001-20000 Bt	4	8.9	5	10.9	9	9.9	3	13.0	2	10.0			5	6.0
GT 20000 Bt	2	4.4			2	2.2			1	5.0			1	1.2
No response			(1)		(1)						(1)		(1)	
Total	45	100.0	46	100.0	91	100.0	23	100.0	20	100.0	40	100.0	83	100.0
Median	7,250		7,250		7,250		9,900		7,750		6,000		6,000	
Mean	9,425		8,005		8,668		9,800		8,898		4,933		6,735	
Std. Deviation	6,615		3,176		5,083		3,622		4,911		2,254		3,958	
10.Source of extra income														
None	27	60.0	22	46.8	49	53.2	5	21.7	18	90.0	30	73.2	53	63.0
Parents	9	20.0	8	17.0	17	18.5	14	60.9	1	5.0	11	26.8	26	31.0
Legal job	6	13.3	8	17.0	14	15.2	3	13.0					3	3.6
Drug selling	1	2.2	9	19.1	10	10.9	1	4.3	1	5.0			2	2.4
Illegal job	2	4.4			2	2.2								
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.0

Table A.3.2 Environmental characteristics

	FAST Model						Matrix Model							
	Chiang Mai DDTC		Thanyarak Institute		Total		Chiang Mai DDTC		Thanyarak Institute		Ratchaburi Hospital		Total	
1.Original residence	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Chiang Mai	15	33.3			15	16.3	18	78.3					18	21.4
Payao									2	10.0			2	2.4
Pathumtani			17	36.2	17	18.5			1	5.0			1	1.2
Bangkok			11	23.4	11	12.0	1	4.3	8	40.0	1	2.4	10	11.9
Nonthaburi			7	14.9	7	7.6								
Lumphun	13	28.9			13	14.1								
Lumpang	6	13.3			6	6.5	1	4.3					1	1.2
Ratchaburi									1	5.0	36	87.8	37	44.0
Nakhon Ratchasima									2	10.0			2	2.4
Others	11	24.4	12	25.5	23	25.0	3	13.0	6	30.0	4	9.8	13	15.5
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.0
2.Present residence														
Chiang Mai	16	35.6			16	17.4	22	95.7					22	26.2
Payao	4	8.9			4	4.4								
Pathumtani			17	36.2	17	18.5			9	45.0			9	10.7
Bangkok			12	25.5	12	13.0			8	40.0	1	2.4	9	10.7
Nonthaburi			7	14.9	7	7.6			1	5.0			1	1.2
Lumphun	15	33.3			15	16.3								
Lumpang	5	11.1			5	5.4								
Ratchaburi											36	87.8	36	42.9
Others	5	11.1	11	23.4	16	17.4	1	4.3	2	10.0	4	9.8	7	8.3
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.0
3.Type of residence														
Single house	39	86.7	30	63.8	69	75.0	11	47.8	13	65.0	26	63.4	50	59.5
Row building	6	13.3			6	6.5	5	21.7	1	5.0	6	14.6	12	14.3
Condo/apartment			3	6.4	3	3.3	4	17.4	2	10.0			6	7.1
Town house			8	17.0	8	8.7	2	8.7	3	15.0			5	6.0
Commercial bld			1	2.1	1	1.1	1	4.3	1	5.0	2	4.9	4	4.8
Slum			5	10.6	5	5.4					6	14.6	6	7.1
Others											1	2.4	1	1.2
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.0
4.Parents relationship														
Good	23	51.1	20	42.6	43	46.7	16	69.6	16	80.0	24	58.5	56	66.7
Not so good			2	4.3	2	2.2	4	17.4			2	4.9	6	7.1
Separate	3	6.7	8	17.0	11	12.0					6	14.6	6	7.1
Divorce	10	22.2	7	14.9	17	18.5	1	4.3	2	10.0	5	12.2	8	9.5
Father dead	5	11.1	5	10.6	10	10.9	2	8.7	1	5.0	4	9.8	7	8.3
Mother dead	1	2.2	5	10.6	6	6.5								
Parents dead	3	6.7			3	3.3			1	5.0			1	1.2
Total	45	100.0	47	100.0	92	100.1	23	100.0	20	100.0	41	100.0	84	99.9

Table A.3.2 Cont.

	FAST Model						Matrix Model							
	Chiang Mai DDTC		Thanyarak Institute		Total		Chiang Mai DDTC		Thanyarak Institute		Ratchaburi Hospital		Total	
5.Drug use among friends	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Cannabis	4	8.9	20	42.6	24	26.1	9	39.1	3	15.0	1	2.4	13	15.5
Kratom			7	14.9	7	7.6								
Meth	39	86.7	39	83.0	78	84.8	23	100.0	16	80.0	32	78.0	71	84.5
Opium							1	4.3					1	1.2
Heroin							1	4.3					1	1.2
Inhalants	2	4.4	5	10.6	7	7.6	2	8.7					2	2.4
Ecstasy			3	6.4	3	3.3								
Ketamine			2	4.3	2	2.2								
Domicum			1	2.1	1	1.1	1	4.3	1	5.0			2	2.4
Ice			11	23.4	11	12.0								
Number	45		47		92		23		20		41		84	
6.Drug use among family members														
Cannabis	1	1.2	3	6.4	4	4.4	1	4.3					1	1.2
Kratom			3	6.4	3	3.3								
Meth	4	8.9	6	12.8	10	10.9	3	13.0			1	2.4	4	4.8
Inhalants							1	4.3					1	1.2
Number	45		47		92		23		20		41		84	

Table A.3.3 Drug use experience

	FAST Model						Matrix Model							
	Chiang Mai DDTC		Thanyarak Institute		Total		Chiang Mai DDTC		Thanyarak Institute		Ratchaburi Hospital		Total	
1.Cause of first meth use	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Persuaded by friend	14	31.1	13	27.7	27	29.3	5	21.7	4	20.0	16	39.0	25	29.8
Curiosity	21	46.7	11	23.4	32	34.8	8	34.8	13	65.0	21	51.2	42	50.0
Enjoyment	1	2.2	3	6.4	4	4.4	9	39.1					9	10.7
Depressed	4	8.9	4	8.5	8	8.7					1	2.4	1	1.2
Help to work	5	11.1	4	8.5	9	9.8	1	4.3	2	10.0	2	4.9	5	6.0
More than one reasons			12	25.5	12	13.0			1	5.0	1	2.4	2	2.4
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.1
2.Age first drug use														
LT 10			1	2.1	1	1.1								
10-14	11	24.5	8	17	19	20.7	1	4.3	0	0	5	12.2	6	7.2
15-19	25	55.7	27	57.4	52	56.5	19	82.5	12	60	24	58.5	55	65.4
20-24	9	19.9	11	23.4	20	21.7	3	12.9	8	40	12	29.3	23	27.3
Total	45	100.0	47	100.0	92	100.1	23	100.0	20	100.0	41	100.0	84	99.9
Median	16.0		16.0		16.0		17.0		18.0		18.0		18.0	
Mean	17.4		17.0		17.2		17.6		20.0		18.3		18.6	
Std. Deviation	4.4		4.0		4.2		2.6		4.4		3.9		3.8	

Table A.3.3 Cont.

	FAST Model						Matrix Model							
	Chiang Mai DDTC		Thanyarak Institute		Total		Chiang Mai DDTC		Thanyarak Institute		Ratchaburi Hospital		Total	
3.Route of administration	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Smoke	44	97.8	47	100.0	91	98.9	23	100.0	20	100.0	41	100.0	84	100.0
Smoke &IV	1	2.2			1	1.1								
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.0
4.Money spent on drug per day														
0-100	9	20.0	5	10.6	14	15.2	3	13.0	2	10.0			5	6.0
101-200	17	37.8	5	10.6	22	23.9	11	47.8	4	20.0	5	12.2	20	23.8
201-300	6	13.3	17	36.2	23	25.0	4	17.4	10	50.0	36	87.8	50	59.5
>300	13	28.9	20	42.6	33	35.9	5	21.5	4	20.0			9	10.7
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.0
Median	200		300		300		200		275		300		300	
Mean	272		479		378		286		346		274		295	
Std. Deviation	232		548		434		220		279		47.6		181	
5.Quantity of used per time														
1/2 tablet	12	26.7	10	21.3	22	23.9	2	8.7	3	15.0	5	12.2	10	11.9
<1 tablet	7	15.6	7	14.9	14	15.2	3	13.0	11	55.0			14	16.7
1 tablet	16	35.6	9	19.1	25	27.2	9	39.1	1	5.0	36	87.8	46	54.8
2 tablets	9	20.0	11	23.4	20	21.7	5	21.7	2	10.0			7	8.3
> 2 tablets	1	2.2	10	21.3	11	12.0	4	17.0	3	15.0			7	8.3
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.0
6.Drinking alcohol or not														
No	1	2.2	6	12.8	7	7.6	2	8.7	0	0.0	5	12.2	7	8.3
yes	44	97.8	41	87.2	85	92.4	21	91.3	20	100.0	36	87.8	77	91.7
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.0
7. Have been to treatment centre														
No	40	88.9	31	66.0	71	77.2	19	82.6	19	95.0	38	92.7	76	90.5
yes	5	11.1	16	44.0	21	22.8	4	17.4	1	5.0	3	7.3	8	9.5
Total	45	100.0	47	100.0	92	100.0	23	100.0	20	100.0	41	100.0	84	100.0
8. Have been arrested or not														
No	28	62.2	21	46.7	49	54.4	17	73.9	9	45.0	21	51.2	47	56.0
yes	17	37.8	24	53.3	41	45.6	6	26.1	11	55.0	20	48.8	37	44.0
No response			(2)	-	(2)									
Total	45	100.0	45	100.0	90	100.0	23	100.0	20	100.0	41	100.0	84	100.0

Table A.3.4 Level of addiction

		Matrix Model	FAST Model	Total	Chi-square
1	Increased the quantity of drug use	33.3	46.7	40.3	3.279
2	Tried to stop using drug but unsuccessful	58.3	76.1	67.6	6.320*
3	Used most of time in drug purchased, used and intoxicated	21.4	30.4	26.1	1.845
4	Absented from work or school due to using drug	36.9	45.7	41.5	1.384
5	Used less time with friends due to using drug	20.2	17.4	18.8	0.234
6	Had accident due to using drug	36.9	45.7	41.5	1.384
7	Drug use had effected to psychoproblem	48.8	58.7	54.0	1.728
8	Drug use had effected to family, friends and colleagues	58.3	62.0	60.2	0.241
9	Drug use made unhealthy	50.0	87.0	69.3	28.197**
10	Before attending the treatment, needed to increase drug use as the same amount was not intoxicated	14.3	32.6	23.9	8.114**
11	Needed to use drug to protect withdrawal symptom	13.1	33.7	23.9	10.256**
12	Felt uncomfortable or moody if have to stop using drug	16.7	35.9	26.7	8.272**
	Number	84	92	176	

* Significance at p<.05, **Significance at p<.01

Table A.3.5 Compared the missed followed-up between 1, 3 and 6 months between out-patients (Matrix model) and in-patients (FAST model)

	First follow-up (1 month)					Second follow-up (3 months)					Third follow-up (6 months)				
					T-test					T-test					T-test
Model	N	Mean	Std. Deviation	Std. Error Mean		N	Mean	Std. Deviation	Std. Error Mean		N	Mean	Std. Deviation	Std. Error Mean	
Age on admission (years)															
Out-patient (Matrix)	27	22.48	5.57	1.07	0.481	33	21.85	5.35	0.93	0.006	29	21.14	4.90	0.91	0.050
In-patient (FAST)	22	23.64	5.21	1.11		24	24.13	5.29	1.08		32	24.13	5.03	0.89	
Age first methamphetamine use (years)															
Out-patient (Matrix)	27	18.00	3.86	0.74	1.090	33	17.97	3.69	0.64	1.527	29	17.48	3.01	0.56	1.940
In-patient (FAST)	22	17.59	4.93	1.05		24	17.75	4.80	0.98		32	17.16	4.30	0.76	
Methamphetamine use per day (tablet)															
Out-patient (Matrix)	27	1.11	0.42	0.08	14.147**	33	1.12	0.42	0.07	15.533**	29	1.21	0.49	0.09	13.443**
In-patient (FAST)	19	1.79	1.13	0.26		21	1.76	1.09	0.24		29	2.03	1.27	0.24	
Income per month (baht)															
Out-patient (Matrix)	14	5735.71	2328.95	622.44	4.402*	16	5768.75	2170.01	542.50	5.365*	11	6754.55	2207.43	665.56	3.506
In-patient (FAST)	13	9038.46	5720.80	1586.66		14	8821.43	5556.03	1484.91		19	8973.68	5042.80	1156.90	
Money spent on drug per day (baht)															
Out-patient (Matrix)	27	259.63	112.44	21.64	3.055	33	254.24	110.68	19.27	2.876	29	253.10	127.45	23.67	6.887*
In-patient (FAST)	22	299.55	170.34	36.32		24	293.33	165.60	33.80		32	426.25	448.00	79.20	

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Appendix 4

Survival Analyses

1. The survival function graph comparing between Matrix model (out-patients) and FAST model (in-patients)

Categorical Variable Codings(b)

		Frequency	(1)
PROGRAM(a)	1=Out-patient (Matrix)	63	1
	2=In-patient (FAST)	70	0

a Indicator Parameter Coding
b Category variable: PROGRAM (Model)

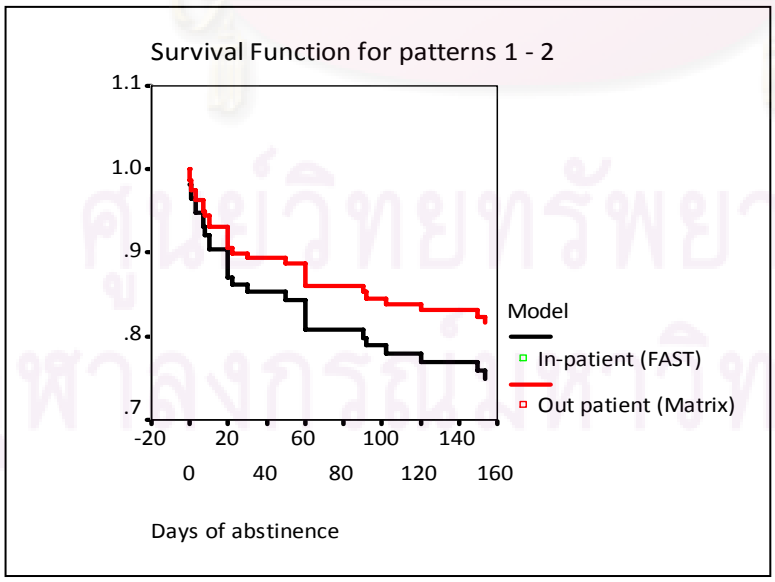
Omnibus Tests of Model Coefficients(a,b)

-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
	Chi-square	df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
264.856	.815	1	.367	.824	1	.364	.824	1	.364

a Beginning Block Number 0, initial Log Likelihood function: -2 Log likelihood: 265.680
b Beginning Block Number 1. Method = Enter

Variables in the Equation

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
PROGRAM	-.348	.387	.807	1	.369	.706	.331	1.508



2. The survival function graph comparing between Treatment Units

Categorical Variable Codings(b)

		Frequency	(1)	(2)
PLACE(a)	1=Chiang Mai DDTC	51	0	0
	2=Thanyarak Institute	49	1	0
	3=Ratchaburi Hospital	33	0	1

a Indicator Parameter Coding
b Category variable: PLACE (Treatment center)

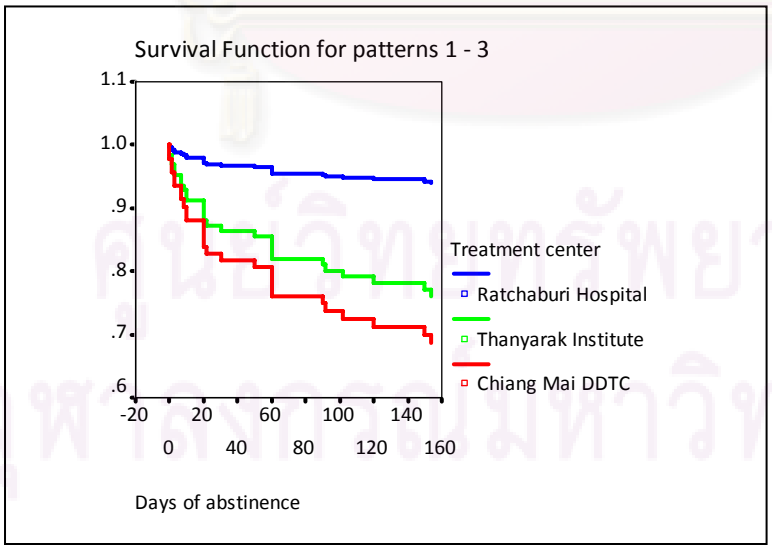
Omnibus Tests of Model Coefficients(a,b)

-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
	Chi-square	df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
257.011	7.089	2	.029	8.669	2	.013	8.669	2	.013

a Beginning Block Number 0, initial Log Likelihood function: -2 Log likelihood: 265.680
b Beginning Block Number 1. Method = Enter

Variables in the Equation

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
PLACE			5.739	2	.057			
PLACES5(1)	1.792	.753	5.659	1	.017	6.002	1.371	26.279
PLACES5(2)	1.472	.769	3.661	1	.056	4.357	.965	19.678



3. The survival function graph comparing between Treatment Units when general characteristics and models are controlled.

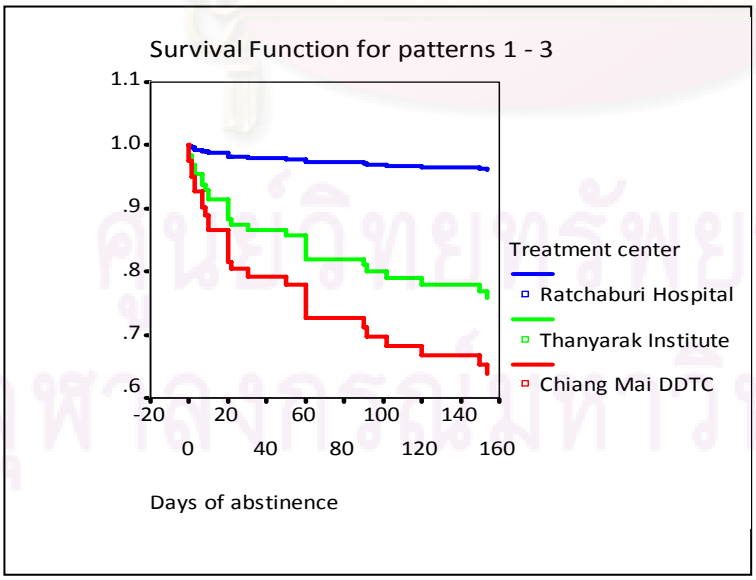
Omnibus Tests of Model Coefficients(a,b)

-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
	Chi-square	df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
252.440	11.348	7	.124	12.746	7	.079	12.746	7	.079

a Beginning Block Number 0, initial Log Likelihood function: -2 Log likelihood: 265.186
b Beginning Block Number 1. Method = Enter

Variables in the Equation

	B	SE	Wald	df	Sig.	Exp(B)
Age on admission (AGE)	.021	.036	.339	1	.560	1.021
Education status (EDURECOD)	-.272	.278	.960	1	.327	.761
Marital status (MARITAL_	-.742	.563	1.738	1	.187	.476
Household status (HHSTGR)	-.534	.495	1.164	1	.281	.586
Models	-.718	.475	2.284	1	.131	.488
PLACE			7.570	2	.023	
PLACES5(1)	2.441	.888	7.557	1	.006	11.485
PLACES5(2)	1.962	.839	5.467	1	.019	7.115



4. The survival function graph comparing between the Matrix and FAST model of Treatment Units when general characteristics are controlled.

Categorical Variable Codings(b)

		Frequency	(1)	(2)	(3)	(4)
PLACES5(a)	1=Ratchaburi Matrix	32	0	0	0	0
	2=Chiang Mai FAST	41	1	0	0	0
	3=Thanyarak FAST	29	0	1	0	0
	4=Chiang Mai Matrix	10	0	0	1	0
	5=Thanyarak Matrix	20	0	0	0	1

a Indicator Parameter Coding
b Category variable: PLACES5

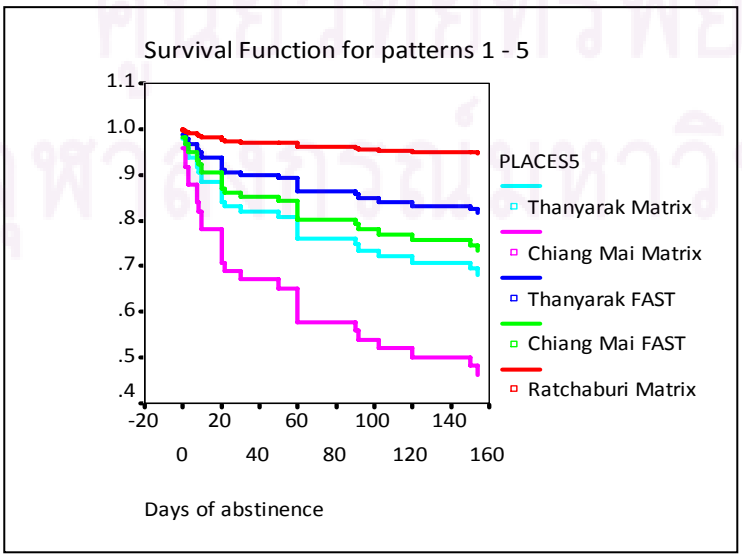
Omnibus Tests of Model Coefficients(a,b)

-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
	Chi-square	df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
251.391	12.719	9	.176	13.795	9	.130	13.795	9	.130

a Beginning Block Number 0, initial Log Likelihood function: -2 Log likelihood: 265.186
b Beginning Block Number 1. Method = Enter

Variables in the Equation

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
AGE	.032	.038	.721	1	.396	1.033	.959	1.112
EDURECOD	-.290	.283	1.053	1	.305	.748	.430	1.302
MARITAL	-.672	.580	1.345	1	.246	.511	.164	1.590
HHSTGR	-.497	.509	.954	1	.329	.608	.224	1.650
EMPLOYMENT	-.477	.457	1.088	1	.297	.621	.254	1.520
PLACES5			8.017	4	.091			
PLACES5(1)	1.705	.784	4.726	1	.030	5.501	1.183	25.585
PLACES5(2)	1.288	.847	2.313	1	.128	3.626	.689	19.066
PLACES5(3)	2.616	.984	7.059	1	.008	13.675	1.986	94.168
PLACES5(4)	1.922	.865	4.938	1	.026	6.832	1.255	37.211



5. The survival function graph comparing between the Matrix and FAST model of Chiang Mai DDTC and Thanyarak Institute when general characteristics are controlled using Ratchaburi Hospital as the baseline.

Categorical Variable Codings(b)

		Frequency	(1)	(2)
PLACES3(a)	1=Ratchaburi Matrix model	32	1	0
	2=Chiang Mai and Thanyarak FAST model	70	0	1
	3= Chiang Mai and Thanyarak Matrix model	30	0	0

a Indicator Parameter Coding
b Category variable: PLACES3

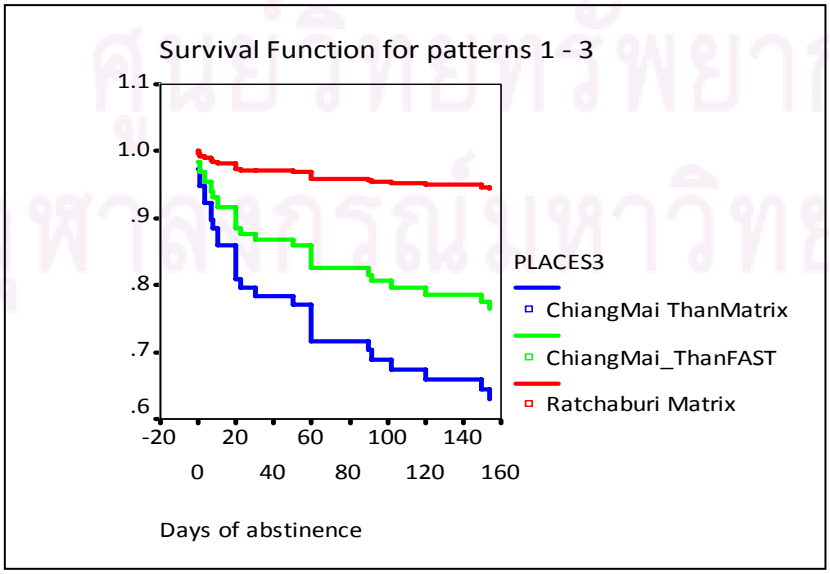
Omnibus Tests of Model Coefficients(a,b)

-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
	Chi-square	df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
252.797	11.088	7	.135	12.389	7	.088	12.389	7	.088

a Beginning Block Number 0, initial Log Likelihood function: -2 Log likelihood: 265.186
b Beginning Block Number 1. Method = Enter

Variables in the Equation

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
AGE	.021	.037	.317	1	.573	1.021	.949	1.098
EDURECOD	-.286	.286	.997	1	.318	.751	.429	1.317
MARITAL	-.724	.567	1.628	1	.202	.485	.159	1.474
HHSTGR	-.551	.499	1.218	1	.270	.576	.217	1.533
EMPLOYMENT	-.415	.443	.877	1	.349	.661	.277	1.573
PLACES3			6.358	2	.042			
PLACES3(1)	-2.088	.831	6.315	1	.012	.124	.024	.632
PLACES3(2)	-.549	.444	1.530	1	.216	.577	.242	1.379



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