A STUDY ON AMPHETAMINE TYPE STIMULANT (ATS) USERS IN SELECTED STATES IN MALAYSIA

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A STUDY ON AMPHETAMINE TYPE STIMULANT (ATS) USERS IN SELECTED STATES IN MALAYSIA

by

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ATS	Amphetamine Type Stimulant
CCSC	Cure and Care Service Centre
DAT	Dopamine Transporter
HCV	Hepatitis-C Virus
HIV	Human Immunodeficiency Virus
IDU	Injecting Drug User
MDG	United Nations Millennium Development Goal
MSM	Men Who Have Sex with Men
NADA	National Anti-Drug Agency
NADI	National Drug Information System
NET	Noradrenaline Transporter
PWID	People Who Inject Drugs
PWUD	People Who Use Drugs
UNODC	United Nations Office on Drugs and Crime
SERT	Serotonin Transporter
VMAT-2	Vesicular Monoamine Transporter-2

SATU KAJIAN BERSAMA PENGGUNA AMPHETAMINE TYPE STIMULANT (ATS) DI NEGERI-NEGERI TERPILIH DI MALAYSIA

ABSTRAK

Terdapat peningkatan yang ketara dalam bilangan orang yang menggunakan Amphetamine type Stimulants (ATS) di Malaysia sejak beberapa tahun yang lalu. Data yang sedia ada hanya merujuk kepada bilangan pengguna ATS yang ditangkap serta rampasan ATS oleh agensi-agensi penguatkuasa. Terdapat keperluan untuk memahami konteks penggunaannya oleh pengguna. Oleh itu kajian ini bertujuan untuk mengenal pasti ciri sosio-demografi pengguna ATS, untuk memahami konteks penggunaan dadah di kalangan pengguna dadah ATS, untuk mengenal pasti tingkah laku seksual mereka dan juga untuk menentukan beberapa masalah kesihatan yang dikaitkan dengan penggunaan ATS di Malaysia. Satu kajian keratan rentas telah dijalankan bersama 118 pengguna utama ATS di negeri Pulau Pinang, Kuala Lumpur, Selangor dan Johor Baharu. Teknik persampelan bertujuan telah digunakan untuk merekrut subjek kajian dan soal selidik digunakan sebagai instrumen kajian bagi mengumpul data. Ujian saringan air kencing bagi dadah jenis opioid, methadon, bezodiazepine, ketamin, methampetamine, amphetamine dan ganja telah dijalankan bertujuan bagi menentukan status pengguna dadah serta untuk mengesahkan maklumat laporan sendiri penggunaan dadah subjek kajian. Statistik deskriptif dan ujian Pearson's chi-square telah di gunakan bagi mengesahkan hubungan signifikan antara dua kumpulan. Ciri sosio-demografi subjek kajian adalah seperti berikut: min umur 33.1; 81% lelaki, 9% perempuan manakala 10% transgender; 71% Melayu, Cina 22%; India 7%; kebanyakan bekerja;

majoriti menerima pendidikan selama sembilan hingga sebelas tahun; 61% tidak berkahwin. Terdapat dua kumpulan pengguna dadah yang berbeza. Kumpulan yang pertama terdiri daripada mereka yang hanya menggunakan dadah ATS sahaja, manakala kumpulan yang kedua menggunakan dadah ATS bersama dadah-dadah lain. Hampir separuh daripada mereka telah menggunakan dadah ATS lebih dari 5 tahun, kebanyakan daripada mereka juga dilaporkan menggunakan dadah ATS satu hingga dua kali sahaja dalam seminggu. Perkara ini seterusnya disahkan melalui analisa sekunder dimana tiada perbezaan diantara pengguna jangka pendek dan pengguna jangka panjang. Kebanyakan pengguna dadah ATS melaporkan bahawa mereka menggunakan ATS dengan cara menghisap/menyedut dan penyuntikan ATS agak rendah dengan 10%. Kadar jangkitan HIV dalam kajian ini adalah 7%. Peratusan tinggi daripada subjek kajian melaporkan bahawa mereka terlibat baru-baru ini (30 hari) dalam tingkah laku jenayah. Satu perlima daripada mereka masih aktif dalam seks dimana mereka dilaporkan mempunyai lebih dari satu pasangan seks dalam tempoh 30 hari yang lalu. Penggunaan kondom juga rendah dimana sebanyak 17% daripada mereka tidak menggunakan kondom bersama pasangan kasual dan pekerja seks. Analisa sekunder juga menunjukkan bahawa yang menggunakan ATS hanya menggunakan dadah ATS sahaja mempunyai kecenderungan tinggi untuk menjadi aktif secara seksual berbanding mereka yang menggunakan dadah lain. Lebih daripada suku subjek kajian dilaporkan mengalami sedikit masalah kesihatan disebabkan penggunaan ATS dan tiga perempat melaporkan mengalami masalah psikologikal. Kumpulan pengguna ATS sahaja dilaporkan untuk mempunyai kemungkinan yang tinggi untuk mengalami halusinasi dan ia lebih jelas dikalangan penguna jangka panjang dimana mereka dilaporkan mengalami kelemahan fizikal. Masalah kesihatan lain yang dilaporkan adalah masalah insomnia. Kebanyakan daripada

responden juga dilaporkan mengalami keinginan yang tinggi untuk menggunakan ATS. Kajian ini telah menyumbang kepada kefahaman siapa pengguna dadah ATS ini sebenarnya, bagaimana dadah ini digunakan dan juga sedikit masalah kesihatan yang dialami disebabkan penggunaan dadah ATS. Data kajian ini memberikan kefahaman yang lebih baik terhadap masalah ini jika dibandingkan dengan sebelum ini hanya terdapat data rampasan dan tangkapan sahaja.

A STUDY ON AMPHETAMINE TYPE STIMULANT (ATS) USERS IN SELECTED STATES IN MALAYSIA

ABSTRACT

There has been a tremendous increase in the number of people using Amphetamine Type Stimulants (ATS) in Malaysia over the last several years. The current data available is only on the number of ATS users arrested and seizure of ATS by enforcement agencies. There is a need to understand the context of its use by these users. Therefore the study aimed to identify the socio-demographic characteristics of ATS users, to understand the context of drug use among ATS drug users, to identify their sexual behaviors and to determine some of the medical health problems linked to ATS use in selected states in Malaysia. A cross-sectional survey was conducted among 118 primary ATS users in Penang, Kuala Lumpur, Selangor and Johor Bahru. A purposive sampling technique was used to recruit study participants and a questionnaire was used as the survey instrument to collect data. Urine toxicology screen for opiates, methadone, benzodiazepines, ketamine, methamphetamine, amphetamine and cannabis was conducted to objectively determine the drug use status and also to validate the self-report of current drug user data. Descriptive statistics and Pearson's chi square test was conducted to determine the significance between the two groups. The socio-demographic characteristics of the patients are as follows; mean age 33.1 years, 81% males, 9% females and 10% transgender; 71% Malay, Chinese 22%, Indian 7%; mostly employed and majority had nine to eleven years of education, 61% single. There are two distinct groups of drug users. The first group consists of those who only use ATS drugs

and another group who use ATS together with other drugs. More than half of them have been using ATS for more than five years and most of them also report to use ATS only one to two days a week. This is further confirmed in the secondary analysis where there is no difference between short term and long term users. Most of the users reported that they use ATS by smoking/snorting it and injecting ATS is relatively low at 10%. HIV infection rate reported in this study is 7%. High percentage of respondents reported that they were involved in recent (30 days) criminal behavior. One fifth of them were sexually active where they reported to have more than one partner in the last 30 days. Condom use was also on the low side where a total of 17% of them did not use condom with a casual and sex worker. The secondary analysis also showed that those who only used ATS were more likely to be sexually more active than those who used other drugs. Slightly more than a quarter of the respondents reported to have experienced health problems related to ATS use while three quarter of them reported to have experienced some psychological problems. The ATS only group of respondents reported to have higher odds of experiencing hallucinations and it is more apparent with long-term use where they are also reported to experience physical weakness. The other health problems reported were insomnia. A high proportion of the respondents also reported to experience intense craving for ATS. This study has contributed to a better understanding of who are these ATS users, how the drugs are used and some of the health problems experienced as a result of ATS use. This data provides a better understanding to the problem compared to previously where only seizure and arrests related data was available.

CHAPTER 1

INTRODUCTION

1.0 Introduction

The first chapter of the thesis will provide an introduction to the drug abuse problem in Malaysia and specifically discuss the problem of Amphetamine-Type-Stimulant (ATS) use in the country. This will be followed by the research problem where the justification to conduct this study will be made. In this chapter, the research objectives of the study, the scope of the study, the significance of the study, the limitation of the study and outline of each chapter will be discussed.

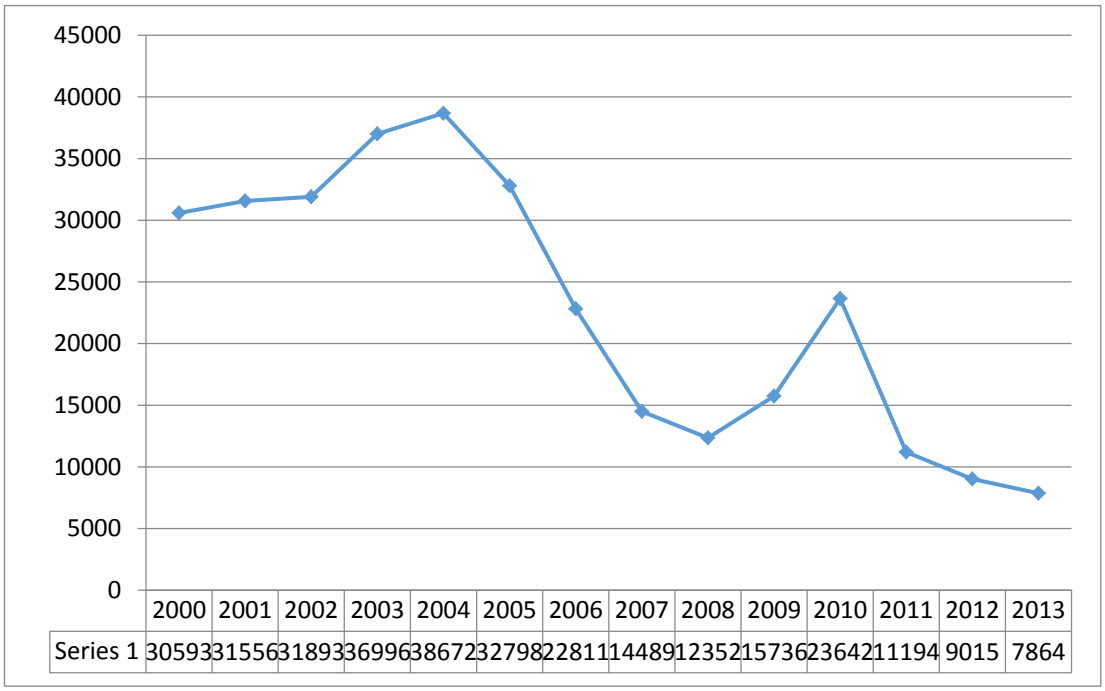
1.1 Brief Overview of the World Drug Problem

United Nations Office on Drugs and Crime (UNODC) estimated that in 2013, 246 million people or 1 of 20 people between the ages of 15 to 64 years old used an illicit drug in 2013 (UNODC, 2015). This is an increase of 3 million users compared to the previous year. The use of opiates remained stable and the use of cocaine declined, while the use of cannabis and non-medical pharmaceutical opioids continued to rise. Trends in ATS use vary from region to region but South and East Asia reported an increase in methamphetamine use. Seizures of ATS continue to rise since 2009 where total quantity seized reaching over 144 tons in 2012 and 2013. The burden of HIV among people who inject drugs (PWID) continues to be high globally. The number of people who require treatment for ATS use is on the rise, but the expertise available is still low compared to expertise available for opiate users (UNODC, 2015).

1.2 Drug Abuse Problem in Malaysia

From 1980s to around 2003 Malaysia's drug policy was based solely on a prohibitionist approach. Non-medical institutional rehabilitation approach was the main modality for rehabilitating people who use drugs (PWUD). High relapse rates within the first six months of release were reported. Malaysia's failure to reverse an increasing trend of HIV infection in the United Nations Millennium Development Goal (MDG) prompted the Malaysian government to re-examine its approach towards people who use drugs. Figure 1.1 show the number of people who use drugs (PWUD) from year 2000 to 2013. These numbers represent people who have been certified as drug dependents by the National Anti Drug Agency. While it seems that the number of drug dependents detected has been going down from 23,642 people in 2010 to 7,864 people in 2013 this may be due to the introduction of harm reduction programs in 2004. There has been a shift in paradigm on how drug users are viewed by the government (section below provides more details). Authorities are not arresting drug users as frequently and hence the reduction in the numbers of drug users detected (see Figure 1.1). More drug users are now being encouraged to enroll in treatment programs. Hence, the number of drug users detected as shown in Figure 1.1 may not reflect the actual situation of the drug problem in the country.

Figure 1.1 Number of people who use drugs (PWUD) detected by the National Anti Drug Agency (NADA) from year 2000-2013.

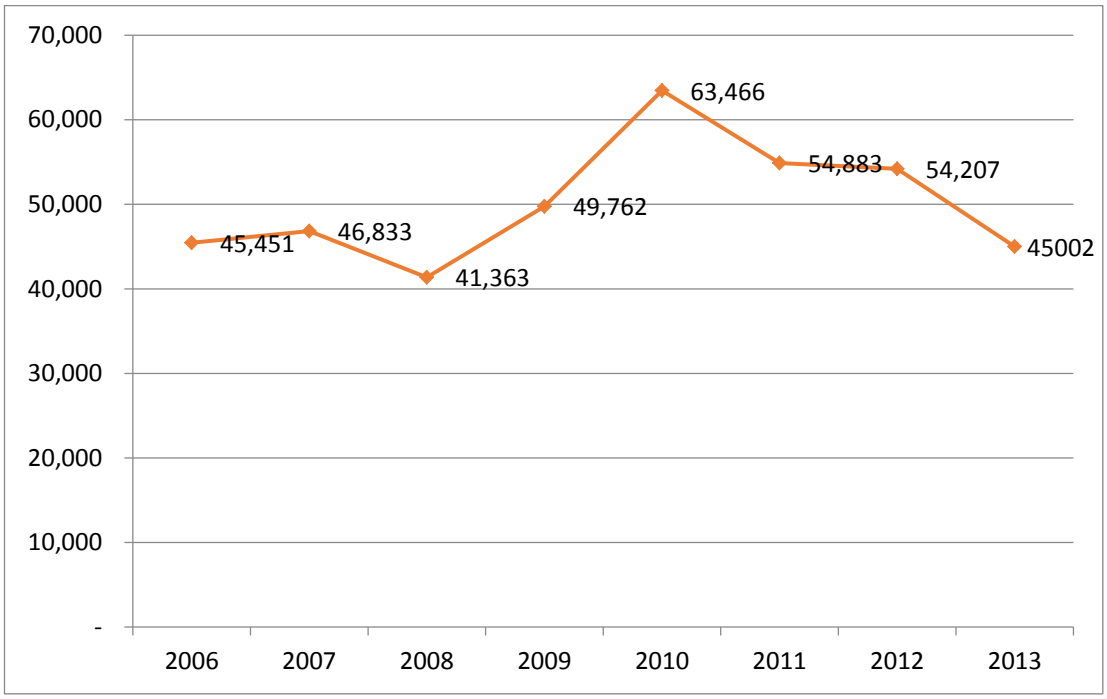


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Series 1	30593	31556	31893	36996	38672	32798	22811	14489	12352	15736	23642	11194	9015	7864

Source: National Drug Information System 2013.

Figure 1.2 show the arrest under section 3(1) Drug Dependents (Treatment and Rehabilitation) Act, 1983 related to opiate and cannabis drug use from 2006-2013. There is a general decrease in the number of arrests made for these drugs between 2010 (63,466) to 2013 (45,002).

Figure 1.2 Arrest under section 3(1) Drug Dependents Act (Treatment and Rehabilitation) 1983, related to opiate and cannabis drug use from 2006-2013.



Source: Royal Malaysia Police (2014).

1.3 Classification of ATS Drugs for this Study

ATS or Amphetamine-Type-Stimulant drugs that are commonly used in Malaysia are amphetamine and methamphetamine. Some of the street names used for these drugs are *syabu* and *ice*. In this study both these drugs will be classified as ATS.

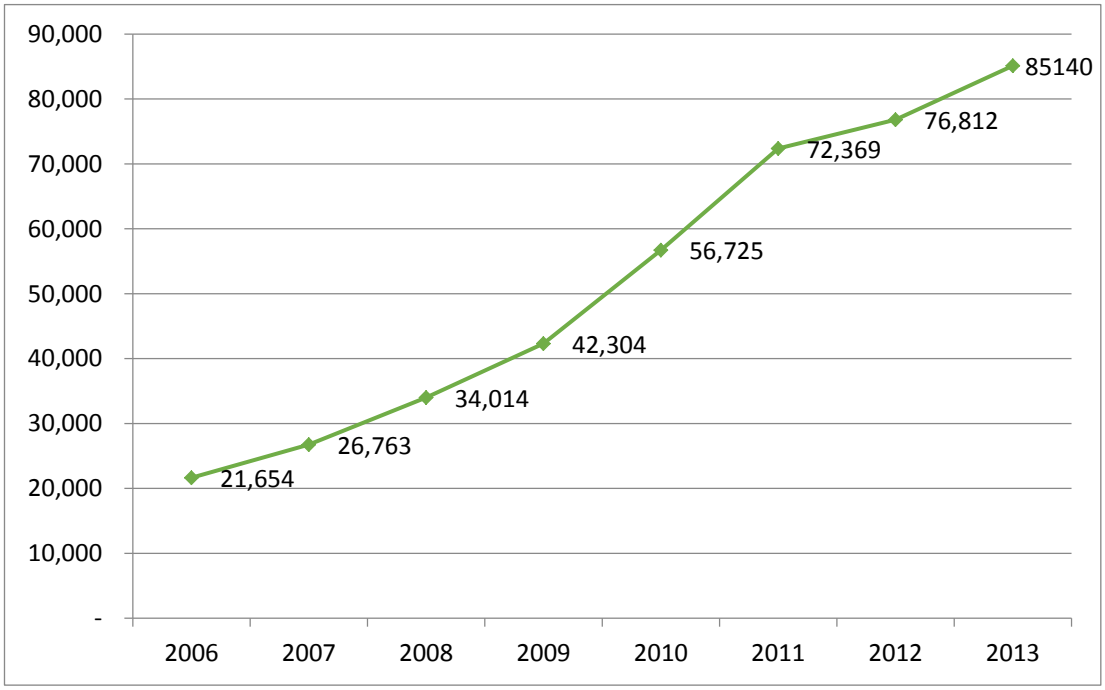
1.4 Trends of ATS in Malaysia

Malaysia has had a problem traditionally with heroin users and lately in the last 8 years there has been a substantial increase in the number of ATS users in the country. All ATS users are charged under section 15 (1) of the Dangerous Drug Act. The section is for entering drugs into the body. The reason why police are charging these users under this section is because while this drug causes damaging effects it

does not show clear physical withdrawal symptoms. For a drug user to be certified a drug "dependent" a medical officer has to examine the drug user for symptoms of addiction and certify that an individual is a "drug dependent". With this group of synthetic drugs, medical officers are unable to observe for these symptoms hence the police having no option but to charge these users under section 15(1).

It is interesting to note that arrests under section 15 (1) (a) which is for using ATS and ketamine has been increasing since year 2006. In figure 1.3, the arrests for these drugs are almost four-fold where in 2006, 21,653 arrests were made and in 2013, 85,140 arrests were recorded. This is a sign of increase in the use of ATS in the country. These drugs are becoming more prevalent in most parts of the country and it has also created a new 'class' of drug users. The socio-demographic characteristics of these users are not well established. The data collected by the government only provide the number of people who are using ATS but the contextual use and other health related consequences are not well understood.

Figure 1.3: Arrest under section 15(1)(a) Dangerous Drug Act 1952 (DDA) related to Amphetamine-Type-Stimulant (ATS) and Ketamine Drug use from 2006-2013.



Source: Royal Malaysia Police (2014).

Table 1.1 shows the drug seizures in the country between 2011 and 2014. Seizures of liquid methamphetamine increased considerably from 76.69kg in 2013 to 1,260kg in 2014. The seizure of *yaba* which are metamphetamine and caffeine pills also shows an increasing trend from 364,879 pills seized in 2011 to 557,336 pills in 2014.

Table 1.1 Drug Seizures in Malaysia from 2011 to 2014**.**

Types of Drugs		2011	2012	2013	2014
Heroin	kg	445.13	362.67	638.61	381.40
Cannabis	kg	796.05	751.80	539.30	578.19
Crystal methamphetamine	kg	830.29	608.67	1245.63	761.71
Liquid methamphetamine	kg	122.60	27.96	76.69	1,260.09
Ketamine	kg	106.75	118.07	139.23	216.61
Amphetamine powder	kg	26.53	457.36	674.62	53.69
Ecstasy	pills	47,761	634,573	335,984	117,702
Yaba	pills	364,879	521,384	524,966	557,336
Erimin 5	pills	87,012	5,175,069	177,916	467,133

Source: Royal Malaysia Police 2015.

1.5 ATS Drugs

Amphetamine includes S-amphetamine (i.e. d-amphetamine; also referred to as dexamphetamine) which is used therapeutically, and racemic amphetamine sulphate powder, which is the common form of amphetamine used illicitly in the United Kingdom (Cruikshank and Dyer, 2009). Methamphetamine is an indirect agonist at dopamine, noradrenaline and serotonin receptors. Due to structural similarity, methamphetamine substitutes for monoamines at membrane-bound transporters, namely the dopamine transporter (DAT), noradrenaline transporter (NET), serotonin transporter (SERT) and vesicular monoamine transporter-2 (VMAT-2). (Sulzer et al., 2005). Cruikshank and Dyer (2009) published a fairly comprehensive review paper on the pharmacology of methamphetamine which also includes the effects and significant clinical effects of methamphetamine. McKetin et al (2008) provides an Asian regional review on the epidemiological trends of

methamphetamine. Both these papers are sufficient to show the effects of ATS and how there is a lack of behavioral data on ATS regionally.

1.6 Brief Overview of Studies Related to ATS Abuse

ATS abuse is a major problem in many regions of the U.S. Globally, it is now the second most commonly used illicit drug type and, along with heroin IDU, contributes substantially to HIV transmission in regions where the epidemic is most severe, including Malaysia and many other countries in Southeast Asia. Over the past decade, laboratories producing ATS have been identified in more than half of the countries in the region; large scale laboratories capable of industrial-scale manufacture have been found in many of the countries (including China, Malaysia, and Indonesia); and an estimated 1% of individuals age 15-64 years in the region used ATS in the past year (UNODC, 2009). Surveys of IDUs conducted in a number of sites in Malaysia found lifetime ATS use in 57% of heroin IDUs and lifetime needle or equipment sharing in 69%; 44% tested positive for HIV; 67% tested positive for HCV, and lifetime history of ATS abuse was significantly associated with HIV infection (Vicknasingam et al., 2009; Vicknasingam et al., 2009a and Vicknasingam et al., 2009b). In another local study by Sulaiman et al (2014) found that heavy methamphetamine use was significant with methamphetamine induce psychosis. Lim et al (2015) conducted a study among men who have sex with men (MSM) and found that ATS use among this population is associated with high risk HIV behaviors.

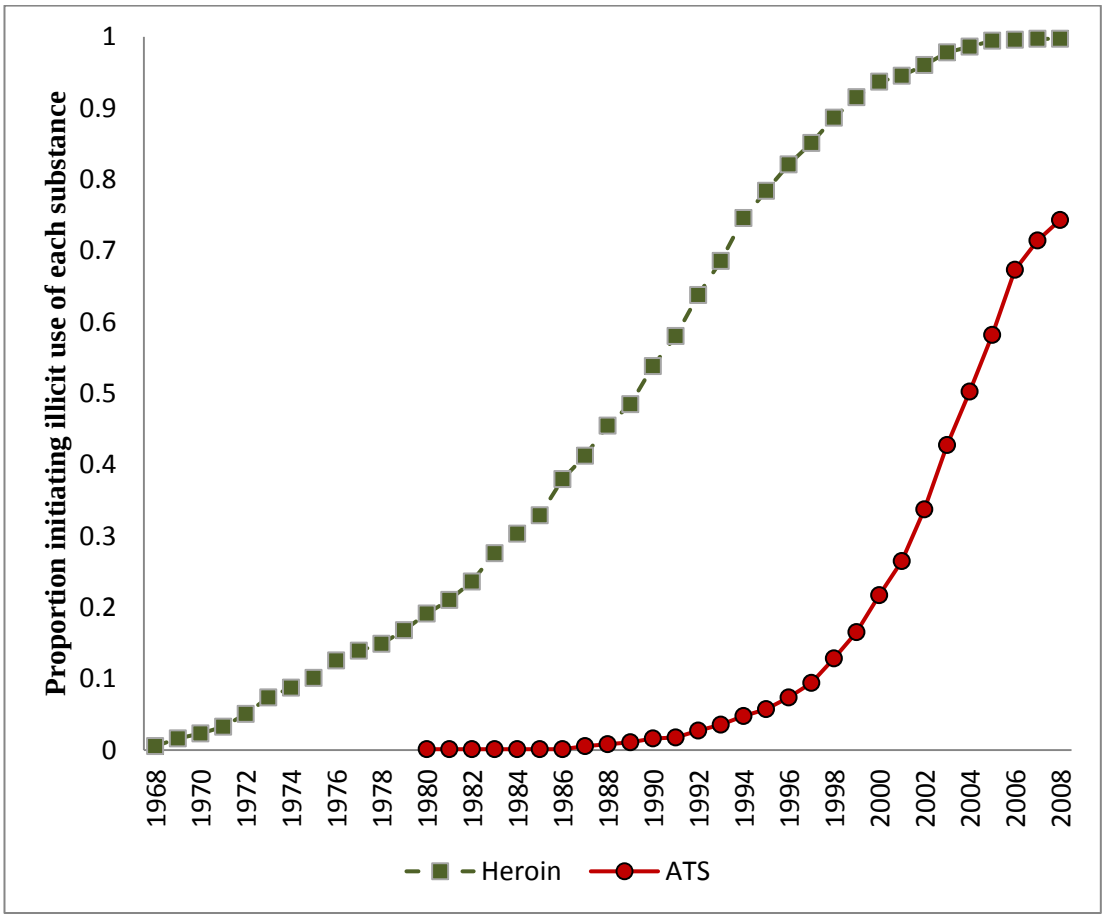
1.7 Problem Statement

The National Drug Information System was designed during the heroin epidemic. Drug policies with regard to treatment and rehabilitation were mostly also

formulated during the heroin epidemic. Hence, the drug information system and policies are more geared to deal with the heroin problem. With the emergence of ATS the systems and policies currently available are unable to effectively track, monitor and understand the context and patterns of ATS use in the country. This is evident where in Figure 1.1 which is the data produced by the National Drug Information System, the arrests made by police in Figure 1.3 is not captured to reflect the seriousness of ATS use in the country. The police on the other hand without much of a choice are charging drug users under section 15(1) which is for entering drugs into the body purely because they are unable to charge them under section 3(1) which is for heroin use because under this Act a medical officer will have to certify that an individual is a drug dependent. Under section 3(1) drug users are normally sent for treatment while ATS users charged under section 15(1) can be sent to prison and fined. This current situation is not beneficial for those detained using ATS since they will not be given the opportunity to enroll in treatment programs.

In addition to this, currently there is no data on the behavioral characteristics of ATS drug users in the country. Data on the number of ATS drug users arrested is only available and in addition Chawarski et al (2012) conducted a survey among 732 opiate injecting drug users (IDUs) in Malaysia and found that the cumulative proportion of the survey participants initiating heroin use increased steadily beginning in the late 1960s. The number of participants initiating ATS use increased rapidly after 1997 and by 2008, 75% of the participants had initiated ATS use. More important is to understand the context of use in the social environment. With these understanding, effective interventions in the form of prevention and treatment programs can be put in place.

Figure 1.4 Time line of drug use initiation.



(Chawarski et al, 2012).

The high cost of these drugs and its stimulants properties may encourage users to commit crime to sustain their behavior. ATS use is also linked to high-risk behaviors (McKetin et al., 2008; Mazlan et al., 2009; Vicknasingam et al., 2009). The link between ATS use and high-risk sexual behavior is also not well established. The danger with these drugs is that if it is used for a prolonged period it can cause severe mental problems. However, the context of use in relation to high risk behavior is not well understood in the country. For example, how is the drugs used, are the drugs and equipment shared, the sexual behavior of ATS users, etc has not been studied. Based on the reasons stated above, three research questions are posed to gain a better understanding on the behavioral characteristics of ATS drug users in

Malaysia.

1.8 Research Questions

1. What are the socio-demographic characteristics of ATS drug users in Malaysia? As from experience in conducting studies with drugs users and also from discussions with the police, NGOs and National Anti-Narcotics Agency, it was found that the socio demographic characteristics of ATS drug users are not well documented. The National Drug Information System (NADI) primarily only captures opiate drug users in the system. Currently, there are no data to show the socio demographic characteristics of these users. These data will be useful as it will be able to have a profile of these users in the country.
2. What are the behavioral characteristics of ATS drug users in Malaysia? This study will specifically attempt to understand the behavioral characteristics of these users *vis a vis* HIV risk behavior. The two main high risk behaviors that will be investigated are their drug use practices and sexual behavior. For example questions on mode of drug administration, context of drug use, frequency of condom use, number of sexual partners, etc will be elicited in the survey.
3. What are the medical health problems or consequences faced by ATS drug users in the country? There are evidences to show that ATS drug users have higher risks of encountering medical problems as a result of their drug use. Specifically, an attempt will be made to understand the mental health problems faced by these users. In addition, participants will be asked if they have seek treatment for their drug use and also their medical problems.

1.9 Objectives of the Study

1. To identify the socio-demographic characteristics of ATS users in Malaysia.
2. To understand the context of drug use among ATS drug users in Malaysia.
3. To identify the sexual behaviors of ATS drug users in Malaysia.
4. To determine some of the medical health problems linked to ATS use in Malaysia.

1.10 Scope of Study

This study is aimed at identifying the socio-demographics and behavioral characteristics of ATS users in the country. A cross-sectional study design was used to collect data among people who reported to use ATS as their primary drug. The study was conducted in four states (Penang, Selangor, Kuala Lumpur and Johor) of the west coast of peninsular Malaysia.

1.11 Significance of Study

Section 1.2, 1.4 and 1.6 provide the background to Malaysian drug problem, national data on ATS use in the country and relevant studies that have been conducted among ATS users. The national data only shows that number of ATS users arrested and does not provide the contextual use and behavioral characteristics of ATS users. Studies by Vicknasingam et al (2009, 2009a and 2009b) and Chawarski et al (2012) were conducted primarily among opiate drug users. Sulaiman et al (2014) studied the psychiatric condition of ATS users who were in treatment or in rehabilitation centers. While Lim et al (2015) studied specifically the MSM population. To my knowledge, this is the first study that surveyed not in treatment primary ATS users in the country. Participants were recruited in the

community and were surveyed to obtain their socio-demographics, understand their contextual ATS use and also their behavioral characteristics. It is hoped that this study will help to better understand the characteristics of ATS users in the country. In addition, the data from this study can be used to plan for more effective interventions among this group of drug users. Data on the behavioral characteristics of ATS users will also be helpful to plan specifically for psychosocial interventions since there are currently no effective medications to treat ATS dependence. Perhaps, some of the questions in the questionnaire of this study can be adopted and used as questions by the National Anti-Drug Agency (NADA) when they are assessing ATS users. This will allow NADA to conduct a better assessment and hence come up with better interventions for their clients who are assessing their services in the Cure and Care Service Centre's (CCSC) nationwide.

1.12 Study Limitation

Drug use is illegal hence drug users normally will use drugs in clandestine settings. Drug users are a hidden population where they live among us in society but they are difficult to identify. As drug use is illegal, obtaining a population size is not possible and using probabilistic sampling techniques is also not possible. This study relied on non-probabilistic sampling technique to collect data and this may limit the representativeness of study findings. Self-report data collected may also have some recall bias weakness and this may affect the accuracy of the data. Measures were taken to only conduct the survey among current users where recall bias is minimized. Self-report of participants experiences with regard to their health problems may be compounded by problems that may have arisen from other non-drug use medical conditions or consequences from other drugs (non ATS). Since there were no clinical

examinations or tests conducted we are unable to objectively determine the accuracy of these self-reported medical consequences of ATS use. These self-reported findings are however discussed with other published literature to corroborate the findings.

1.13 Thesis Presentation

The thesis consists of six chapters. The first chapter is the introduction chapter of the thesis where the topic of the study is introduced and a brief literature review is provided to give the reader an overall idea to the thesis. The brief literature review will also justify why this study is important to be undertaken and hence a section on the statement of problem justifying the conduct of this study. This is followed by the research questions that this study is set out to do and what are the objectives that this study hopes to achieve. The scope of the study is also described in this chapter and the significance or what is the contribution of this study is explained. The study limitation is also in the first chapter to provide the reader with an understanding of what the constraints were in terms of the study design as well as the limitation encountered during the implementation of the study.

The second chapter of the thesis is the literature review chapter. In this chapter, the world drug problem and the Malaysian drug problem with an emphasis to amphetamine type stimulants (ATS) is discussed. This is followed by what is and also the classification of ATS. A brief discussion on the pharmacology of ATS, its effects on humans and linking the various concepts of drug use disorders to ATS is discussed in this chapter. A review of the behavioral characteristics of ATS use from the various studies conducted is also useful to understand and also helped design the questionnaire for this study.

The third chapter consists of the methods used in this study. The study design used and the justification for its use are discussed. The sample, sample size and how the samples or study participants were recruited are all described in detail. The inclusion and exclusion criteria of the study participants are listed. The study instrument used in this study and the various sections in this instrument as well as the source of where some questions were obtained are detailed. The implementation of the study using survey techniques and specific locations where data was collected is also presented here. Procedures how urine specimens were collected and the types of illicit drugs that participants were tested for are listed. The ethical issues and potential risks for taking part in this study as well as compensation for taking part in this study is all described clearly in this chapter. Finally, how the collected data was managed and analyzed are explained here.

Chapter four is the results of the study. This chapter is divided mainly into two main parts where the first part describes the frequency of the data. In this first part, the socio-demographics of the participants, urine drug toxicology screen results, drug use and other behavioral characteristics of the participants are presented in frequency tables. This is followed by the health consequences of ATS use. Statements using a likert scale to measure physical and psychological symptoms, intensity of craving for ATS and the motivation to change are also described using frequency tables in the first part of this chapter. In the second part of this chapter, secondary analysis looking at variables that are significant are presented and discussed.

Chapter five is the discussion chapter where all the study results are discussed. The format of discussion in this chapter is done with regard to the

objectives of this study. The results are discussed with the relevant literature to highlight the importance of the results and to also show if the findings of this study are similar or different to other studies.

The last chapter is the conclusion chapter where all the results are summarized and concluded. The implication of this study and the lessons learnt are discussed in this chapter for the benefit of other researchers.

1.14 Conclusion

The first chapter of the thesis provides an overview to highlight the importance of conducting this study. Based on this the research questions and objectives of this study is described in this chapter. More extensive discussion on the drug problem in the world and the country as well as discussion on the extent of ATS use and its dangers are discussed in chapter two of the thesis.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This chapter will discuss all the relevant literature with regard to this thesis. Some of the earlier sections in this chapter will be repetitive topics from chapter 1, but in this chapter a more in-depth discussion with the literature will be done to ensure all relevant and current literature are discussed.

2.1 World Drug Problem

In 2013, an estimated a quarter million people with a global prevalence of 5.2% have used an illicit drug (UNODC, 2015). While the absolute number of drug users has increased this has also corresponded with the increase in the world's population hence this increase is considered stable and this has been the trend over the last three years. In terms of types of drugs used, cannabis use continues to rise globally since 2009, but the use of opioids which includes heroin, opium are stable. Overall, the use of cocaine and amphetamines has declined but this is mainly due to the trends reflected in Americas and Europe. In the section below, a closer look at the trends in Asia will provide a better picture to the problem of ATS use in Malaysia.

The burden of HIV among people who inject drugs (PWID) continues to be high globally with a prevalence of 13.5%. By region, Europe has the highest prevalence (12.6%) mainly because of Eastern Europe, followed by Asia (12.6%), Africa (11.2%),

America (8.4%) and Oceania (1.0%). The figures are more alarming for hepatitis C, where every other person who injects drugs is living with hepatitis C (UNODC, 2015). Worldwide, deaths among drug users are primarily related to drug overdose. It is estimated that 187,100 were drug related deaths in 2013. Specifically, heroin related overdose has increased exponentially from 3,036 in 2010 to 8,527 in 2013 (Hedegaard et al., 2015).

2.2 Amphetamine Type Stimulants (ATS) Problem in Asia

ATS drugs have joined opioids and cannabis as the most commonly drugs misused in the world today (UNODC, 2015). Southeast and East Asia have emerged as the main drug producing and trafficking centre of the world in the last decade (UNODC, 2007, Kozel et al., 2006 and Kozel et al., 2007). In the last two decades, ATS and ketamine use have increased tremendously and providing treatment for these groups of users continues to be a challenge. Methamphetamine is available in crystalline and tablet form. The crystalline form is reported to be more potent. It is estimated that more than half of the world's ATS users reside in Asia (UNODC, 2007). ATS dominates the synthetic drug market in Asia. United Nations Office on Drugs and Crime (UNODC) estimates that in Asia and Oceania there are 9.5 million methamphetamine users and another 3.9 million ecstasy users. In Asia and Oceania seizures of ATS have increased from 12 tons in 2008 to 48 tons in 2013 (UNODC, 2015a).

China, Cambodia, Brunei, Singapore, Vietnam, Philippines and Korea recorded an increase in the use of crystalline methamphetamine in 2013. While, methamphetamine tablets increased in Cambodia, China, Myanmar, Vietnam, Thailand

and Laos during the same period (UNODC, 2015a). Methamphetamine users receiving treatment is also increasing in the region. China, Philippines and Myanmar recorded an increase in the number of people receiving treatment (Drug Abuse Information Network for Asia and the Pacific, 2014). Providing effective treatment for ATS users is still a challenge. There are no approved pharmacological interventions available to treat ATS users and only psychosocial interventions are available. Well developed treatment protocols in the region are still in need and while more ATS users are in need of the treatment, the quality of treatment provided cannot be ascertained regionally.

Obtaining good data in the region is still a challenge. Only seizure of ATS data is available, drug arrests and treatment data is not collected systematically and routinely in the region. Only a few countries conduct nationally representative household surveys to understand the trends of ATS use (McKetin et al., 2008). There is also an emerging problem of poly-drug use among ATS users. The number of drug users who are using opioids and other New Psychoactive Substances (NPS) together with ATS is not well understood in the region.

2.3 Malaysian Drug Problem

The data to describe the Malaysia drug problem will be divided into three main sections. First the number of drug users detected and/or detained will be shown, followed by the number of drug dependents who are in treatment, followed by enforcement data on the seizures of drugs as well as the number of suspected drug traffickers detained. It is important to examine these various types of data to gain a better insight to the drug problem in the country. A total of 413,754 registered drug users