POLY-DRUG USE AND VIOLENT CRIME AMONG OFFENDERS IN THE STATE OF PENANG: A CROSS-SECTIONAL STUDY

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by

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UNODC	United Nations Office on Drugs and Crime
SUDs	Substance Use Disorders
OST	Opioid Substitution Treatment
HIV	Human Immunodeficiency Virus
PWIDs	People Who Inject Drugs
PWUDs	People Who Use Drugs
UNAIDS	United Nations Programme on HIV/ AIDS
ATS	Amphetamine-Type Stimulant
CNS	Central Nervous System
MDMA	3,4-Methylene-Dioxymethamphetamine
MDEA	3,4-Methylemeddioxyethylamphetamine
MDPV	Methylenedioxypyrovalerone
CDDCs	Compulsory Drug Detention Centers
QoL	Quality of Life
MMT	Methadone Maintenance Treatment
IDUs	Injecting Drug Users
MSM	Men Having Sex with Men
GPs	General Practitioners
KPIs	Key Performance Indicators
CI	Crime Index
RMP	Royal Malaysia Police
ADHD	Attention Deficit-Hyperactivity Disorder
CNS	Central Nervous System

PFC	Prefrontal Cortex
APA	American Psychiatric Association
CBT	Cognitive Behavioral Therapy
FDA	Food and Drug Administration
PTSD	Post-Traumatic Stress Disorder
NKRA	National Key Results Area
SPSS	Statistical Package for Social Sciences
SPM	Sijil Pelajaran Malaysia
PMR	Penilaian Menengah Rendah
ED	Erectile Dysfunction
NAc	Nucleus Accumbens
NADA	National Anti-Drug Agency
NSEP	Needle-Syringe Exchange Program
MAC	Malaysian Aids Council
FDUs	Female Drug Users
ICP	Intra Corporal Pressure
BP	Blood Pressure
SDS	Substance Dependence Scale
OUD	Opioid Use Disorder
MAT	Medicine-Assisted Treatment
STD	Sexually Transmitted Diseases

LIST OF APPENDICES

PENGGUNAAN PELBAGAI DADAH DAN JENAYAH KEKERASAN DALAM KALANGAN PESALAH DI NEGERI PULAU PINANG: SATU KAJIAN KERATAN RENTAS

ABSTRAK

Penggunaan amphetamine-type stimulant (ATS) dikaitkan dengan pelbagai kesan kesihatan seperti jangkitan HIV, tingkah laku seksual yang berisiko, masalah psikologi dan tingkah laku jenayah. Walaupun hubungan antara penyalahgunaan dadah dan jenayah tidak dikaji secara menyeluruh di Malaysia, dapatan dari perspektif antarabangsa menunjukkan bahawa orang yang menggunakan dadah (PWUDs) lebih cenderung ditahan bagi kesalahan jenayah. Kajian ini menentukan hubungan antara penggunaan ATS poly-drug dan jenayah dalam satu kohort tahanan polis yang ditahan untuk kesalahan jenayah di Negeri Pulau Pinang. Sejumlah 149 tahanan polis dengan sejarah penggunaan dadah haram telah direkrut melalui pensampelan bertujuan dan mudah untuk kajian keratan rentas ini. Tinjauan survei dilakukan melalui temuduga secara bersemuka dengan satu borang soal-selidik separa berstruktur. Majoriti lelaki (93%, n=138/149), dan kebanyakan adalah Melayu (58%). Hampir kesemuanya (97%) menggunakan ATS untuk kesan stimulan/stamina. Keputusan dari analisis Chi-square menunjukkan bahawa pengguna ATS jangka panjang (>6 tahun) mempunyai kebarangkalian yang tinggi untuk melakukan jenayah kekerasan dalam tempoh enam bulan yang lepas (OR: 9.75: 3.27-29.08; p<.0001), telah terlibat dalam serangan fizikal dalam tempoh enam bulan yang lepas (OR: 2.96: 0.98-8.99; p<.049), dan telah menggunakan ATS sebelum melakukan jenayah (OR: 3.04: 1.13-8.16; p<.025), berbanding dengan pengguna ATS jangka pendek (<6 years). Tambahan, pengguna ATS jangka panjang mempunyai kecenderungan untuk mencederakan mangsa jenayah

mereka (OR: 3.6: 1.16-11.19; p<.027). Sementara, pengguna ATS poly-drug jangka panjang mempunyai kebarangkalian yang tinggi untuk terlibat dalam serangan fizikal dalam enam bulan yang lepas (OR: 2.77: 1.01-7.63; p<.046), dan telah menggunakan ATS sebelum melakukan jenayah (OR: 2.85: 1.03 -7.92; p<.042), berbanding dengan pengguna ATS poly-drug jangka pendek. Tanpa menghiraukan petunjuk yang tinggi untuk rawatan, dapatan menunjukkan bahawa PWUDs lebih mudah ditahan untuk kesalahan jenayah kekerasan dan tanpa kekerasan di Negeri Pulau Pinang.

POLY-DRUG USE AND VIOLENT CRIME AMONG OFFENDERS IN THE STATE OF PENANG: A CROSS-SECTIONAL STUDY

ABSTRACT

Amphetamine-type stimulant (ATS) use is associated with a myriad of health problems such as HIV transmission, risky sexual behaviours, psychological problems and criminal behaviours. Though the relationship between illicit drug use and crime is poorly investigated in Malaysia, findings from international perspectives show that people who use drugs (PWUDs) are more likely to be detained for criminal offences. This study determined the relationship between ATS poly-drug use and crime in a cohort of police detainees who were caught for criminal offences in the state of Penang. A total of 149 police detainees with current illicit drug use history were recruited through purposive and convenience sampling for this cross-sectional study. The surveys were conducted through face-to-face interviews with a semi-structured questionnaire. Majority males (93%, n=138/149), and most were Malays (58%). Almost all (97%) used ATS for its stimulant/stamina effects. Results from Chi-square analysis indicate that long-term (>6 years) ATS users had higher odds of having committed a violent crime in the last six-months (OR: 9.75: 3.27-29.08; p<.0001), had engaged in a physical assault in the last six-months (OR: 2.96: 0.98-8.99; p<.049), and had used ATS before committing crime (OR: 3.04: 1.13-8.16; p<.025), compared to short-term (<6 years) ATS users. Furthermore, long-term ATS users had a tendency to harm their crime victims (OR: 3.6: 1.16-11.19; p<.027). While, long-term ATS poly-drug users had a higher risk of engaging in a physical assault in the last six-months (OR: 2.77: 1.01-7.63; p<.046), and had used ATS before committing crime (OR: 2.85: 1.03-7.92; p<.042), than short-term ATS poly-drug users. Regardless of the high

treatment indication, findings indicate that PWUDs are prone to be caught for violent and non-violent crimes in the state of Penang.

CHAPTER 1

INTRODUCTION

1.0 Introduction

This chapter introduces the first chapter of the thesis. The global drug abuse problem and Malaysian substance abuse problem are delineated in this chapter. In addition, the study problem statement, research questions, study objectives, scope of study and study significance have been translucently described in this chapter.

1.1 The Global Drug Abuse Problem

Based on the latest World Drug Report, 2019 by the United Nations Office on Drugs and Crime (UNODC), it is estimated that in 2017 a total of 271 million people worldwide aged between 15-64 years, have used illicit drugs at least once in the previous year (range: 201 million to 341 million) (UNODC, 2019). This correlates to 5.5 percent of the global population aged between 15-64 years, representing one in every 18 people. Though the global estimates for the number of people who use drugs (PWUDs), as well as the global prevalence of people with drug use disorders (SUDs) continue to increased, data in Figure 1 and Figure 2 from UNODC show, the number of PWUDs and prevalence of SUD remained significantly unchangeable from 2006 to 2017 (UNODC, 2019).

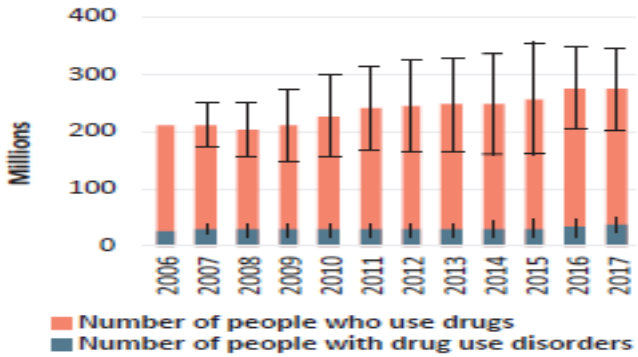

Figure 1.1 Global trends in the estimated number of people who use drugs (PWUDs) and those with drug use disorders (SUDs), 2006-2007 (Source: UNODC, 2019).

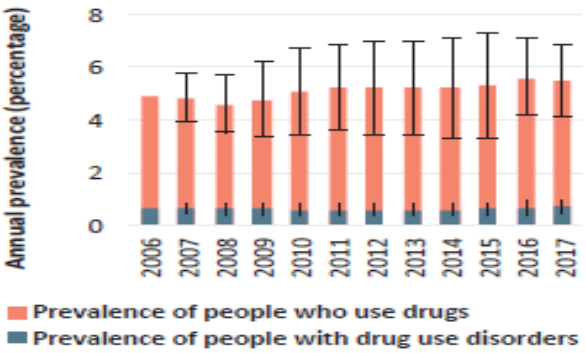

Figure 1.2 Global trends in the estimated prevalence of drug use and drug use disorder, 2006-2017 (Source: UNODC, 2019).

Despite the high estimated prevalence of illicit drug use, UNODC estimated that out of the 271 million people who have used illicit drugs in 2016, roughly 35 million (range: 23 million to 47 million) people are estimated to be afflicted by drug use disorders (SUDs). This indicate that their drug using behaviours or practices were harmful to the point where they may experience drug dependence and/or require treatment for their drug-induced health problems such as mental health problems, HIV and hepatitis C infections, etc., (UNODC, 2019). Apart from the escalating prevalence of illicit drug use, cannabis remains as the most widely used illicit substance globally. UNODC estimated that in 2017, a total of 188 million people had used cannabis, corresponding to 3.8% of the global population aged between 15 to 64 years. The prevalence of cannabis use was reported to be annually high in North America, Oceania and West, and Central Africa (UNODC, 2019). Although opioids remain as a major concern in many countries – chiefly because of its detrimental health issues, UNODC estimated in 2017, out of the 167,000 reported deaths, 110,000 (66%) were contributed by opioid use (UNODC, 2019). Despite the expansion of opioid substitution treatment (OST) program, the opioid abuse scourge continues to be a major problem especially in North America and Canada, because of the emergence of *fentanyl* and its analogues which are commonly used as a potent alternative to morphine (heroine) (UNODC, 2019). UNODC estimated roughly 53.4 million people

have used opioids (opioids for prescription and non-medical purposes) in 2017. Similarly, UNODC also estimated that about 28.9 million people have used amphetamines (especially methamphetamine) in 2017, corresponding to 0.6% of the global population aged between 15-64 years, 15% lower than the previous year (34.2 million). Over and beyond the marked increase in methamphetamine use in North America, the use of crystal methamphetamine has also increased in East and Southeast Asia (UNODC, 2019). The golden triangle along the porous borders of Thailand and Myanmar has become one of the biggest hubs for methamphetamine production in Southeast Asia (UNODC, 2019).

UNODC also found an increasing number of adolescents are involved in substance use/abuse problems. The lack of knowledge regarding the consequences of drug use have been identified as one of the main factors that increases an individual's vulnerability to drug using behaviours. While some of the other vulnerability factors include genetic predisposition, personality traits (e.g. impulsivity, sensation seeking, etc.), the presence of mental health problem and behavioral disorders, family neglect and abuse, poor attachment with school and community, social norms and environments conducive to substance use, and growing up in marginalized and deprived communities (UNODC, 2019). Access to evidence-based treatment programs have always become a problem for treatment-seeking individuals with substance use/abuse problems globally (UNODC, 2019). UNODC found access to treatment programs have become a major issue at the international level – only one out of seven people with drug use disorders (SUDs) receive treatment yearly (UNODC, 2019). Though women tend to progress to drug use disorder more rapidly than their male peers, women may be afraid to seek immediate help for their drug use problems. The reason why women tends to procrastinate treatment can be largely attributed to legal

repercussions, social stigma and discrimination if they are pregnant, the lack of childcare while in treatment, or because of other family responsibilities related to their role as a mother and caregiver (UNODC, 2019). In reality, treatment services are not always made accessible for specific group of people (e.g. female drug users, pregnant women, etc.). Moreover, PWUDs are also susceptible to various health problems ranging from mental health disorders to HIV infections. People who inject drugs (PWIDs) are disproportionately affected by HIV. UNAIDS estimated in 2017, PWIDs are 22 times more likely to be living with HIV than the general population (UNODC, 2019). As part of the UN Sustainable Development Goals (SDGs) initiative, UN have urged governments to take proactive steps in ending HIV – increase treatments access and ensure people living with HIV have suppressed viral load (UNODC, 2019).

1.2 Global Amphetamine-Type Stimulant (ATS) Use Problem

Stimulants, or psychostimulants are a class of drugs that interact with the central nervous system (CNS). Amphetamine-type stimulant (ATS) use is associated with a range of effects such as increase alertness, heighten arousal and behavioural excitement (UNODC, 2019). ATS is reported to increase the activation of natural stimulating pathways in the brain (three monoamine neurotransmitters) – dopamine, norepinephrine and serotonin. In fact, psychostimulants can be divided into several categories: 1) plant-based substances (e.g. cocaine and crack cocaine derived from the coca leaf), ephedrine and pseudoephedrine (ephedra) and cathinone (*khat*), 2) synthetic nature (e.g. amphetamine and methamphetamine; ecstasy group substances such as MDMA (3,4-methylene-dioxymethamphetamine), and MDEA (3,4-methylemeddioxyethyl-amphetamine), and, 3) synthetic cathinone such as mephedrone and MDPV (methyl-enedioxy-pyrovalerone). Although some psychostimulants have been approved for medical applicability, indeed most

psychostimulants are controlled under the International Drug Conventions. Amphetamine and methamphetamine are primarily produced for its stimulant effects. UNODC estimated that approximately 29 million people have used amphetamines and prescription stimulants, while 21 million have used ecstasy in 2017 (UNODC, 2019). UNODC drug report indicates – it was difficult to estimate the quantity of the global ATS production, since clandestine laboratories are located widely in many different isolated regions within Southeast Asia. Between 2013 and 2017, member states, through its enforcement unit managed to destroy roughly 36,600 clandestine laboratories that were built to produce ATS. A majority (96%) of the annihilated laboratories were producing crystal methamphetamine (UNODC, 2019). Global ATS seizure has also increased significantly from 2009 to 2017 – this indicate that ATS popularity is slowly becoming pervasive (UNODC, 2019).

1.3 Malaysia Drug Abuse Problem

Malaysia is also not exonerated from the global drug abuse problem. Historically, located adjacent to the porous borders of the *golden-triangle*, Malaysia have confronted with the opiate abuse menace even before its independence from the British rule. Under the British supremacy in Malaya – migrant workers from Mainland China were hired to work in tine-mines, while Indian nationals from India were employed to work in the agricultural sector. To intensify work productivity, these migrant workers also brought their drug using behaviours along with them to Malaya. Back then, the use of illicit substances, primarily opiates and cannabis were not viewed as a serious problem, since it was imperatively used for its therapeutic and recreational purposes. Due to the high demand for opium, it can be bought unrestrictedly from Chinese Medical Hall (back then, opium sale/distribution was controlled by Chinese elites or businessman). Since opium smoking habit cause people to become

unproductive, opium distribution was eventually regulated in Malaya in 1925. After a number of years, in order to curtail opium misuse among the skilled migrant workers, stringent preventive measures were introduced. The Dangerous Drugs Act 1952 was subsequently enforced in 1952. The law carries inhumane penalties against those who are engaged in opium smoking and trafficking activities. Despite the existence of the retributive law, the opiate abuse prevalence grew significantly to other parts of the country. Heroin prominence escalated during the Vietnam war, when American soldiers who were then visiting Malaysia introduced heroin to locals. The heroin smoking trend turned out to be alarming when locals begin to honour and idealize the *hippie* culture – the western culture is believed to promote deviancy as hippie followers felt that it was not wrong to smoke heroin.

Since illicit drug use/abuse was viewed as a national security and social problem by the government, the Drug Dependants (Treatment and Rehabilitation) Act 1983 was subsequently introduced in 1983. The Act punitively detained and coerced PWUDs into formal treatment institutions (a.k.a. compulsory drug detention centers – CDDCs) in the country. Unfortunately, with the implementation of the rigid drugs laws and policies – the measures did not effectively curb the burgeoning opiate abuse problem in the country. The number of problem drug users continue to rise markedly. More involuntary treatment centers (CDDCs) were gradually built over the years to provide treatment for PWUDs. Until the late 80's, the illicit drug use problem was not seen as a major problem. However, the situation turns out to be despicable when opiate users started injecting opiates due to the low purity of street heroin. After the first HIV case was identified in 1986, immediate measures were undertaken to prevent HIV spread. The HIV problem become a national health concern when an increasing number of opiate injectors begun contracting HIV through receptive and anomalous

needle-sharing behaviours (Vicknasingam and Navaratnam, 2008; Malaysian Aids Council, 2018). To prevent HIV spread, harm-reduction programs (methadone maintenance treatment MMT and the needle syringe exchange program) were instantaneously implemented, though it was severely opposed at the beginning by religious scholars who had ambivalent perceptions towards the harm-reduction intervention (Reid et al., 2007).

After the implementation of harm-reduction interventions, various studies have been conducted to determine its effectiveness. Some of the earlier studies mainly look at the social functioning or quality of life (QoL) of clients in methadone maintenance treatment (MMT) program (Mohamad et al., 2010; Baharom et al., 2012; Devi et al., 2012). Mohamad et al. (2010) found clients who received a daily dose of at least 40mg of methadone were more likely to be retained in treatment, and reported reduced frequency of injecting behaviours. Similarly, Baharom et al. (2012) found opiate users who stayed on methadone treatment programs for a minimum of six-months, have significant short-term improvement in QoL. As the MMT program begin to expand and introduced in prison settings in the country, Wickersham et al. (2012) conducted a study among opiate users in prison, and found prison-based MMT program have been effectively implemented, however adequate dosing and approaches are required to ensure the success of the problem. Moreover, Vijay et al. (2015) conducted a study among out-of-treatment opiate injectors in Kuala Lumpur, and found perception towards methadone treatment was considerably low – factors associated with low treatment readiness include having previous drug rehabilitation history, being an Indian, and had enrolled before in needle-syringe program.

In addition, some researchers embark on various fronts to investigate the prevalence of ATS use specifically in opiate users (Chawarski et al., 2012), HIV risk behaviours among out-of-treatment opiate poly-drug users (Bazazi et al., 2015; Vijay et al., 2015), and the long-term psychological effects of ATS use among methamphetamine users in the country (Sulaiman et al., 2014). Chawarski et al. (2012) found out-of-treatment injecting drug users (IDUs) in Malaysia are engaged in high-risk behaviours regardless of their HIV status. The study found lifetime history of ATS use, and lifetime history of sharing injecting equipment was associated with HIV infections. Parallel to the finding, Lim et al. (2018) found methamphetamine use is becoming more common among men having sex with men (MSM) in Malaysia. The study showed methamphetamine was primarily used by MSM to increase sexual capacity, heighten sexual pleasure, and enhance sexual exploration and adventurism. Since long-term methamphetamine use was associated with psychological problems, Sulaiman and associates (2014) found those with severe methamphetamine dependence have a higher risk of developing psychosis. The study found 47.9% of methamphetamine users had a past history of psychotic symptoms, while 13% had current psychotic symptoms. Last but not least, after almost a decade of MMT implementation, Vicknasingam et al. (2015) investigated Buprenorphine/Naloxone treatment practices among private GPs in the country. Findings from the study show that private GPs must receive additional training in the field of addiction medicine, establish standards for dispensing Buprenorphine/Naloxone optimally, conduct routine drug screens and provide counselling to clients. Researchers opined that forcefully confining people who use drugs over minor drug-abuse offences in compulsory drug detention centers (CDDCs) or in prisons/jails may exposed them to greater health and social issues. In practical terms, prison-based

treatment/rehabilitation intervention has been considered as an inhumane form of rehabilitation. A recent study by Wegman et al. (2017) in Malaysia, found opiate users treated in (CDDCs) have higher possibility of relapsing to opiate use after their post-released, compared to clients treated in voluntary treatment centers (VTCs) – with evidence-based treatment such as methadone.

Hitherto, information pertaining to ATS use still remains limited, though ATS use has surpassed opiate popularity in the country in the last three years (2016-2018) (National Drug Report, 2019). As a result of this research gap, further studies are needed to fill the devoid in ATS research in the country.

1.4 Problem Statement

Based on the available information, previous studies predominantly reported on the opiate abuse problem (Chawarski et al., 2012; Ali et al., 2017), and evaluated MMT treatment outcomes from multiple perspectives in the country (Mohamad et al., 2010; Baharom et al., 2012). In actuality, these studies typically identified HIV risk factors and behaviours among out-of-treatment opiate users, and those who were engaged in aberrant drug injecting behaviours (Chawarski et al., 2012). However, though previous studies have given considerable emphasis in understanding the opiate and ATS abuse problem – studies investigating the interplay between drug use and crime remains poorly investigated in the country. Though researchers in the West have contended that drug use has a link with crime, or people who use drugs (PWUDs) may engage in crime, information on the drug and crime nexus or connectivity is trivially explored and merits further investigation due to the increase in violent and non-violent crime occurrences in the country.

Theoretically, people may engage in drug using behaviours or use psychoactive substances for various reasons, though drug use is reported to stemmed from social, economic and health problems. Scientifically, it is reported that biological factors such as genetic vulnerability (e.g. personality traits) and underlying unresolved mental health disorders could cause people to use or engage in drug using behaviours (Volkow et al., 2003). According to the addiction model framework, various circuits in the brain are involved in drug abuse and addiction; a) *reward* (located in the nucleus accumbens – NAc) and ventral pallidum), b) *motivation/drive* (located in the orbitofrontal cortex (OFC) and the subcallosal cortex), c) *memory and learning* (located in the amygdala and hippocampus), and d) *control* (located in the prefrontal cortex and the anterior cingulate gyrus (CG) (Volkow et al., 2003). These four circuits are interconnected with the brain dopamine system (DA), and have shown that activation of dopamine system increase the reinforcing effects – eventually causing someone to develop dependence on illicit substances (Volkow et al., 2003). It is hypothesized that decreased sensitivity to reward circuits, decreased activity of control circuits, or an increased sensitivity of memory/learning or motivation/drive circuits could insidiously make an individual vulnerable to addiction (Volkow et al., 2003).

Though more than 500,000 drug users have been detected in the country over the years, based on the latest National Drug Report (2019), more than twenty thousand individuals are annually detected (between 2015 to 2018) as new problem drug users (new cases) in the country (See Figure 3). While the number of repeat drug users (repeat cases) remained significantly high from 2015 to 2018 (See Figure 3). This symbolizes that the relapse rate among rehabilitated clients (e.g. those who have been mandated to undergo compulsory treatment in institutional settings) are extremely high in the country. Similarly, opiate using trend is also slowly diminishing, and this

declining trend has been replaced by amphetamine-type stimulants (ATS). Figures obtained from the 2019 National Drug Report, show opiate use prevalence had declined from 13,959 cases in 2014, to 5,773 cases in 2018. While methamphetamine use prevalence, both the used of crystal and tablet methamphetamine has increased from 4,1241 cases in 2014, to 8,698 cases in 2018, and 1,221 cases in 2014, to 3,822 cases in 2018, respectively (See Figure 4).

Notwithstanding the illicit drug use problem in the country, the government is also involved in documenting information on crime prevalence (crime index) in the country. The constant public backlash on crime occurrences have led the government to initiate crime prevention interventions in the country. Specific key performance indicators (KPIs) have been established to monitor crime prevalence (incidence) in the country. Generally, the Crime Index (CI) in Malaysia documents the prevalence of violent and property crimes, as a form of non-violent crime. The country's CI especially for property crime had remained constantly high from 2015 to 2017, though a marked decreased was observed in 2017 (See Figure 7). Compared to property crime occurrences, violent crime occurrences have remained stable, although about more than twenty-thousand cases are reported between 2015 and 2017 in the country. It will add crucial value to the current body of knowledge, if researchers could identify the number of people arrested for index crime – who tested positive for illicit drug use. To date, though studies investigating the intersections between drug use and crime are still limited, there is an urgent need for more novel studies – to help policymakers understand how drug use perpetuates criminal behaviours. In the West, ATS (amphetamine and methamphetamine) use is associated with criminal behaviours (Bennett et al., 2008). Individuals or police detainees with ATS dependence are more likely to engage or be arrested for criminal transgressions (Bennett et al., 2008).

Though the state's (Penang) crime index had decreased from 394.4 in 2015, to 318.3 in 2017 (out 100,000 population), arrests figures for narcotic-related offences are still high (Royal Malaysian Police, 2019).

Since the number of people arrested for ATS use had increased, and findings from the West continue to highlight the correlation between ATS use and crime, on this account, this proposed study aims to determine the criminal behaviours of police detainees who were arrested for crime offences under the influence of ATS in the state of Penang.

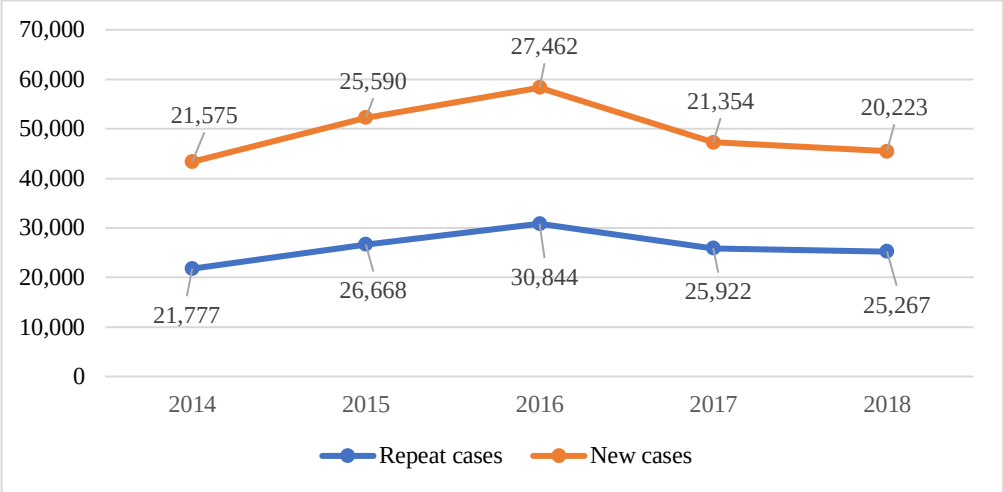

Figure 1.3 Number of repeat and new cases of detected drug users in the country from 2014 to 2018 (Source: National Anti-Drug Agency, 2019).

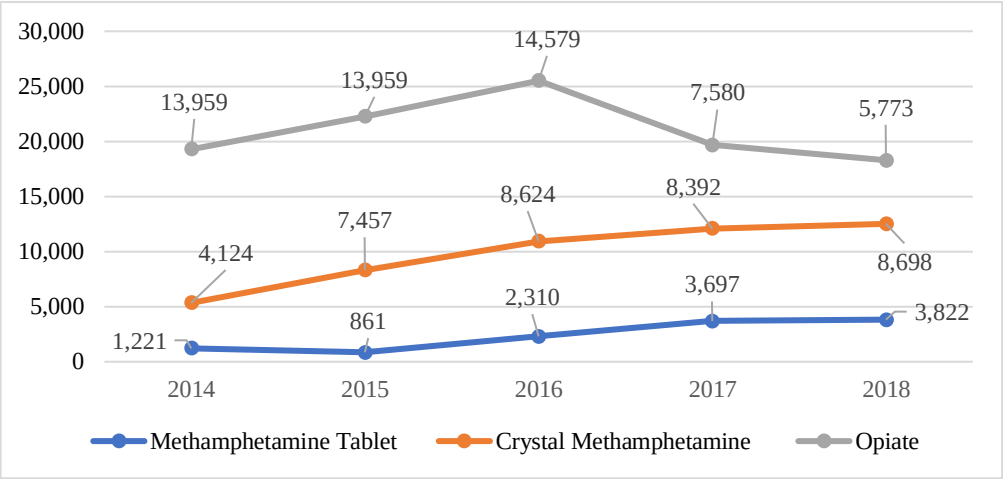

Figure 1.4 Prevalence of Opiate and Methamphetamine (crystal and tablet) use in the country from 2014 to 2018 (Source: National Anti-Drug Agency, 2019).

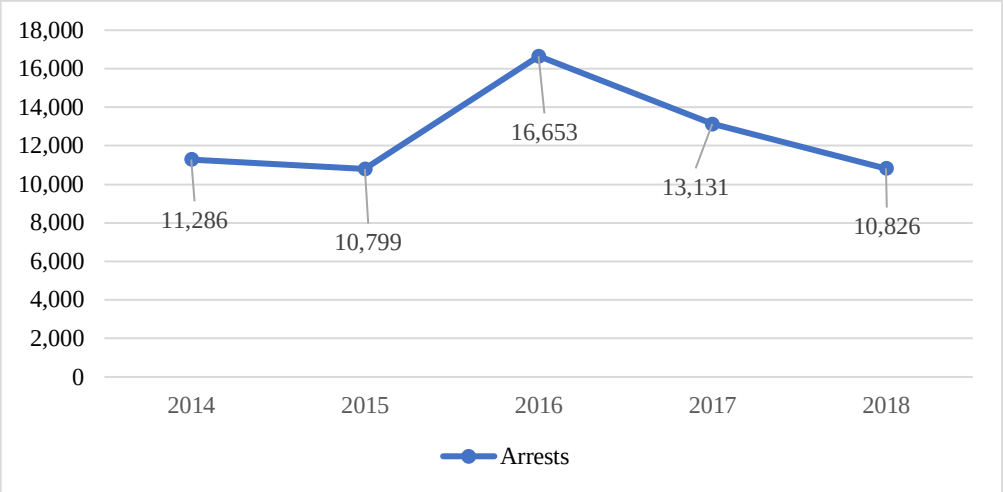

Figure 1.5 Arrests figures from 2014 to 2018 in the State of Penang (Source: Royal Malaysian Police).

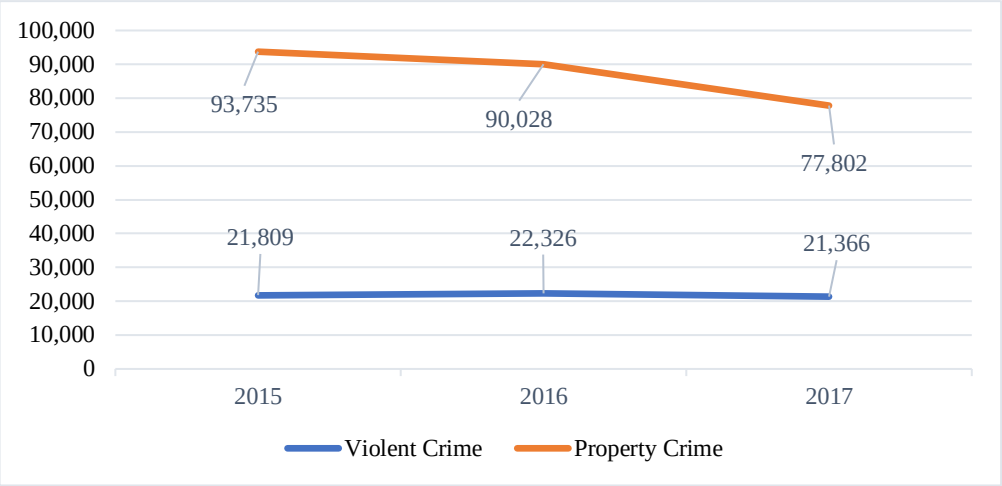

Figure 1.6 Index Crime for Violent and Property Crime in the country from 2015 to 2017 (Source: Royal Malaysian Police, 2019).

1.5 Hypothesis

Amphetamine-type stimulant (ATS) users are more likely to engage in crime, and are susceptible to Police arrestment.

1.6 Research Questions

Five research questions were formulated based on the problem statement and scope of study.

1. What are the behavioural characteristics of Police detainees who reported methamphetamine/ATS use in the state of Penang?

2. What is the criminal profile of Police detainees who reported methamphetamine/ATS use in the state of Penang?

3. Are there any differences in the criminal profile of Police detainees who reported methamphetamine/ATS use, and methamphetamine/ATS poly-drug use in the state of Penang?

4. Do Police detainees with methamphetamine/ATS use history engage in risky sexual behaviours in the state of Penang?

5. Does severe methamphetamine/ATS dependence associated with psychological problems among Police detainees in the state of Penang?

1.7 Study Objectives

Based on the given research questions, five research objectives were developed for this study.

1. To determine the behavioural characteristics of Police detainees who reported methamphetamine/ATS use in the state of Penang.

2. To identify the criminal profile of Police detainees who reported methamphetamine/ATS use in the state of Penang.

3. To investigate the relationship between criminal profile of Police detainees with those who reported methamphetamine/ATS use, and methamphetamine/ATS poly-drug use in the state of Penang.

4. To examine the risky sexual behaviours of Police detainees who reported methamphetamine/ATS use in the state of Penang.

5. To assess the relationship between methamphetamine/ATS dependence severity with psychological problems among Police detainees in the state of Penang.

1.8 Scope of Study and Conceptual Framework

This non-interventional, preliminary cross-sectional study attempts to determine the relationship between methamphetamine/ATS use and crime (criminal behaviours of Police detainees) in the state of Penang Island. Criminal offenders (Police detainees) who were arrested by the Royal Malaysia Police (RMP) for their involvement in crime in the state of Penang were recruited through purposive and convenience sampling for this study. This study aims to investigate the relationship between methamphetamine/ATS use and its association with crime (criminal behaviours), risky sexual behaviours and psychological problems among Police detainees in the state of Penang. Various variables (both *independent* and *dependent* variables, as shown in Figure 8) were used to establish the link between methamphetamine/ATS use and criminal behaviours of Police detainees.

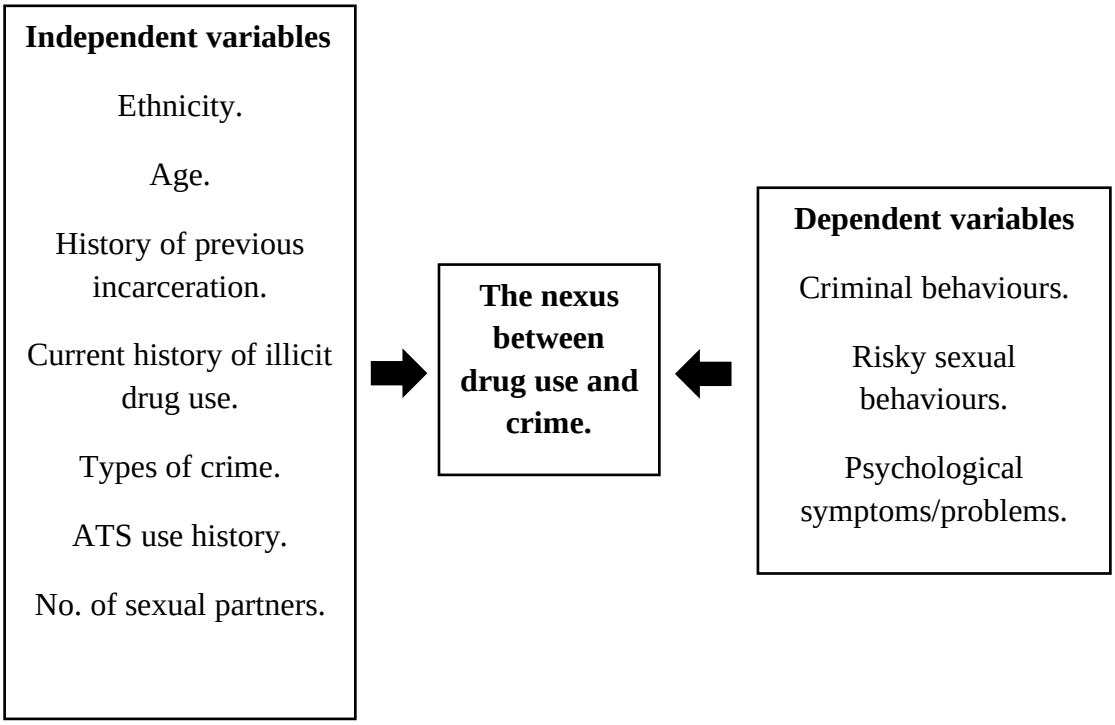

Figure 1.7 Conceptual Framework.

1.9 Study Significance

Literatures delineating the nexus between drug use (particularly methamphetamine/ATS use) and crime is still scarce, disproportionately investigated compared to the opiate and ATS use problems, and deserve to be further investigated in the country. To the best of my knowledge, so far, no studies have investigated the relationship between methamphetamine/ATS use and crime in Malaysia. Hence, findings from this preliminary study can facilitate to provide a more comprehensive scientific understanding specifically on the link between methamphetamine/ATS use and crime, as well as generally describe the demographic characteristics of criminal offenders (Police detainees), their risky HIV sexual behaviours, prevalence of psychological symptoms, and the criminal behaviours of criminal detainees who reported only methamphetamine/ATS use, and methamphetamine/ATS poly-drug use. For instance, Royal Malaysia Police (RMP) can utilize this study findings to make

informed policy-decisions on crime prevention programs, and interventions in the country. Since methamphetamine/ATS users are predisposed to HIV risk behaviours, findings from this study can also be used by health providers to develop interventions to increase detainee's knowledge on HIV risk behaviours. In essence, policymakers can also use this study findings to lobby policymakers to provide better healthcare services to detainees during their detention in Police lockup. This is because, there have been an increased in the number of custodial deaths involving detainees particularly among drug users. Providing immediate treatment during the time of detention can reverse custodial mortality in Police detainees. Nevertheless, findings from this study can provide more insights about mental health problems among detainees – Police can in fact, help divert non-violent criminal offenders to psychiatric clinics for treatment. Detainees with untreated psychological problems may have a tendency to harm themselves, and others. Essentially, criminal detainees arrested with underlying mental health problems may stand a chance to get acquitted for their criminal offences because of their unsound mental state. Indeed, this situation can also endanger the well-being of raiding officers and undermine Police investigation. To combat crime more effectively among those with drug use problems, Royal Malaysian Police can use this study findings as a guideline to design appropriate crime prevention measures in the country. Since the focus of the study was to understand the relationship between methamphetamine/ATS use and crime, prospective studies can also use this study findings as a baseline to develop and expand their research scope. Last but not least, crime researchers can also use this study findings to better understand the drug use and crime connectivity in the country.

1.10 Conclusion

The next chapter is the literature review chapter. The pharmacological effects of ATS (methamphetamine) use, its short and long-term effects, crime and drug use theories, methamphetamine use associated psychological problems, drug dependence definition, and sexual risk behaviours of methamphetamine/ATS users are comprehensively elucidated in the following chapter.

CHAPTER 2
LITERATURE REVIEW

2.0 Introduction

This is the literature review chapter. All the relevant articles related to the scope of study is enumerated comprehensively in this chapter.

2.1 Amphetamine-Type Stimulant (ATS) Use

Amphetamine-type stimulant (ATS) (e.g. amphetamine/methamphetamine) was previously recognized as an important group of medicines (drugs) with vast therapeutic applications. ATS was first produced in 1887, however it was officially marketed in 1932 for its medicinal value (e.g. relieve nasal congestion). ATS demand increased during Second World War, went it was used as a stimulant drug. To prevent its widespread abuse, stringent measures have been implemented at national, as well as international levels to control its abuse (UNODC, 1996). In the last few decades, ATS popularity increased significantly, unfortunately its use is reported to be associated with various health problems such as HIV transmissions and mental health problems (UNODC, 2019). ATS is a synthetic drug which include amphetamine, methamphetamine, 4-methylenedioxyamphetamine (MDA), and 3,4-methylenedioxymethamphetamine (MDMA). However, methcathinone, fenethylline, ephedrine, pseudoephedrine and methylphenidate are often used as precursors for ATS production (UNODC, 2019). Although ATS appears in various forms (e.g. tablets, liquid, oil base and crystal), meth/amphetamine are widely used for its stimulant and mood enhancing effects (Degenhardt et al., 2010). Amphetamine is a molecule with a single chiral centre which used to reduce stress and improve concentration, as well as intellectual performance by academics, students and medical professionals. It is proven to be clinically effective in treating children suffering from attention deficit-

hyperactivity disorder (ADHD) (Heal et al., 2013). While, MDMA (ecstasy) is an analogue of amphetamine, and is known for its reputation as a safe drug which has been abused for recreational purposes. It also exhibits similar properties as amphetamine and hallucinogenic drugs. However, sweating, tachycardia, fatigue, muscle spasms and jaw-clenching are among some of the common short-term side-effects of MDMA use (Schwartz and Miller, 1997). MDMA is ingested almost exclusively in the form of a pill or tablet (UNODC, 2019). Meanwhile, methamphetamine is the most widely used drug worldwide after cannabis, where it is commonly used for its stimulant, weight reducing, euphoric, and hallucinogenic effects (Krolikowski and Koyfman, 2014). It exists as a white, odourless, bitter-tasting crystalline powder that dissolves easily in water. Methamphetamine can be administered through ingestion, smoking, snorting, sniffing and injection (UNODC, 2019). It is usually available in the form of a pill in Laos and Thailand. While in Indonesia, Malaysia, Brunei, Cambodia, Japan, Korea and the Philippines, methamphetamine usually appears in the form of a crystal. UNODC identified crystal methamphetamine and crushed methamphetamine in the form of pills are widely abused in Thailand, Indonesia and Malaysia (Dargan and Wood, 2012). Malaysia has become a prominent methamphetamine manufacturing location since 2009, and Kuala Lumpur and Southern Malaysia has been identified as the main states for methamphetamine production in the country. Recently crystalline methamphetamine is ranked as the first choice of drug widely used in Malaysia (National Drug Report, 2019).

2.2 Pharmacological Effects of Methamphetamine

2.2.1 Chemistry

"Amphetamine" is a contraction of 'α-methylphenethylamine', an older description of the prototypical compound of which methamphetamine (methylamphetamine, methamphetamine, *N*-methyl-1-phenylpropan-2-amine) is the N-methyl derivative, and is a more biologically active optical isomer (Sulzer D., 2005). *S*-methamphetamine hydrochloride presents as white or translucent crystals, is also known as *"ice"* or *"crystal meth"* (K.Ice, 1990). Crystalline methamphetamine typically has a purity of 80%, and in fact, the purity may be significantly lower due to the presence of cutting agent dimethyl sulphone (Qi Y., 2006). While in the form of powder, methamphetamine purity is reported to be about 10%, and the purity of base (damp oily form) is reported to be about 20% (Cruickshank and Dyer, 2009). Methamphetamine that appears in the form of crystalline is found to be suitable for inhalation because it has a high purity S-methamphetamine hydrochloride that vaporizes without pyrolysis (Cruickshank and Dyer, 2009). It is reported that the use of crystalline methamphetamine is associated with severe addiction potential and dependence (Cruickshank and Dyer, 2009; McKetin et al., 2006).

2.2.2 Molecular Pharmacology

Methamphetamine is found to be an agonist at several receptors (e.g. dopamine, noradrenaline and serotonin receptors). As a result of its chemical 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) (Cruickshank and Dyer, 2009). VMART-2 is embedded in vesicular membranes, while active DAT, NET and SERT are cell surface integral membrane proteins (Sulzer

D., 2005). It is also reported that methamphetamine redistributes monoamines from vesicle storage into the cytosol by reversing the function of VMART-2, and disrupting the pH gradient that otherwise drives accumulation of monoamine in vesicles. While the endogenous function of DAT, NET and SERT is reversed, and often results in the release of dopamine, noradrenaline and serotonin from the cytosol into synapses (Cruickshank and Dyer, 2009). Synaptic monoamines are then available to stimulate postsynaptic monoamine receptors. Methamphetamine is reported to inhibit monoamine metabolism by inhibiting monoamine oxidase (Sulzer D., 2005)

Moreover, *In vitro* studies have demonstrated that methamphetamine is potent at releasing noradrenaline as dopamine, and its effect is 60-times stronger on noradrenaline than serotonin release (Rothman R.B., 2001). Methamphetamine is also shown to elicit an action on the central nervous system (CNS) (dopaminergic circuits particularly mesolimbic, mesocortical circuit and the nigrostriatal pathways). Noradrenergic regions specifically medial basal forebrain, mediates arousal; the hippocampus, involved in memory consolidation; and the prefrontal cortex (PFC), is involved in processing cognitive functions. Serotonin neurons are distributed widely throughout the brain, and regulate diverse functions including reward, hyperthermia, respiration, pain perception, sexual behavior, satiety, impulsiveness, anxiety and higher cognitive functions (Cruickshank and Dyer, 2009).

2.2.3 Methamphetamine Effects

Methamphetamine effects are dose-dependent. At moderate doses (5-30mg) methamphetamine effects include arousal, reduced fatigue, euphoria, positive mood, increasing heart rate, elevated blood pressure, pupil dilation, increased temperature, reduced appetite, behavioural disinhibition and short-term improvement in cognitive functioning (sustained attention) (Cruickshank and Dyer, 2009). While higher doses

of methamphetamine use are associated with cardiovascular problems, followed by severe psychotic symptoms (Cruickshank and Dyer, 2009). Adverse health symptoms such as confused speech, agitation, paranoia, rapid pulse, sweating, nervousness, and motor restlessness were also noted among highly intoxicated methamphetamine users (Cruickshank and Dyer, 2009). In the United States, methamphetamine use was associated with emergency room admissions (Rockville, 2007). Based on case reports, the common features of methamphetamine overdose include agitation, dilated pupils, tachycardia, hypertension and rapid respiration. Findings from case reports show that methamphetamine use is associated with various fatalities, most commonly occurring from multiple congestion, pulmonary edema, pulmonary congestion, cerebrovascular hemorrhage (attributed to hypertension), ventricular fibrillation, acute cardiac failure or hyperpyrexia. However, other fatalities have stemmed from septic injection or asphyxia by aspiration of vomitus (Kalant H., 1975). While other studies indicate that a greater proportion of methamphetamine-related fatalities occurred from road accidents, suicide and homicides, suggesting severe psychological and behavioral disturbances (Gray S.D., 2007). Long-term methamphetamine clinical effects include dry mouth (carry the risk of dental caries), and activation of mandibular muscles, which may lead to bruxism (tooth fracture) (Cruickshank and Dyer, 2009).

2.2.4 Psychosis

Regular methamphetamine use is also shown the be associated with profound incidence of mental health problems. Hallucinations, delusions and odd speech are the most common signs of methamphetamine psychosis. Methamphetamine induced hallucinations, predominantly auditory (reported in 85% of methamphetamine psychotic cases), visual (46%) and tactile (21%). Delusions of persecution (71%), reference (63%) and “mind-reading” (40%) are also common (Cruikshank and Dyer,

2009). There are considerable differences in both the dose required (55-640 mg), and the onset of psychotic symptoms (7minutes-34 hours post-dose). The duration of psychotic symptoms may vary, disappearing after a week of abstinence in some individuals, and persisting for longer duration in other individuals (Cruikshank and Dyer, 2009). In a previous study (among a cohort of Japanese methamphetamine users), it is shown that methamphetamine users are prone to psychosis; 59% recovered from psychosis within 30 days, but psychotic symptoms can persist for months (after six months) in individuals who have abstained from methamphetamine use (Ujike H., 2004). The suggest that psychotic symptom may resolve spontaneously after abstinence, and methamphetamine users may not require long-term antipsychotic treatment (Cruikshank and Dyer, 2009). It is reported that psychotic symptoms may become significant during episodes of heavy methamphetamine use. Due to the positive symptoms that correlate inversely with DAT density in the striatum and PFC, the sensitization to methamphetamine psychosis may be related to neurotoxicity (Sekine Y., 2003). Non-specific environmental stressors such as incarceration, severe insomnia and heavy alcohol consumption may induce psychotic symptoms during periods of methamphetamine cessation (Cruikshank and Dyer, 2009). Stress-induced psychosis among former methamphetamine users appears to be associated with increased noradrenergic and dopaminergic sensitivity. Methamphetamine-associated neurotoxicity in the striatum correlates with psychotic symptoms, memory deficits and impaired psychomotor coordination. However, the mechanisms of neurotoxicity are not clearly understood. The selectivity of damage may be explained by the oxidation of cytosolic dopamine and serotonin to 6-hydroxydopamine and 5,6-hydroxydopamine, which can oxidize proteins and lipids in dopamine and serotonin-rich neurons.