博士論文

Initiation of methamphetamine use and high-risk sexual behaviors of methamphetamine users in Northern Shan State, Myanmar

（ミャンマー連邦北シャン州におけるメタンフェタミン覚醒剤の使用開始年齢と使用者のハイリスク性行動）

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Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
AOR	Adjusted Odds Ratio
ATS	Amphetamine-type Stimulants
BSS	Behavioral Surveillance Surveys
CASI	Computer-assisted Self Interview
CCDAC	Central Committee for Drug Abuse Control
CI	Confidence Interval
FSW	Female Sex Worker
GEE	Generalized Estimating Equation
HIV	Human Immunodeficiency Virus
IDU	Injecting Drug User
MA	Methamphetamine
MSM	Men Who Have Sex With Men
NIDU	Non-injecting Drug User
OR	Odds Ratio
RDS	Respondent-driven Sampling
SD	Standard Deviation
SPSS	Statistical Package for the Social Sciences
STI	Sexually Transmitted Infection
UNODC	United Nations Office on Drugs and Crime
USD	United States Dollar

Abstract

Background

Globally, methamphetamine (MA) use is a significant public health concern due to unprecedented health effects of its use. However, correlation effects of the early initiation of MA use and high-risk sexual behaviors remain understudied especially in developing countries. Therefore, this study examined factors associated with the early initiation of MA use and the high-risk sexual behaviors among MA users in Muse, Myanmar.

Methods

This cross-sectional study was conducted from January to March 2013 in Muse, Northern Shan State, Myanmar. Self-reported MA users (775 males and 587 females) were recruited using a respondent-driven sampling method. Multiple logistic regressions, and generalized estimating equations models were performed to examine the factors associated with early initiation of MA use and high-risk sexual behaviors stratified by gender.

Results

More than half of males (73.0%) and females (60.5%) initiated MA use before their 18th birthday. MA users were more likely to have first started using it at entertainment venues. Their reasons for first MA use were to lose body weight or work related purposes. Both male and female users who were employed and who had used MA before and during sex were more likely to engage in high-risk sexual behaviors.

Conclusions

More than 60% of MA users started MA use before the age of 18 years. MA users were more likely to be involved in high-risk sexual behaviors. Entertainment venues were the most popular choice of place among MA early initiators. Comprehensive and targeted MA prevention programs should address high-risk sexual behaviors and consider entertainment venues as priority setting. Such programs also need to give attention to vulnerable populations such as migrants, clients of sex workers, and those who exchange sex for money and/or drugs.

Keywords: *Drug users, Methamphetamine, Initiation, Sexual behaviors, Myanmar*

1. Introduction

1.1 Methamphetamine: physical form, types, and mode of use

Methamphetamine (MA) is a psychostimulant of the phenethylamine and amphetamine class of psychoactive drugs [1, 2]. It is an addictive substance, which usually exists in two forms: d-methamphetamine and l-methamphetamine [3]. The type of MA known for its psychoactive properties is d-methamphetamine, but the racemic form, which is a combination of both types, is used more frequently [4].

MA can be produced using chemicals that are easily found in the household [2], unlike most of other psychoactive stimulants such as cannabis and cocaine. Instructions to make MA and its recipes are available even on the Internet and in publications [5]. The process of reducing ephedrine or pseudoephedrine is easy and straightforward, which allows a growing number of 'households' to have their own MA labs [6]. In this way MA is easily available and the number of users are increasing [7].

MA is an organic molecule. Its base form is an insoluble colorless volatile oil. The common salts derived from it are hydrochloride or sulfate, both soluble in water, which look like off-white powder or crystals [3]. MA is available in many different forms including crystalline, irregular chunks of powder, or tablets in different colors [3]. It has different names depending on the region. For example, in Asia, it is known as “Yama/Yaba (crazy drug or horse medicine)” or “Shabu/Syabu”, whereas in the West it is commonly known as “meth, crank, chalk, go, or speed” [8-10].

MA is popular, and used among millions of people worldwide because of its stimulant effects [11]. It acts on the central nervous system by increasing alertness, and providing a sense of increased energy, concentration, physical strength, and euphoria

[12-14]. Because of these effects, MA is often taken at parties or nightclubs in order to remain alert for the whole night, so it is considered a “recreational drug” or “clubbing drug” [15, 16]. MA’s effects generally last for about 8 hours, but can sometimes last up to 24 hours [15].The main routes of administration of MA are through inhalation and snorting. Other less common modes of administration include injecting, smoking, or drinking [17-19].

1.2 Methamphetamine: the global context

1.2.1 Historical background

MA has a long history since its discovery. In 1887, a Romanian chemist Lazar Edeleanu became the first scientist to discover amphetamine. This compound was not used for clinical purpose until the 1920 when a British chemist, Gordon A. Alles re-synthesized the compound into a drug to treat patients with asthma and common colds. From 1930, amphetamine started to be prescribed for various medical conditions including narcolepsy, asthma, obesity, epilepsy, and hyperactivity in children. Furthermore, since 5000 years ago, the Chinese have been using herb which contains ephedra (ma huang) to treat the common cold and asthma [20].

MA is one of the amphetamine group substances and was discovered by a Japanese chemist, Nagayoshi Nagai in 1893. Nagai synthesized MA from ephedrine. MA was not commonly used until 1940s during World War II. During this period, the Japanese, British, German, and American governments gave MA to their military personnel to help them stay awake, stave off battle fatigue, and enhance alertness [21-23]. After World War II, an epidemic use of MA occurred in Japan. It was because

military MA supplies became vastly available in the general population resulting in MA abuse and dependency in Asia and the rest of the world [24].

1.2.2 Global epidemic of methamphetamine use

The amphetamine-type of stimulants (ATS) is the second most common group of illicit drugs globally. It is estimated that up to 80 million people use ATS [25]. MA is the most common illicit drug in the ATS group of drugs. According to the United Nations Office on Drugs and Crime (UNODC), ATS seizures have sharply increased by more than twofold within the past two years indicating an increase in its supply and use [25].

Sixty-nine United Nations member states report an increase in MA use (as opposed to stable levels) based on the expert perceptions of MA use. Among the member countries, a majority of them is in Asia. They perceived an increased use of MA in their own county [26]. The UNODC report showed that MA use in developing countries is significantly higher compared to that in the developed countries. Moreover, MA use among people in the middle class living in the emerging economies has been increasing for a couple of decades [26]. East and Southeast Asian regions have had a significant increase in the seizure and use of ATS. It is in these regions where about a third of the global population lives in. Data for East and Southeast Asia suggest that between 4.4 and 37.9 million people have used MA in 2010 [25]. The recent UNODC report presented data on seizures of MA pills in which there was an increase of more than seven times within 5 years (2008 to 2012) in the East and Southeast Asian region [27].

In the past, MA use was believed to be mostly a male phenomenon. In the 1980s, female substance use was viewed as being dependent upon their relationships

with men. Females were either viewed as “good” citizens with an addiction problem, or “bad” ones whose drug use mirrored their roles as deviants [28]. However, a high proportion of female users are emerging to the level that is equivalent to or more than that of men in many countries [29]. Since the 1980s, there is an increase in the proportions of females who use drugs even outside of relationships with male [30]. Researchers are thus now exploring gender differences among male and female MA users in greater details [30].

Gender specific variations have been reported for many aspects of MA use, dependence, and treatment. For example, compared to male MA users, female MA users tend to show more dependence and commitment to using MA, while males tend to use other drugs if MA is not available [31, 32]. Furthermore, females access MA addiction treatment more often than males [33], and they are friendly and responsive to being treated for MA abuse [34]. Males are also less likely to initiate MA, cocaine, and amphetamine at earlier ages [32, 35], and also report drug abuse related medical problems less often than females [36].

1.3 Health effects of methamphetamine use

MA use can result in various adverse health outcomes [37, 38]. It is a highly addictive drug and its regular use (i.e. on a daily basis) or even irregular use (i.e. weekly or two to three times per month) can lead to drug dependency [39, 40]. Dependence on MA can in turn lead to various mental health problems such as anxiety, paranoia, depression, delusions, aggression, hallucinations, and homicidal/suicidal behaviors [41, 42]. In Austria, one out of every two MA users suffer from clinically significant

symptoms of hallucinations [43], and the prevalence of psychotic disorder was 11 times higher compared to the general population [44].

Dependence on MA and its abuse are also associated with physical health conditions, violence, and criminal behavior [45-47]. Some of the physical health conditions associated with MA use include high blood pressure, tachycardia, weight loss, insomnia, and muscular tremors [48]. The chronic conditions that may arise as a result of MA use include cardiac rhythm abnormalities, cerebral hemorrhage, and myocardial infarction [45, 49-51]. MA users also have a higher chance of acquiring sexually transmitted infections (STIs) [12, 52, 53], compared to MA non-users. They are also at risk of developing dental decay and caries [54, 55].

With regard to violent behavior, MA users are more likely to engage in violence and criminal activities while under the influence of the drug [45, 56]. For example, 30% of males and 23% of females from Los Angeles engaged in violent behaviors after using MA [57]. Such behaviors included drug related violence, gang related violence, domestic violence, road rage, and stranger assault [57].

MA use has been associated with high-risk sexual behaviors [58-60], which increase one's risk of contracting STIs including human immunodeficiency virus (HIV)[61-64]. This is because MA acts on its active sites in the central nervous system and can cause loss of inhibitory control of sexually compulsive behavior among its users. Thus, it increases their engagement in risky sexual behaviors [61, 65]. For instance, compared to non-MA users, MA users visit sex workers more often, had more sexual partners, and used condoms less often [18]. Other risky sexual behaviors reported among MA users include exchanging sex for money and/or drugs, engaging in unprotected vaginal and/or anal sex and having sex with new partners [18, 66-69].

Moreover, evidence also suggested that the use of MA has been associated with STI including HIV among treated MA users [70], and unprotected anal sex among men who have sex with men (MSM) and those MSM are more likely to exchange sex money or/and drugs [71, 72]. A number of possible causal mechanisms could underlie the positive correlation between MA use and high-risk sexual behaviors that assessed one's behavior of unprotected sex, had multiple sex partners and diagnosed with an STI [73]. First, some effects of MA may directly complement HIV risk-taking behaviors. MA creates a sense of euphoria, pleasure, and sexual arousal while lowering inhibitions and clouding judgment. MA's effects on judgment may lead into condom non-use even in a high-risk sexual activity [74, 75]. In this case, MA users participate in high-risk sexual behaviors more often when using MA. Second, other effects of MA may indirectly increase the likelihood of STI infection. While MA causes sexual arousal, it also impedes the ability to have an erection [76, 77]. Thus, MSM who take MA may be more likely to engage in receptive anal sex [78, 79]. Such type of sexual intercourse is more risky, thus MA users are more likely to be at risk of an STI transmission [76]. Third, MA addicts, especially females, may resort to exchanging sex for money and/or drug [80]. The positive correlation observed between MA use and high-risk sexual behaviors and STI transmissions may be due to the fourth factor, a preference for high-risk behaviors [81].

1.4 Methamphetamine use in the Myanmar context

In the past couple of decades, Myanmar has been known as one of the key production countries for illicit drugs including MA in the Southeast Asian region [11, 27]. During this time, one billion MA pills that were manufactured in Myanmar have been used in

the Greater Mekong Sub-region (Cambodia, China, Lao PDR, Myanmar, Thailand and Vietnam), and particularly in China and Thailand. Crystalline MA have also been mass-produced in Myanmar to supply markets in the Greater Mekong Sub region, although the use of crystalline MA has not been widely reported [11].

The opiate drugs (heroin and opium) are preferred as the main drugs of choice in Myanmar than MA [82, 83]. However, recent data for Myanmar indicates that the use of heroin and opium has declined while the use of MA pills has continued to increase. Despite such increase of MA use, the number of MA users who seek for drug dependence treatment has remained as low as 4% or less of all self reported MA users in 2010 [11].

Only a handful of research on MA use has been conducted in Myanmar[11]. Challenges in conducting research among MA use in Myanmar include the difficulties in reaching the drug users and their reluctance to disclose their drug use status due to fears of associated stigma and discrimination [84]. In 2011, the Central Committee for Drug Abuse Control (CCDAC) in Myanmar conducted a study among 698 MA users who accessed drug dependence treatment services [11]. The results found that most of the users were aged between 25-34 years, with 42% using MA regularly and the remaining 58% using MA sometimes or occasionally. The majority of the users (69%) engaged in poly-drug use (used more than two different types of drug) and most of the remaining users (30%) reported they only used MA. The most common route of administration was inhaling/smoking, accounting for 96.8%. A low proportion of MA users (0.6%), take MA though the injection route [11].

The magnitudes and trends of MA use and supply can be estimated through the numbers of arrests made, although such method is not robust. In Myanmar, among all

drug-related arrests, MA pills have accounted for about 29% during the past half a decade [11]. The figures for MA seizure and arrests have been increasing, year after year. For example, approximately, 5.9 million MA pills were seized in 2011, which was nearly three times higher than the numbers of seizures for the previous year [11]. The 2011 figures were also the second highest total reported during the past decade. Seizures of MA pills in 16 out of 17 administrative regions in Myanmar in 2009 highlights their nationwide availability [82]. The pill form of MA is known as "Yama/Yaba" or " Kywethi" in Myanmar, and it is extensively manufactured, smuggled and used in Southeast Asia [12, 81].

1.5 The early initiation of methamphetamine use

1.5.1 Age of methamphetamine initiation and the associated factors

The initiation of MA occurs sometime during adolescence. Initiation at such a young age is often associated with a variety of negative outcomes in adulthood including drug addiction, criminal and violent behavior, and health related problems [85, 86]. In addition, individuals who start using drug in their adolescence may continue using it through their adulthood. Even when they stop, they might revert into using it later in adulthood [87, 88]. Thus delaying the initiation of MA use, in addition to preventing MA use, could be important in controlling adverse effects of MA use.

However, the literature on factors associated with early initiation of MA use is limited. Age of MA initiation was reported to vary between genders. In rural areas of Kentucky, the US, males were reported to initiate MA earlier than females (24.9 vs. 26.3 years, respectively) [89]. However, in another study in an urban setting in Los

Angeles, the US, the age of MA initiation among youth was older (19.3 years) for males than that (18.5 years) for females [47]. In Taiwan, a previous study of a sample collected from the juvenile abstinence centers reported similar age of MA initiation of males and females (15.6 vs. 15.4, respectively) [90] while a detention center in Taipei reported earlier initiation of MA among males than females (22.7 vs. 20.3, respectively) [91].

Only two previous studies qualitatively addressed other factors associated with early initiation of MA use, both of which were conducted in Los Angeles, the US. One of these studies reported that the early initiation of MA use was associated with ethnicity (being African American), and criminal behaviors [92]. The other study reported that friends, partners, and spouses are responsible for the early initiation of MA use [47]. No qualitative or epidemiologic study was available in Asian regions. On the other hand, there are several qualitative studies on this topic. A qualitative study conducted in New Zealand [93] explored that majority of MA users are introduced to MA by friends or partners through social activities. Another qualitative study from New York revealed that gay and bi-sexual men had initiated MA for the social purpose [94]. In Asia, the only qualitative study that was conducted in Thailand reported that young males and females had initiated MA due to its availability and influence from their peers [95].

1.5.2 The early initiation of methamphetamine as a predictor of high-risk sexual behaviors

The early initiation of substance use in general has also been associated with high-risk sexual behaviors [96]. For instance, the early initiation of alcohol leads individual to

involvement in high-risk sexual behaviors such as having multiple sex partners and inconsistent condom use [96, 97]. Several studies have also been reported that early initiation of drugs use may increase the risk of HIV transmission [98-100]. Furthermore, the early involvement with drugs also favored engagement in sex work and drugs dealing [101]. However, to date no epidemiological research has examined the association between high-risk sexual behaviors and the early initiation of MA use among MA users.

Notably, the association between MA use and high-risk sexual behaviors is well documented among both males and females whereas the information on early initiation of MA use and high-risk sexual behaviors information is a very limited. For example, 74% of male MA users and 67% of female MA users reported to have enhanced sexual pleasure by using MA [61] in a study conducted in the US. Furthermore, 53% and 56% of male and female MA users respectively, reported that they are more likely to practice risky sex while on MA [61]. Compared to non-MA users, heterosexual female users, MSM users, and heterosexual male users were 6.7, 3.4 and 2.4 times more likely to exchange sex for money and/or drugs, respectively [66]. However, female MA users may be more susceptible to STIs and HIV infection compared to their male counterparts [102, 103]. This association is because female drug users are known to have a higher frequency of injecting drug use [67, 104] and to have a higher biological susceptibility to STIs and HIV through sexual intercourse than their male counterparts [102, 105]. Females have also been reported to have a higher number of lifetime sexual partners [68, 106], compared to their male counterparts. In addition, female drug users also have a higher frequency of overlapping sexual and drug networks [107, 108]. Moreover, female MA drug users

have elevated concomitant sexual risks, including unsafe vaginal and/or anal sex and exchanging sex for money and/or drugs [109, 110]. Thus it is also possible that early initiation of MA use is associated with high-risk sexual behaviors differently between males and females; a factor which is still not well investigated.

1.6 Rationale of the study

1.6.1 The early initiation of methamphetamine use and associated factors in Myanmar

As I noted earlier, there is only limited evidence for factors associated with early initiation of MA use. In addition, most studies [47, 89-91] have limitations such as being conducted in special populations such as users of a drug treatment center or gay and bi-sexual men, and have been conducted in the US [76, 92] or based on only qualitative analysis [93-95]. These studies did not investigate a wide range of factors such as place of MA first use, source of first time MA access, and route of administration of first time MA use. I will focus on two possibly important factors to be investigated further as a determinant of early initiation of MA use.

First, there is a possibility that the reasons of MA use can also affect the early initiation. Many people started to initiate drugs early because of curiosity or for fun or to lose the weight [111]. During the adolescent period girls strongly value themselves as being thin [112]. Therefore, there is a possibility that the reasons of the early initiation of MA use are to lose the body weight or to manage body weight among adolescents [111]. Additional reported reasons that might be responsible for early MA initiation included replacement of another drug, more energy and daytime alertness,

recreational purposes such as sexual pleasures, coping with mood, getting high and escaping, [47, 113, 114]. Thus age of initiation of MA use may depend on reasons to use MA.

Second, using an entertainment venue may affect the early initiation of MA. MA is also commonly known as a "club drug," taken while partying in nightclubs or at rave parties [115]. It is possible that, young drug users find these places as the safest place and easy to access for MA and other illicit drugs, which may also responsible for early initiation of MA. Previous research shows that, some users purchase and use drug in the entertainment venue such as clubs, disco, restaurants, bars, karaoke, and massage parlor to avoid police detection [116]. The use of MA is related to nightclub and nightlife related activity in Hong Kong and some part of mainland China [116]. MA users may perceive that accessing and using MA at entertainment venues are less problematic. Therefore, it is possible that an entertainment venue may play a major role for early initiation of MA.

The age of initiation of MA use and its associated factors have been understudied in Asia. In Myanmar, even the age of MA initiation has not been studied. A study is necessary in Myanmar where MA use is recently a growing concern mainly among the youth population, which represent approximately 25% (aged between15-24 years) of the total population in Myanmar [117]. It is important to know the age of initiation of MA and the associated factors in Myanmar, which could be useful information to establish a strategy to control MA use in this country. Furthermore, some factors may be particularly relevant in the current Myanmar context. For instance, entertainment venues have become popular in many areas of Myanmar, such as dance

club and karaoke, particularly for younger generations, which may increase the risk of early use of MA in Myanmar. It is also interesting to see if factors already reported to be associated with early initiation of MA use in the US, such as gender [47, 89-91] and ethnicity [92], are also associated with it in Myanmar.

As gender-specific patterns of MA use has been reported [31, 32, 35], a gender difference in these factors associated with early initiation of MA use should be investigated, as no previous study addressed this issue. Gender specific consideration of MA initiation is also important in Myanmar. Although no available statistics are found for female MA drug users, it is believed that drug use is also common among females in Myanmar [25]. In a restricted society like Myanmar, female users are more likely to be stigmatized by society than male users [25, 118]. This results in females to conceal their drug use behavior. Moreover, very few female users accessed available drug dependent treatment services and these services are mainly not gender responsive [25, 119]. Therefore, there is a need to collect quantitative data from a much larger sample to better understand a core set of factors associated with MA initiation by gender perspectives. However, no study is yet conducted in Myanmar on factors associated with early MA initiation among males and females.

1.6.2 The early initiation of methamphetamine use and high-risk sexual behaviors in Myanmar

To date, no epidemiological research has examined the association between the early initiation of MA use and high-risk sexual behaviors (inconsistent condom use and having multiple sexual partners in the preceding six months and having a history of STI) in Myanmar or other parts of the world. This topic is particularly important in

Myanmar, which has been known as one of the key production countries for MA in Southeast Asia region [12, 81] and has the largest number of HIV-infected individuals among the adult population [120]. The HIV/AIDS epidemic in Myanmar is a concentrated one. Although the actual statistics on the HIV prevalence among the MA users are not available; however, previous studies reported that HIV risk-taking behaviors are more pronounced among MA users [18, 121, 122]. It is important to know if early initiation of MA use is associated with later high-risk sexual behavior, in order to determine if it is possible that delaying the initiation of MA use could be a prevention of high-risk sexual behaviors and thus HIV in this country.

Moreover, there may be gender specific variation in terms of the association between early initiation of MA and high-risk sexual behaviors. Female drug users may be more susceptible to STIs and HIV infections because female drug users have been observed to have higher frequency of injecting with used syringes [67, 104] than their male counterparts, and to have a higher number of lifetime sexual partners [68, 123]. In addition, female drug users have higher frequency of overlapping sexual and drug networks; that is, females are more likely than male drug users to have regular sexual partners with whom they also share drugs [107, 108]. Evidence has also shown that, female MA users practice concomitant sexual risks such as having large number of sexual partners, engaging in unsafe vaginal and/or anal sex, exchanging sex for money and/or drugs [109, 110]. Therefore, it is necessary to take into account the possible gender difference in the association between early initiation of MA and high-risk sexual behaviors.

1.7 Study objectives

This study had two objectives. The first was to examine the risk factors for the early initiation of MA use. The second was to examine the factors influencing high-risk sexual behaviors among MA drug users in Muse, Northern Shan State, Myanmar. My hypotheses are as follows:

1.7.1 Hypotheses for the early initiation of methamphetamine use in Myanmar

1. Males will initiate MA earlier than females.
2. The early initiation of MA use will be associated with first use of MA at an entertainment venue.
3. The early initiation of MA use will be associated with the reason to start to use MA and will vary by gender.
4. The early initiation of MA use will be associated with socio-demographic characteristics such as ethnicity, education, martial status, and occupation.

1.7.2 Hypotheses for high-risk sexual behaviors of methamphetamine users in Myanmar

1. The early initiation of MA use will be associated with high-risk sexual behaviors, namely inconsistent condom use, having multiple sexual partners, and history of STIs.
2. The association between the early initiation of MA and high-risk sexual behaviors will be different between genders.

2. Methods

2.1 Study design

A community-based cross-sectional study was conducted among current MA users to examine the age of MA initiation, risk factors for early MA initiation, association between the age of initiation and the user's HIV risk-taking behaviors, and factors associated with high-risk sexual behaviors. This study was conducted in Muse, Northern Shan State, Myanmar from January to March 2013.

2.2 Study area

Muse is a city located on the bank of the Shweli River in Northern Shan State. It shares a border with the Yunnan province in China (Appendix 1). The total population of the Muse Township was 130,656 in 2005. Among them, 63,850 are male and 66,606 are female [124]. The population in Muse is ethnically diverse. The main ethnic groups include the Shan, Kachin, Burma, and a number of Chinese. The city is a famous destination for seasonal and long-term workers. It also accommodates a highly mobile population of migrant workers and border-trade business people [124].

The Shan State, where Muse city is located, has a relatively long history of illicit drugs use and production. People in this state grow opium and depend on it as a cash crop [81]. The UNODC estimated that, the Northern Shan State was responsible for about 90% of opium cultivation in the country during the period of 2008 to 2011[25].

Despite opium and heroin being abundant in the region, ATS use and production has also been reported in Shan State. The majority of the MA pill seizures

in Myanmar have been routinely made near the production areas in the border towns of North Shan State [125]. The high magnitude of MA seizure suggests a large number of people are involved with MA use, production, and trafficking in border cities near China.

Apart from illicit drug use, the HIV prevalence is high among drug users in Muse city. In 2009, HIV prevalence was 36.7% among injecting drug users (IDUs) in Muse city [117]. Such a concentrated HIV epidemic may fuel further HIV infections due to the engagement in high-risk sexual behaviors among the drug users. According to the Myanmar Behavior Surveillance Survey conducted in 2008, more than a third of drug using respondents in Muse reported having sex while under the influence of MA [120].

2.3 Study participants

The study was conducted among current MA users at the time of data collection in 2013. MA user was defined as someone who had used MA at least three times in the 90 days prior to the interview [126]. Inclusion criteria for participants were the use of MA drugs within three months prior to the day of interview, aged 18 or older, not under the influence of drugs during interview, not suffering from withdrawal symptoms at the time of interview, ability to read the Myanmar language, and willingness to participate in the study voluntarily by giving an electronic informed consent. Research assistants were those who worked as social workers and medical doctors. They screened participants' withdrawal symptoms. The MA users who were under the influence of MA were rescheduled for another interview if they were still

willing to participate in the study within their respondent-driven sampling (RDS) coupons validity period.

2.4 Sample size calculation

The sample size was calculated using a software called G*Power [127, 128]. As there is no actual prevalence of early initiation of MA use available, an estimated prevalence of early initiation of MA use was considered as 50%. With 80% power, alpha level 0.05%, and an expected odds ratio of 1.5, a minimum sample size needed for male and female users was 392 each. Considering a possible dropout rate of 20%, the minimal sample size would be 470 males and 470 females.

2.5 Sampling method

Participants were recruited using RDS methods [129-131]. The sampling method is a variant of chain-referral sampling that utilizes an incentive for being interviewee and another incentive for recruiting their peers for interview. It is a widely used method in both developing and developed countries to recruit marginalized populations (also known as socially excluded populations) such as MSM, non-injecting drug users (NIDUs), and IDUs [84, 131-135].

This type of sampling begins by selecting the initial participants of non-randomly selected members of the target population. They are known as seeds in the study. The seeds initiate the chain referral by introducing a fixed number of peers to be recruited for the study. Such recruits in turn introduce their other peers. The process is continued until the target sample size is attained. Links among peers are recoded using anonymous identification numbers. Each respondent is allowed to recruit up to three

people to participate in the survey (i.e. given 3 recruitment coupons). Coupons are given a two week expiry date depending on the settings [84].

2.6 Recruitment protocols

The same recruitment protocol was used to recruit male and female MA users. In this study, the "leaders" of MA users were recruited from each target group as the main seeds (recruited first study participants) for the RDS sampling. The leaders were recruited with the help of the National Drug User Network, local MSM network members, brothel and local highway car associations, and local youth volunteer groups. A total of eight leaders (4 males and 4 females) thus, became the first seeds.

The main seeds were interviewed and requested to recruit three other MA users to take part in this study. They recruited drug users from different sections of the population including MSM, female sex workers (FSWs, students, laborers, housewives, and highway drivers. In the second wave, the already recruited MA users recruited three other MA user friends after completing their interviews. Each respondent was allowed to recruit up to three other people to participate in the survey within the two-week coupon expiration date.

Participants received incentives for their participation. Such incentives included a compensation of 2000 kyats ($2.50) for their time and transportation after the interview. They were eligible to receive a secondary incentive after the expiration period of their recruitment coupons, or if all three referred peers had already participated in the study [136]. The secondary incentive was a steel cup for the general MA population or lubricant gel for FSWs and MSM. The cost of the secondary incentive was equivalent to 900 Kyat (approx. $ 1.20) per recruitment (Appendix 11).

The other respondents were given the same opportunities as the first respondents for further recruitment and incentives.

2.7 Questionnaires and pre-testing

The questionnaire was adopted from the UNODC standardized instrument [137]. The questionnaire was structured into the major domains of socio-demographic characteristics, ATS drug use behaviors, and awareness/knowledge of MA use. Most of the items used 0 (No), 1 (Yes), 88 (Don't know), and 99 (No response) as the response scale. Questions related to sexual behaviors and other drugs use behaviors were adopted from the behavioral surveillance survey (BSS 2007-2008). This BSS survey questionnaire was initially developed by Family Health International. Reliability testing and validation of the questionnaire has already been performed in Myanmar among drug users [84, 138, 139]. Questions on sexual behavior were also prepared in a colloquial language, using explicit wording to describe sexual practices. The questionnaire was then translated from English to the Myanmar language (Appendix 8 and 9).

In addition, two focus group discussions were carried out to learn more about the current trend of ATS use and other useful information for finalizing the questionnaire. The questionnaire was pre-tested by researchers in Lashio City, Northern Shan State in October 2012. Then it was corrected for any inconsistencies or anomalies and any suggestive points were added before finalizing the instrument for data collection. The pre-test was conducted with 30 male and 20 female ATS users. Later, the questionnaire was modified based on the results of the pre-test and focus

group discussions to make it more understandable and easier for participants to answer.

The questionnaire was then translated from English to the Myanmar language (Appendix 8 and 9). Back-translation of the instrument from the Myanmar language to English was done after the pre-test to ensure semantic equivalence. Three Myanmar public health experts who are working on drug use and sexual behavior issues in Myanmar also reviewed the study questionnaire. Programmers then converted the modified and pre-tested questionnaire into an electronic format so that, the computer-assisted self-interviewing (CASI) could be carried out (Appendix 10). The CASI system was also pre-tested among five MA users in Yangon. The CASI sections were structured as follows:

1) Socio-demographic characteristics

The socio-demographic characteristic included gender, age, marital status, ethnicity, education, occupation, and living status (i.e. local inhabitant of Muse or migrant from another part of Myanmar).

2) Knowledge of different amphetamine-type stimulants

In this section, the questions covered type of ATS use, difference between all types of ATS, and knowledge on the effects of ATS use.

3) MA use characteristics

This section covered questions on MA first use, such as age at initiation, place of first time use, the reason of first MA use, sources of first time MA access, method of

administration at first time use, and history of injection use of MA, as well as detail assessment of current MA use frequency.

4) Opiate drug use behaviors

The questions of other drugs use were assessed in this section. The questions included heroin use in the past six months, opium and other drug use in the past six months and routes of administration of opiates and other drug use behaviors.

5) Sexual behaviors and other characteristics

The sexual behavior characteristics section included the age of initiation of sexual intercourse, sexual practice, inconsistent condom use, and multiple sexual partners in the preceding six months. Other characteristics were history of STIs, use of MA before and during sex, if ever exchanged sex for money or drugs, ever attempted to commit suicide due to MA use, and ever been to prison due to drug related problems.

2.8 Measures

2.8.1 The early initiation of methamphetamine use

The age of initiation of MA use was measured as continuous variable and later it was coded as a binary variable (early versus late), based on the average age of completion of high school at 17 years. This is the age at which most of the students start to be independent by going to work or to go to college/university [140]. Living independently may lead to poor parental supervision and monitoring which may be responsible for the increased risk of the initiation of substance use [141, 142]. Therefore, in order to make consistency between male and female, the early age of

initiation for MA use was considered as 17 years or younger and dichotomized as“1” if the participants initiated MA use at age 17 years or younger and “0” otherwise.

2.8.2 High-risk sexual behaviors of methamphetamine users

To assess the individuals’ sexual risk-taking behaviors three HIV risk related outcome variables of high-risk sexual behaviors were measured. [143]. The high-risk sexual behaviors were defined as incorrect and/or inconsistent condom use across every incidence of sexual intercourse, having had more than two partners (had multiple sex partners) during past six months and having ever been diagnosed with an STI [73]. A composite variable of risky sexual behaviors is a more realistic method of examining high risky sexual behavior than using a single risky behavior. This is because participants might reduce their risk through one set of behaviors while increasing risk in another set of behaviors. This phenomenon is known as risk compensation. For example, participants might “compensate” for increasing their condom use by concomitantly increasing the frequency of intercourse or by increasing their number of sexual partners [144]. To overcome this potential limitation, an outcome variable was constructed as a composite variable of three risky sexual behaviors including inconsistent condom use, multiple sexual partners and had a history of STI. These variables were considered as high-risk sexual behaviors in this study that included: “two direct measures” (inconsistent condom use and had multiple sexual partners in the preceding six months) and one “indirect measure” (had a history of STI) [73]. The resulted variable was then dichotomized into “0” as (no risk) and “1” as (engaged in high-risk sexual behaviors) [73].

2.8.3 Covariates

2.8.3.1 For analysis of factors associated with early initiation of methamphetamine use

In this study, socio-demographic characteristics, first time and current MA use characteristics and behaviors, other types of drug use behaviors, and sexual behaviors and other characteristics were considered as the independent variables. The socio-demographic variables included current age, marital status, current living status, educational background, ethnic group, and occupation. Current age was used as a proxy of birth cohort (being born earlier or recently), and it was divided into two groups (≤ 23 and > 23) using the mean age of participants. Age was included here because alcohol and drug initiation were different among generations [145, 146]. There is evidence that educational level may possibly play a pivotal role in the etiology of illegal substance use initiation and continuation and risky sexual behavior [147-149] so a variable for the participant's educational level was created in terms of the formal education system of Myanmar: primary (1-5 years), secondary (6-9 years), high school (10-11 years), and university and higher (12 years of education or more).

Marital status was categorized as never married versus ever married. Ethnicity was found to be a strong predictor of illegal substance use initiation and continuation in both cross-sectional and longitudinal studies [146, 150-152]. In this study, ethnicity was categorized Shan, Kachin, Burma, and others (Kayar, Kayin, Chin, Mon, Rakkhin, multi-ethnicity, local residence of India and Chinese). Employment status was categorized as unemployed versus employed.

Studies [153, 154] suggest that, drug use and early initiation of illegal substances are related to geographic patterns and place where drug are easily accessible. Therefore, place of first time MA use and categorized it as: house (own/drug dealer's/friend's/sexual partner's), school/dormitory/work place, or entertainment venues were created. Reason for first MA use was categorized in the following manner: encouraged by friend/sexual partner/drug dealer, to lose bodyweight/for work related purpose or curiosity about MA effects/for fun. Psychological characteristics included: ever exposed to suicidal ideation, and ever attempted to suicide. Furthermore, sexual behavior related variables such as having ever exchanged sex for money or drugs, sexual orientation, and having a history of STIs were also included.

2.8.3.2 For analysis of factors associated with high-risk sexual behaviors of methamphetamine users

The socio-demographic variables included current age, education, ethnicity, marital status, occupation and current living status. MA use and other drugs use behavior related characteristics included frequency of MA use, history of MA injection, heroin use behaviors and poly ATS use behaviors. The available literature suggests that stress and reduced social support caused by migration, less personal control over the decision to move [155], reduced contact with close friends after moving [156] and the stress of adapting to a new school and friends [157] may also play an important role in initiation and continuation of illegal substance and risky sexual behavior. Therefore, a variable was created to define residency status of the participants and categorized as permanent

resident versus migrant. A number of studies have suggested a link between frequency of drug and alcohol use and sexual behavior [158, 159], people who drink more heavily are more likely to have multiple partners and less likely to use condoms. Therefore, the variable frequency of MA use was created and categorized as: > 3 times a month, once a week, > 4 times a week, or ≤ 4 times a week.

The available literature suggests that, poly drug use can lead to more adverse health consequences than mono-drug use and may increase sexual activity and therefore may lead to greater risk for HIV and other STIs [160, 161], so a variable was created to define 'had used more than two types of ATS' as yes versus no**.** Because MA drug users may also receive others illegal drug in the same class as cocaine and other powerful street drugs mainly heroine, therefore a variable was also created to define whether MA users used heroin within past six months. In addition, sexual behavior variables such as sexual orientation, sex worker visit, and MA use before sex and during sex were also assessed.

2.9 Operational definitions

This study used the following operational definitions to classify MA users, early initiation of drug use, the high-risk sexual behaviors and risky sexual behaviors [73, 126, 162, 163].

MA users are defined as those who used MA at least three times in the last 90 days prior to the interview [126].

The early initiation of MA use is defined as 17 years or younger for both males and females based on the average age of completing high school level at 17 years in Myanmar [140].

The high-risk sexual behaviors are defined as incorrect and/or inconsistent condom use across every incidence of sexual intercourse, having had more than two partners (had multiple sex partners) during past six months and having ever been diagnosed with an STI [73].

HIV-risk taking behaviors are defined as participants' behaviors that increase likelihood of contracting STIs including HIV [61-64, 164].

2.10 Data collection

The five supervisors (coupon managers) and nine MA peer CASI interview assistants helped to collect the data with CASI interviews. The coupon managers and the supervisors and CASI interview assistants attended a one-day training prior to conducting the survey to learn the study objectives, procedures, and the importance of maintaining the confidentiality of the participants' information. The coupon managers and MA peer CASI interview assistants were three medical doctors, two medical students, three former injecting drug users, two MSM peer educators, and four social workers, those having good knowledge of the target population. The training was done using a field manual that was developed in the Myanmar language. The field supervisor also went along to the study sites and supervised the fieldwork to assure interview quality.

Data were collected in a private place using a self-administered computer program known as the CASI. CASI is a self-administered computer program that improves data collection concerning socially undesirable behaviors, particularly among high-risk populations [165-167]. In this study, the program requested participants to complete surveys on a laptop computer [166, 167]. Each CASI interview took 35- 45 minutes to complete. Data were collected in various settings including motel rooms, participants' house, place of drug use, work place, or in the project mobile car, dependent on the participant's preferences.

2.11 Data quality control

Data quality assurance-mechanisms were used at several points during the research process. The supervisors checked for missing data and inconsistencies, and carefully reviewed all questionnaires. Trained personnel under the continuous supervision of a principal researcher checked the data. During the study period regular meetings were held with the interviewers in order to increase the quality of collected data, by providing feedback to the CASI interview assistants and supervisors themselves.

2.12 Data analysis

Data were analyzed using both descriptive and multivariate analyses. The descriptive analysis was conducted to examine the socio-demographic, sexual risk behavior and MA use characteristics of participants according to gendered patterns. The Cox regressions, multiple logistic regressions, and generalized estimating equation (GEE) models were applied in this study. Odds ratios (OR) were estimated to assess the

strength of the associations using 95% confidence intervals (CIs) for significance testing. In all analyses, the level of significance was set at $p<0.05$ (two-tailed).

To determine factors associated with age of MA initiation, Cox proportional-hazards regression models were performed for males and females separately. In addition, to learn contribution of these factors to the early initiation of MA use defined in this thesis, two gender-stratified multiple logistic regression models (Model I and Model II) were performed. In the Cox proportional hazard regression and the model I logistic regression, variables which surely happened before the use of MA such as place of MA first use, reason of MA first use, source of first time MA access, and route of administration of first time use and socio-demographic characteristics such as age, marital status, education, ethnicity, and employment status were entered in the models. Furthermore, the variables of ever having exchanged sex for money or/and drugs, ever being diagnosed with an STI, ever experiencing suicidal ideation, and ever attempting suicide were included in multiple logistic models II. In the logistic regression models, the early initiation of MA use was the binary outcome variable, which was dichotomized by assigning "1" if the participants initiated MA use in 17 years and younger and "0" if otherwise. To compare the gender difference in the early initiation of MA use, the Kaplan-Meier curve is plotted and the Log-rank test was also performed.

Three multiple logistic regression models were performed by gender to analyze three indicators of high-risk sexual behavior (inconsistent condom use, had multiple sexual partners in the preceding six months, and had a history of an STI). However, analyses examining separate risky sexual behavior outcomes, such as percent inconsistent condom use, can yield inaccurate results in HIV and STIs prevention trials

because participants might reduce their risk in one risk behavior or set of behaviors while increasing risk in another set of behaviors, a phenomenon known as risk compensation. For example, participants might compensate for increasing condom use by simultaneously increasing frequency of intercourse or by increasing multiple sexual partners [144]. To overcome this potential limitation, these three outcome variables (inconsistent condom use, had multiple sexual partners in the preceding six months, and had a history of STI) were considered as high-risk sexual behaviors outcome variable. This outcome variable was coded as "0" low risk and "1" as engaged in inconsistent condom use, to have had multiple sexual partners within the preceding six months, and to have a history of an STI [73].

Furthermore, these three indicators of risky sexual behavior assessed in this study tend to be correlated for any given individual [73]. To accommodate these interrelationships, a GEE approach was applied. The GEE logistic regressions were used to detect differences in profiles of risky sexual behaviors across the male and female groups as well as the groups defined via other covariates. This method is similar to that used to examine multiple indicators of high-risk sexual behaviors [73], depressive or panic symptoms [168] and drug dependence symptoms [169]. All data analyses were conducted using the Statistical Package for the Social Sciences (SPSS) 18.0 software (Chicago, Illinois, USA).

2.13 Ethical considerations

This study was approved by the Research Ethics Committee of Graduate School of Medicine, the University of Tokyo, Tokyo, Japan (Appendix 6). Moreover, approval to

conduct this study in Myanmar was obtained from the Ethical Review Committee, Defence Services Medical Research Centre, Naypyidaw, Myanmar (Appendix 7).

The study followed all applicable ethical standards. The objectives of the study were made clear to respondents before participation (Appendix 2 and 3). For individual interviews, the privacy needs and personal perferences of each respondent were given special attention. All the participants were given time to decide on their voluntary participation and involvement. They were also informed that they could skip answering any question they did not want to answer, and could withdraw from participation at any time during or after the interview without penalty. If participants fully understood and decided to participate, they were requested to read about informed consent on the computer screen and click "agree to participate in this survey" to answer the survey questions. A computer-based informed consent forms mentioning the study objectives and purpose of research was obtained from all respondents (Appendix 4 and 5), and the confidentiality of the entire data were carefully maintained.

3. Results

3.1 Participants of the study

In total, 1,385 (782 males and 603 females) self-reported MA users were recruited to participate in this study. A total of 23 participants (7 males and 16 females), dropped out of the study, did not complete the questionnaire, or did not answer the outcome variables. Therefore, the data of 1,362 participants (775 males and 587 females) were available for preliminary analyses. Furthermore, a total of 180 participants (4 males and 176 females) were excluded as they missed to answer at least one outcomes measurement of sexual behaviors and those who had never had sex. The sample for high-risk sexual behaviors of MA users consisted of 771 males and 411 females (**Figure.1**).

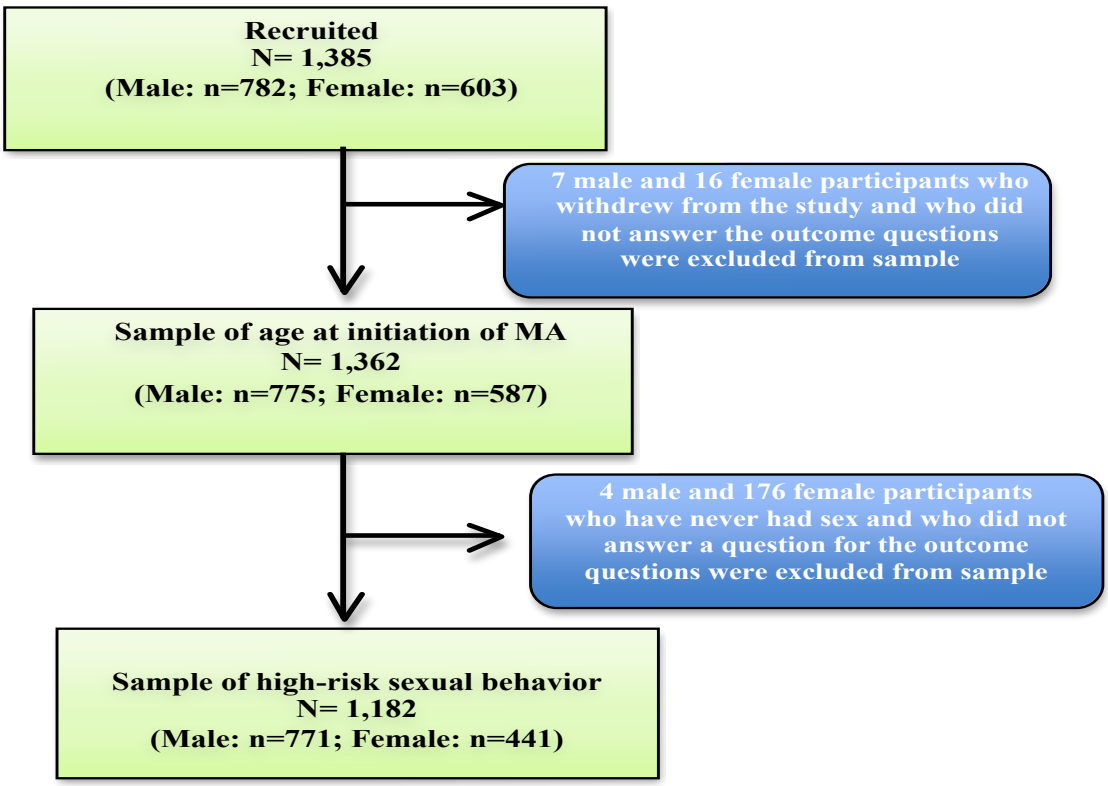


Figure 1. Selection of participants who were included in the analyses

3.2 Socio-demographic characteristics of all participants

The socio-demographic characteristics of all participants are shown in **Table 1**. Of the 1,362 participants, 56.9% (n= 775) were males, and their mean age was 23.4 years [standard deviation (SD) 3.64]. The majority of participants belonged to the Shan 416 (30.6%) or Burma 409 (30.0%) ethnic groups.

Among total participants, 936 (68.7%) reported as being single, with the remainder reporting as either currently married (426, 31.3%). Regarding educational status, 607 (44.6%) reported having a secondary level of education, while 302 (22.2%) reported having university education. Of total, 983 (72.2%) were employed at the time of interview, and 825 (60.6%) had migrated from another part of Myanmar [**Table 1**].

Table.1 Socio-demographic characteristics of participants (N=1362)

Characteristics	Total (N=1362)		Male (N=775)		Female (N=587)	
	N	%	N	%	N	%
Age* (year)						
≤ 20	336	24.7	165	21.3	171	29.1
21 - 24	739	54.3	421	54.3	318	54.2
26-28	223	16.3	145	18.7	78	13.3
≥ 29	64	4.7	44	5.7	20	3.4
Marital status						
Never married	936	68.7	553	71.4	383	65.2
Ever married	426	31.3	222	28.6	204	34.8
Education						
Primary school	134	9.8	54	7.0	80	13.6
Secondary school	607	44.6	304	39.2	303	51.6
High school	319	23.4	210	27.1	109	18.6
University	302	22.2	207	26.7	95	16.2
Ethnicity						
Shan	416	30.6	213	27.5	203	34.6
Kachin	274	20.1	158	20.4	116	19.8
Burma	409	30.0	218	28.1	191	32.5
Others	263	19.3	186	24	77	13.1
Employment status						
Unemployed	379	27.8	188	24.3	191	32.5
Employed	983	72.2	587	75.7	396	67.5
Location						
Resident	537	39.4	335	43.2	202	34.4
Migrant	825	60.6	440	56.8	385	65.6

* Mean age 23.4 years (Standard Deviation SD 3.46) for males and 22.7 years (SD 3.38) for females.; [#] Others included Kyar, Kayin, Chin, Mon, Rakkhin, multi-ethnicity, India, and Chinese.

3.3 Knowledge and beliefs about methamphetamine use stratified by gender

Table 2 shows participant's knowledge and beliefs about MA use stratified by gender. Male participants were having higher percentage of knowledge about the different forms of ATS drugs compared with females (32.3% versus 22.0%). Conversely, female participants were more likely to believe that MA can create feelings of euphoria (99.1% versus 92.9%), can have hallucinatory effect (98.8% versus 96.8%), can cause insomnia/sleeplessness (98.0% versus 93.8%), or can decrease appetite (97.8% versus 89.8%).

In addition, female participants believed that MA can increase sexual desire (91.5% versus 75.2%), and lengthen sexual intercourse (89.9 % versus 73.7%), and to have knowledge about the potential for use of the drug to lead to unsafe sexual acts (88.1% versus 72.9%), or violent activities/uncontrolled behaviors (74.4% versus 72.9%).

Table 2. Knowledge and beliefs about methamphetamine use stratified by gender

	Male		Female	
	N	%	N	%
Know the difference between ATS drugs				
No	525	67.7	458	78.0
Yes	250	32.3	129	22.0
MA can increase energy				
No	6	0.8	0	0
Yes	769	99.2	587	100
MA can cause irregular heartbeat (Faster or weak heartbeat)				
No	6	0.8	2	0.3
Yes	769	99.2	585	99.7
MA can cause feelings of euphoria				
No	55	7.1	5	0.9
Yes	720	92.9	582	99.1
MA can cause hallucinations				
No	25	3.2	7	1.2
Yes	750	96.8	580	98.8
MA can cause feelings of depression				
No	106	13.7	7	1.2
Yes	669	86.3	580	98.8
MA can cause insomnia/sleeplessness				
No	48	6.2	12	2.0
Yes	727	93.8	575	98.0
MA can lead to decreased appetite				
No	79	10.2	13	2.2
Yes	696	89.8	574	97.8
MA can cause increased sexual desire				
No	192	24.8	50	8.5
Yes	583	75.2	537	91.5
MA can increase the risk of engaging in unsafe sex				
No	210	7.1	70	11.9
Yes	565	72.9	517	88.1
MA can make sexual intercourse last longer				
No	204	26.3	59	10.1
Yes	571	73.7	528	89.9
MA can lead to violence/uncontrolled behaviors				
No	210	27.1	150	25.6
Yes	565	72.9	437	74.4

3.4 Reasons for methamphetamine initiation

Figure 2 shows reasons for MA initiation among the participants. The main reason for both genders was encouragement by friends (males 32.9 %; females 29.6%). In males, the second most common reason given was curiosity about its effects (males 31.2%; females 17.7%), whereas in females it was to lose body weight (males 8.8%; females 27.1%).

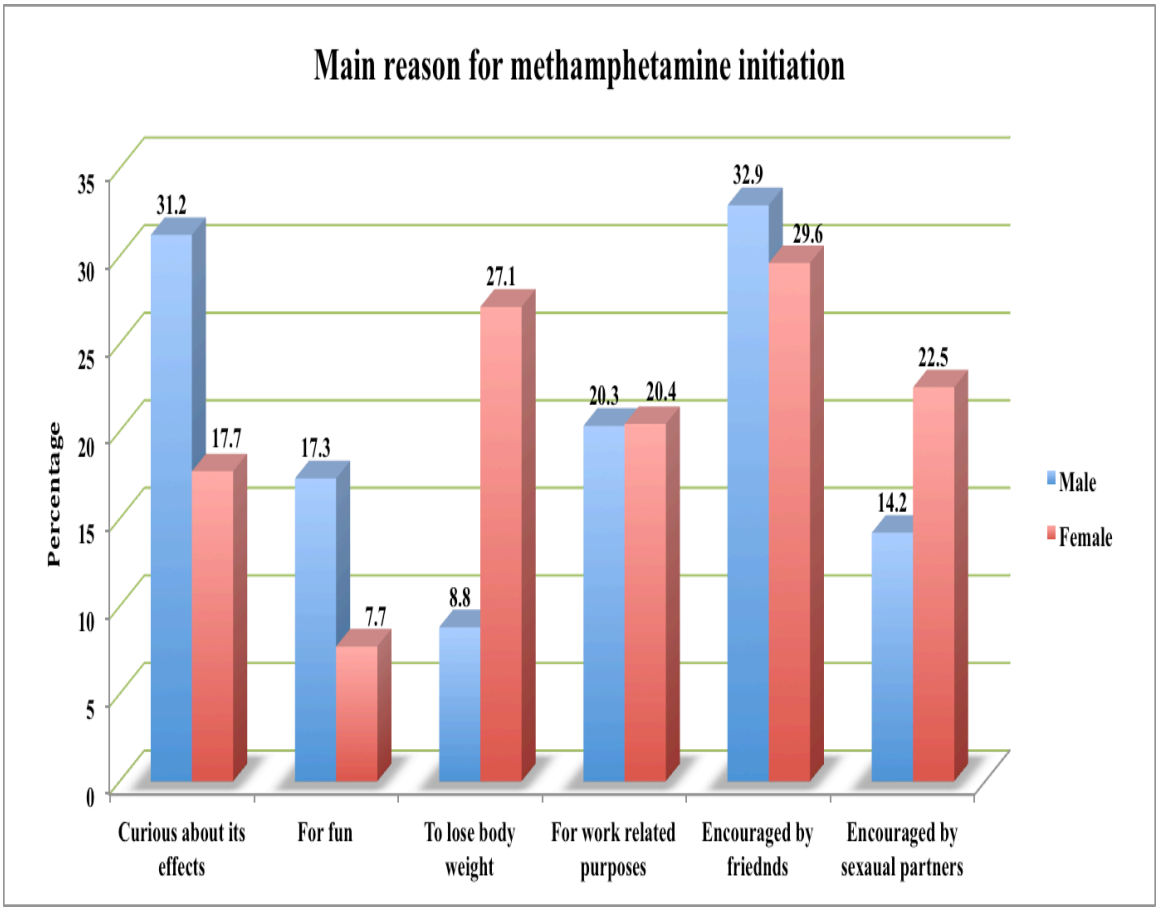


Figure 2. Main reason of methamphetamine initiation, stratified by gender3.5 Age of initiation of methamphetamine use

Figure 3 shows the percentages of age at MA initiation, stratified by gender. The median and the range of age at MA initiation for males were found to be 16 (10, 29) and for females, it were 17 (9, 27). The majority of males (n=193, 24.9%) initiated MA at 16 years old, and then started to decline until the age 29. The peak age of MA initiation for female was 18 years (n=121, 20.6%).

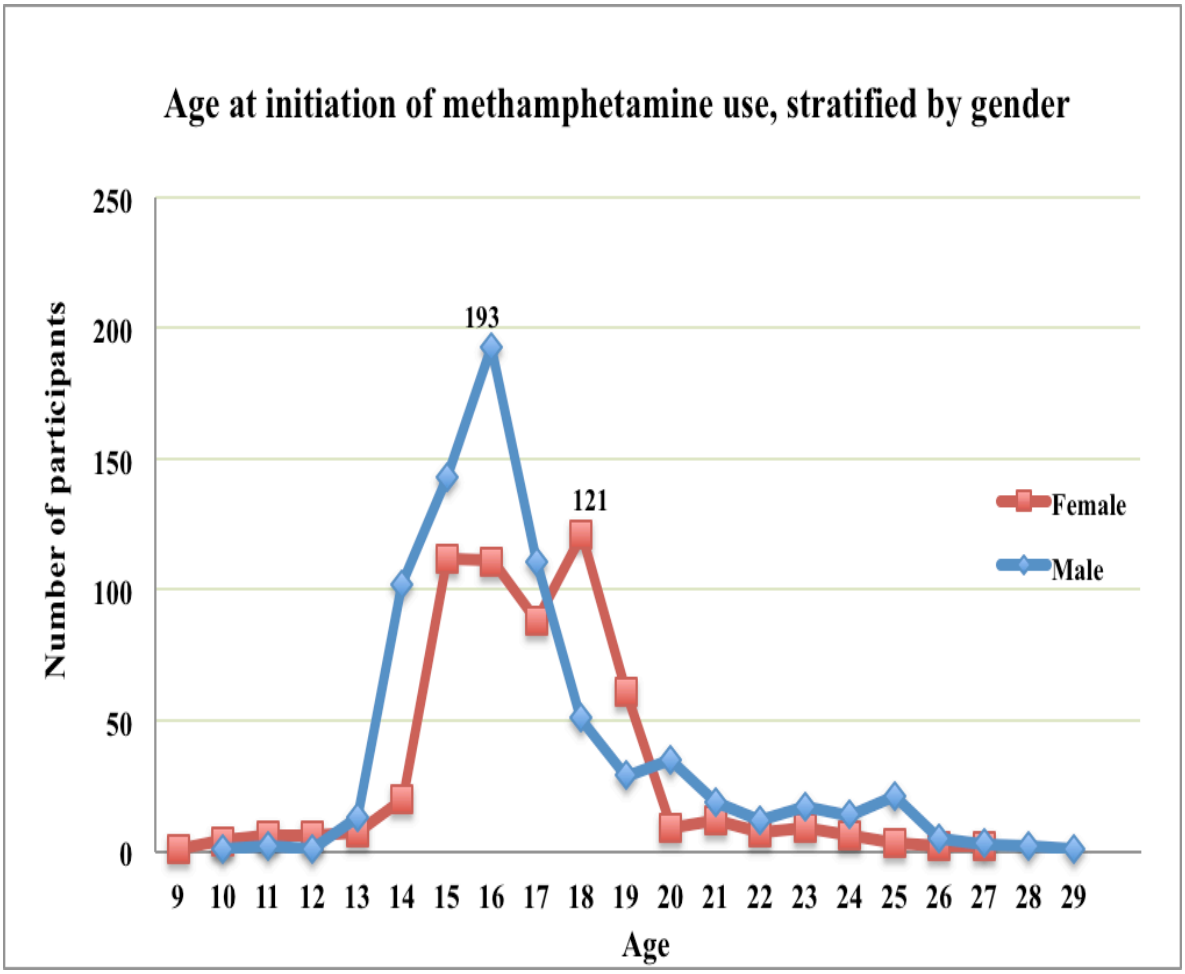


Figure 3. Age at initiation of methamphetamine, stratified by gender

Figure 4 presents the median age of MA initiation, stratified by gender. The rate of early initiation of MA was 73.0 % among male users (n=563). For female, over 60.5% (n=355) initiated MA before their 18th birthday.

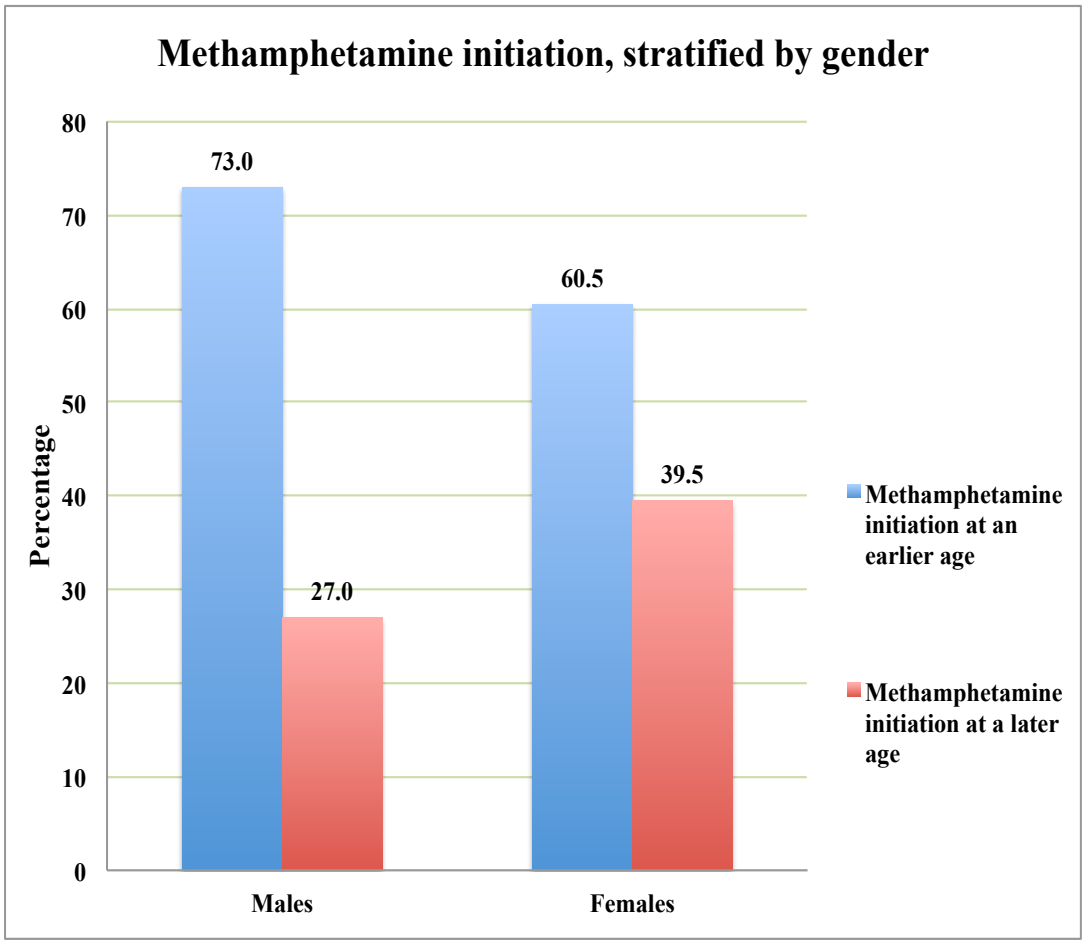
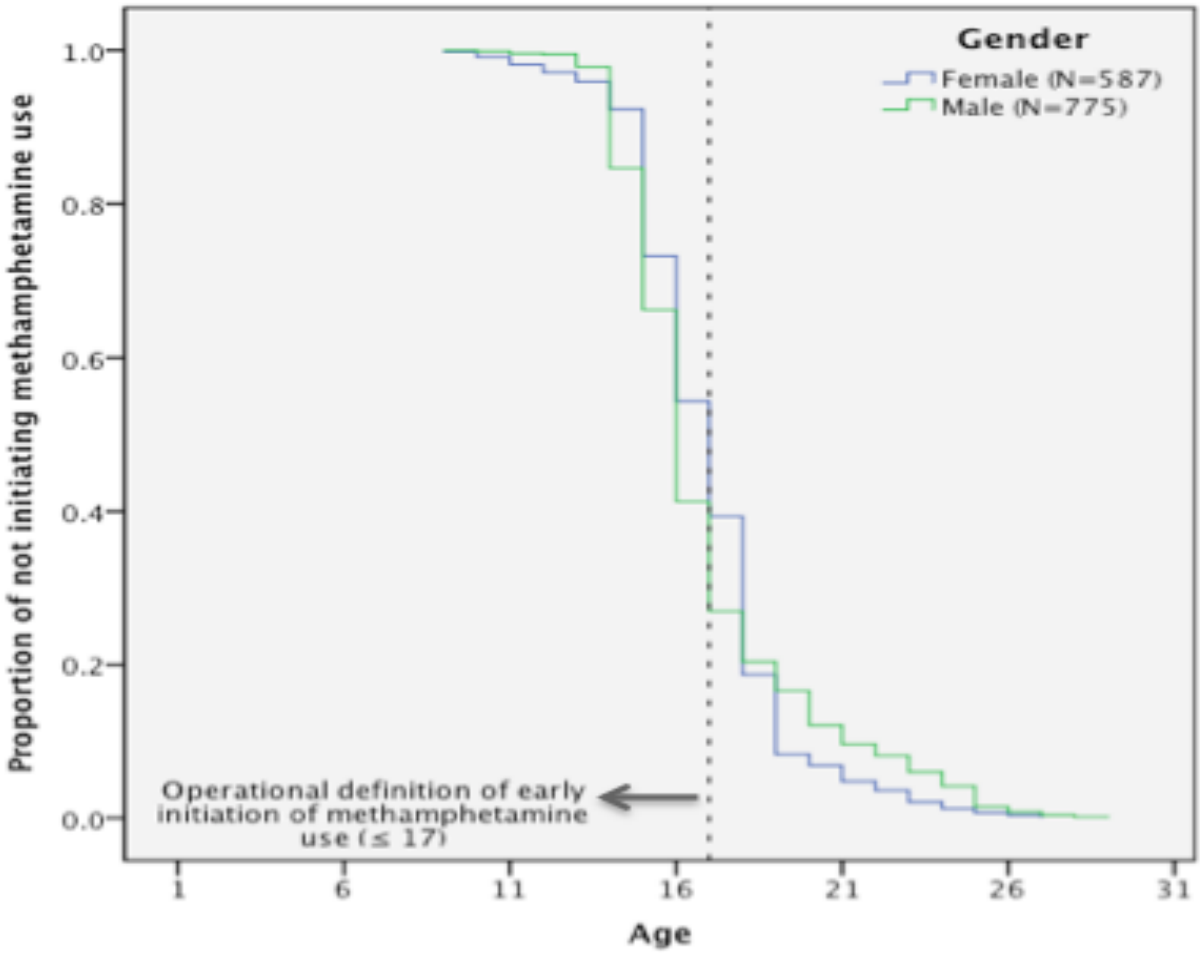


Figure 4. Percentage of methamphetamine initiation, stratified by gender

Figurer 5 presents Kaplan-Meier estimates of age at MA initiation by gender among MA users in Myanmar. Male users showed a significantly higher risk of early initiation of MA use [hazard ratio1.35; 95% confidence interval, 1.18-1.54].



Hazard ratio 1.35 (95% CI: 1.18-1.54) p <0.001 (Log-rank)

Figure 5. Kaplan-Meier curve of age at methamphetamine initiation by gender among methamphetamine users in Myanmar

3.6 Cox regression analyses of factors associated with age of methamphetamine initiation, stratified by gender

Tables 3 and 4 show the results of the unadjusted and adjusted relative hazards of age of MA initiation for both males and females. As shown, in the multivariate cox regression analysis [**Table 3**], being older (adjusted relative hazards [AHR] = 0.73; 95% confidence interval [CI]: 0.58–0.91), and the participants who belonged to other ethnicity (AHR=0.72, 95%CI: 0.57-0.92) were negatively associated with age of MA initiation.

Male participants who used MA for the first time at an entertainment venue (AHR=1.55, 95%CI: 1.26-1.90), those who gave the reason for their first time MA use as being either to lose body weight or for work related purpose (AHR=1.54, 95%CI: 1.21-1.96), and who used MA for the first time because of curiosity about its effects or for fun (AHR=1.79 95%CI: 1.40-2.29), were positively associated with age of MA initiation. Moreover, the participants who bought MA by themselves or who asked someone to buy for them (AHR=1.50, 95%CI: 1.26-1.79) were also positively associated with age of MA initiation. Being employed and belonging to Burma ethnic group were also negatively associated with age of MA initiation in the unadjusted model, but were no longer significant in the adjusted model [**Table 3**].

For females, the multivariate cox regression analysis revealed that the participants who belonged to Kachin (AHR=0.68, 95%CI: 0.50-0.92) or Burma (AHR=0.70, 95%CI: 0.52-0.95) ethnic group were negatively associated with age of MA initiation. On the other hand, the female participants who had high school or above level of education (AHR= 1.26; 95% CI: 1.00-1.59), participants who used MA for the first time at an entertainment venue (AHR=2.67, 95% CI: 1.81-3.10), and at a

school or dormitory or workplace (AHR=1.76, 95% CI: 1.06-2.92), were positively associated with age of MA initiation. Those who gave reason for their first time MA use as being either to lose body weight or for work related purpose (AHR=1.60, 95%CI: 1.23-2.11) and who use MA for the first time because of curiosity about its effects or for fun (AHR= 2.19, 1.64-2.92) were also positively associated with age of MA initiation [**Table 4**].

Table 3. Bivariate and multivariate Cox regression analyses of factors associated with age of methamphetamine initiation among male users (N=775)

	N	%	Unadjusted HR	95%CI	Adjusted HR†	95%CI
Age						
≤ 23	437	56.4				
> 23	338	43.6	**0.55**	**0.46-0.66**	**0.73**	**0.58-0.91**
Marital status						
Never married	553	71.4				
Ever married	222	28.6	0.64	0.52-0.78	0.87	0.70-1.80
Education						
Secondary school and below	358	46.2				
High school or above	417	53.8	1.01	0.86-1.20	0.92	0.77-1.11
Ethnicity						
Shan	213	27.5				
Kachin	158	20.4	0.94	0.75-1.18	0.90	0.71-1.14
Burma	218	28.1	**0.67**	**0.53-0.83**	0.83	0.65-1.07
Others	186	24.0	**0.71**	**0.57-0.90**	**0.72**	**0.57-0.92**
Employment status						
Unemployed	188	24.3				
Employed	587	75.7	**0.72**	**0.60-0.87**	0.95	0.76-1.17
Sexual orientation						
Hetero-sexual	325	41.9				
Bi-/Homo-sexual	450	58.1	0.88	0.74-1.04	1.14	0.96-1.15
Place of methamphetamine first use						
House (own/drug dealer's/ friend's/sexual partner's)	218	28.1				
School/dormitory/ work place	121	15.6	1.09	0.82-1.44	1.23	0.91-1.65
Entertainment venues#	436	56.3	**1.56**	**1.28-1.90**	**1.55**	**1.26-1.90**
Reason of methamphetamine first use						
Encouraged by friend/sexual partner/drug dealers	308	39.7				
To lose bodyweight/for work related purpose	173	22.3	**1.55**	**1.23-1.96**	**1.54**	**1.21-1.96**
Curious about methamphetamine effects/for fun	294	38.0	**1.75**	**1.39-2.21**	**1.79**	**1.40-2.29**

Table 3 continues to next page

(Table 3 continued)

	N	%	Unadjusted HR	95%CI	Adjusted HR†	95%CI
Source of first time methamphetamine access						
Sexual exchanged/freely offered/provided by employer	353	45.5				
Got someone to buy/ bought oneself	422	54.5	**1.51**	**1.28-1.79**	**1.50**	**1.26-1.79**
Route of administration of first time use						
Inhalation	727	93.8				
Drunk/smoked/injected	48	6.2	1.30	0.93-1.81	1.38	0.98-1.95

Note. HR = hazard ratio; CI=confidence interval.; #(Club/karaoke/restaurant/hotel/guest house/ game center).

†All the variables were simultaneously entered in the models.

Table 4. Bivariate and multivariate Cox regression analyses of factors associated with age of methamphetamine initiation among female users (N=587)

	N	%	Unadjusted HR	95%CI	Adjusted HR†	95%CI
Age						
≤ 23	358	61.0				
> 23	229	39.0	0.89	0.71-1.10	0.95	0.70-1.29
Marital status						
Never married	383	65.2				
Ever married	204	34.8	0.97	0.78-1.21	1.01	0.78-1.30
Education						
Secondary school and below	383	65.2				
High school or above	204	34.8	1.12	0.90-1.39	**1.26**	**1.00-1.59**
Ethnicity						
Shan	203	34.6				
Kachin	116	19.8	**0.72**	**0.54-0.97**	**0.68**	**0.50-0.92**
Burma	191	32.5	**0.75**	**0.58-0.96**	**0.70**	**0.52-0.95**
Others	77	13.1	0.86	0.61-1.20	0.81	0.57-1.17
Employment status						
Unemployed	191	32.5				
Employed	396	67.5	0.86	0.70-1.07	0.89	0.70-1.12
Place of methamphetamine first use						
House (own/drug dealer's/ friend's/sexual partner's)	175	29.8				
School/dormitory/ work place	39	6.7	1.30	0.79-2.13	**1.76**	**1.06-2.92**
Entertainment venues#	373	63.5	**2.10**	**1.62-2.72**	**2.67**	**1.81-3.10**
Reason of methamphetamine first use						
Encouraged by friend/ sexual partner/drug dealers	190	32.4				
To lose bodyweight/for work related purpose	242	41.2	**1.71**	**1.32-2.22**	**1.60**	**1.23-2.11**
Curious about MA effects/for fun	155	26.4	**1.94**	**1.47-2.58**	**2.19**	**1.64-2.92**

Table 4 continues to next page

(Table 4 continued)

	N	%	Unadjusted HR	95%CI	Adjusted HR†	95%CI
Source of first time methamphetamine access						
Sexual exchanged/freely offered/provided by employer	354	60.3				
Got someone to buy/ bought oneself	233	39.7	1.11	0.90-1.37	1.12	0.89-1.40
Route of administration of first time use						
Inhalation	580	98.8				
Drunk/smoked/injected	7	1.2	S/S		S/S	

Note. HR = hazard ratio; CI=confidence interval.; #(Club/karaoke/restaurant/hotel/guest house/ game center).

†All the variables were simultaneously entered in the models

3.7 Multiple logistic regression analyses of early initiation of methamphetamine use, stratified by gender

Tables 5 and 6 show the results of the multiple logistic regression analyses for males and females. In model I, socio-demographic factors (age, marital status, education, ethnicity, employment status, and sexual orientation) and the first time MA use characteristics (place of MA first use, reason of MA first use, source of first time MA access, and route of administration of first time use) were included. In model II, sexual risk-taking behaviors (ever had exchanged sex for money or/and drugs, and ever diagnosed with an STI), and suicidal behaviors were added to model I.

Among males, in model I, factors associated with an increased likelihood of MA initiation in early age included: having bi-/homosexual preferences (adjusted odds ratio [AOR] 1.57, 95% CI: 1.07-2.29), having used MA at the entertainment venues (AOR = 3.08; 95% CI: 2.03-4.65), having used MA either to lose body weight or for work related purposes (AOR = 1.61; 95%CI: 1.02-2.54), having used MA for the first time because of curiosity about its effects or for fun (AOR = 2.84; 95% CI: 1.74-4.65), and having bought MA by oneself or got someone to buy (OR = 2.57; 95%CI: 1.77-3.71). Conversely, older age (AOR = 0.39; 95% CI: 0.25-0.60) and being employed (AOR = 0.72; 95% CI: 0.43-1.20) were negatively associated with early MA initiation. In model II, the socio-demographic factors and the first time MA use characteristics remained statistically significant and suicidal attempts were positively associated with early MA initiation (AOR= 2.27; 95% CI: 1.27-4.07) [**Table 5**].

Among females, in model I, the multiple logistic regression analysis revealed that the participants who belonged to Kachin (AOR= 0.51; 95% CI: 0.31-0.85) ethnic

groups were less likely to report early MA initiation. On the other hand, participants who used MA for the first time at an entertainment venue (AOR = 4.06; 95% CI: 2.67-6.17) and at a school or dormitory or workplace (AOR = 2.56; 95% CI: 1.19-5.53) were more likely report early MA initiation. Those who gave the reason for their first time MA use as being either to lose body weight or for work related purpose (AOR = 1.89; 95% CI: 1.21-2.93) and who used MA for the first time because of curiosity about its effects or for fun (AOR = 3.30; 95% CI: 2.00-5.45) were also similar to them. In model II, the first time MA use characteristics remained statistically significant and participants who ever exchanged sex for money and/or drugs (AOR = 2.04; 95% CI: 1.28-3.26) were more likely to have initiated MA use earlier [**Table 6**].

Table 5. Multiple logistic regression analysis of factors associated with early initiation of methamphetamine use among male users (N=775)

			Model I [a]		Model II [b]	
	N	%	AOR	95%CI	AOR	95%CI
Age (current age at survey)						
≤ 23	437	56.4				
> 23	338	43.6	**0.39**	**0.25-0.60**	**0.38**	**0.24-0.60**
Marital status						
Never married	553	71.4				
Ever married	222	28.6	0.78	0.51-1.17	0.74	0.49-1.13
Education						
Secondary school and below	358	46.2				
High school or above University	417	53.8	0.71	0.48-1.05	0.73	0.49-1.08
Ethnicity						
Shan	213	27.5				
Kachin	158	20.4	0.62	0.35-1.11	0.58	0.32-1.05
Burma	218	28.1	0.61	0.36-1.05	**0.56**	**0.32-0.97**
Others	186	24.0	**0.37**	**0.22-0.63**	**0.35**	**0.20-0.61**
Employment status						
Unemployed	188	24.3				
Employed	587	75.7	**0.72**	**0.43-1.20**	0.69	0.40-1.19
Sexual orientation						
Hetero-sexual	325	41.9				
Bi-/Homo-sexual	450	58.1	**1.57**	**1.07-2.29**	**1.58**	**1.06-2.33**
Place of methamphetamine first use						
House (own/drug dealer's/ friend's/sexual partner's)	218	28.1				
School/dormitory/work place	121	15.6	1.57	0.91-2.71	1.55	0.89-2.71
Entertainment venues[#]	436	56.3	**3.08**	**2.03-4.65**	**3.00**	**1.97-4.58**
Reason of methamphetamine first use						
Encouraged by friend/ sexual partner/drug dealers	308	39.7				
To lose bodyweight/for work related purpose	173	22.3	**1.61**	**1.02-2.54**	1.54	0.97-2.45
Curious about methamphetamine effects/for fun	294	38.0	**2.84**	**1.74-4.65**	**2.60**	**1.58-4.28**
Source of first time methamphetamine access						
Sexual exchanged/freely offered provided by employer	353	45.5				
Got someone to buy/bought oneself	422	54.5	**2.57**	**1.77-3.71**	**2.49**	**1.71-3.62**
Route of administration of first time use						
Inhalation	727	93.8				
Drunk/smoked/injected	48	6.2	1.18	0.56-2.48	1.13	0.53-2.42

Table 5 continues to next page

(Table 5 continued)

	N	%	Model I [a]		Model II [b]	
			AOR	95%CI	AOR	95%CI
Ever had exchanged sex for money or/and drugs						
No	241	31.1				
Yes	534	68.9			0.98	0.65-1.49
Ever diagnosed with an STI						
No	345	44.5				
Yes	430	55.5			1.15	0.77-1.72
Ever experienced suicidal ideation						
No	376	48.5				
Yes	399	51.5			0.82	0.55-1.22
Ever attempted suicide						
No	640	82.6				
Yes	135	17.4			**2.27**	**1.27-4.07**

Note. OR: odd Ratio; CI: confidence interval; AOR: adjusted odd ratio;
#(Club/karaoke/disco/restaurant/hotel/guest house/ game centers).

a Model I adjusted for age, marital status, education, ethnicity, employment status, sexual orientation, place of methamphetamine first use, reason of methamphetamine first use, source of first time methamphetamine access, and route of administration of first time use.

b Model II adjusted for age, marital status, education, ethnicity, employment status, sexual orientation, place of methamphetamine first use, reason of methamphetamine first use, source of first time methamphetamine access, route of administration of first time use, ever had exchanged sex for money or/and drugs, ever diagnosed with an STI, ever experienced suicidal ideation, and ever attempted suicide.

Table 6. Multiple logistic regression analysis of factors associated with early initiation of methamphetamine use use among female participants (N=587)

			Model I [a]		Model II [b]	
	N	%	AOR	95%CI	AOR	95%CI
Age (current age at survey)						
≤ 23	358	61.0				
> 23	229	39.0	0.85	0.52-1.39	0.85	0.51-1.41
Marital status						
Never married	383	65.2				
Ever married	204	34.8	0.97	0.63-1.48	0.96	0.62-1.49
Education						
Secondary school and below	383	65.2				
High school or above	204	34.8	1.40	0.93-2.08	1.30	0.85-1.99
Ethnicity						
Shan	203	34.6				
Kachin	116	19.8	**0.51**	**0.31-0.85**	**0.48**	**0.29-0.81**
Burma	191	32.5	0.60	0.35-1.00	0.61	0.36-1.04
Others	77	13.1	0.63	0.34-1.16	0.62	0.33-1.16
Employment status						
Unemployed	191	32.5				
Employed	396	67.5	0.71	0.47-1.07	0.65	0.42-1.02
Place of methamphetamine first use						
House (own/drug dealer's/ friend's/sexual partner's)	373	63.5				
School/dormitory/work place	39	6.7	**2.56**	**1.19-5.53**	**2.82**	**1.28-6.19**
Entertainment venues[#]	175	29.8	**4.06**	**2.67-6.17**	**4.24**	**2.77-6.50**
Reason of methamphetamine first use						
Encouraged by friend/sexual partner/drug dealers	242	41.2				
To lose bodyweight/for work related purpose	190	32.4	**1.89**	**1.21-2.93**	**1.61**	**1.02-2.53**
Curious about methamphetamine effects/for fun	155	26.4	**3.30**	**2.00-5.45**	**3.16**	**1.89-5.27**
Source of first time methamphetamine access						
Sexual exchanged/freely offered/ provided by employer	354	60.3				
Got someone to buy/bought oneself	233	39.7	1.09	0.74-1.59	1.05	0.72-1.56
Route of administration of first time use						
Inhalation	580	98.8				
Drunk/smoked/injected	7	1.2				
Ever had exchanged sex for money or/and drugs						
No	211	35.9				
Yes	376	64.1			**2.04**	**1.28-3.26**

Table 6 continues to next page

(Table 6 continued)

	N	%	Model I [a]		Model II [b]	
			AOR	95%CI	AOR	95%CI
Ever diagnosed with an STI						
No	308	52.5				
Yes	279	47.5			1.21	0.76-1.92
Ever experienced suicidal ideation						
No	243	41.4				
Yes	344	58.6			1.10	0.72-1.68
Ever attempted suicide						
No	450	76.7				
Yes	137	23.3			0.98	0.60-1.60

Note. OR: odd Ratio; I: confidence interval; AOR: adjusted odd ratio; [#](Club/karaoke/restaurant/hotel/guest house/game centers).

[a] Model I adjusted for age, marital status, education, ethnicity, employment status, place of methamphetamine first use, reason of methamphetamine first use, and source of first time methamphetamine access.

[b] Model II adjusted for age, marital status, education, ethnicity, employment status, place of methamphetamine first use, reason of methamphetamine first use, source of first time methamphetamine access, ever had exchanged sex for money or/and drugs, ever diagnosed with an STI, ever experienced suicidal ideation, and ever attempted suicide.

Figure 6 presents high-risk sexual behaviors of MA users stratified by gender. Among the participants 90.7% of males and 85.2% of females reported inconsistent condom use in the past six months whereas 94.2% of males and 47.2% of females had multiple sex partners in the past six months. Regarding a history of STI, 55.7 % of males and 56 % females had a history of STI.

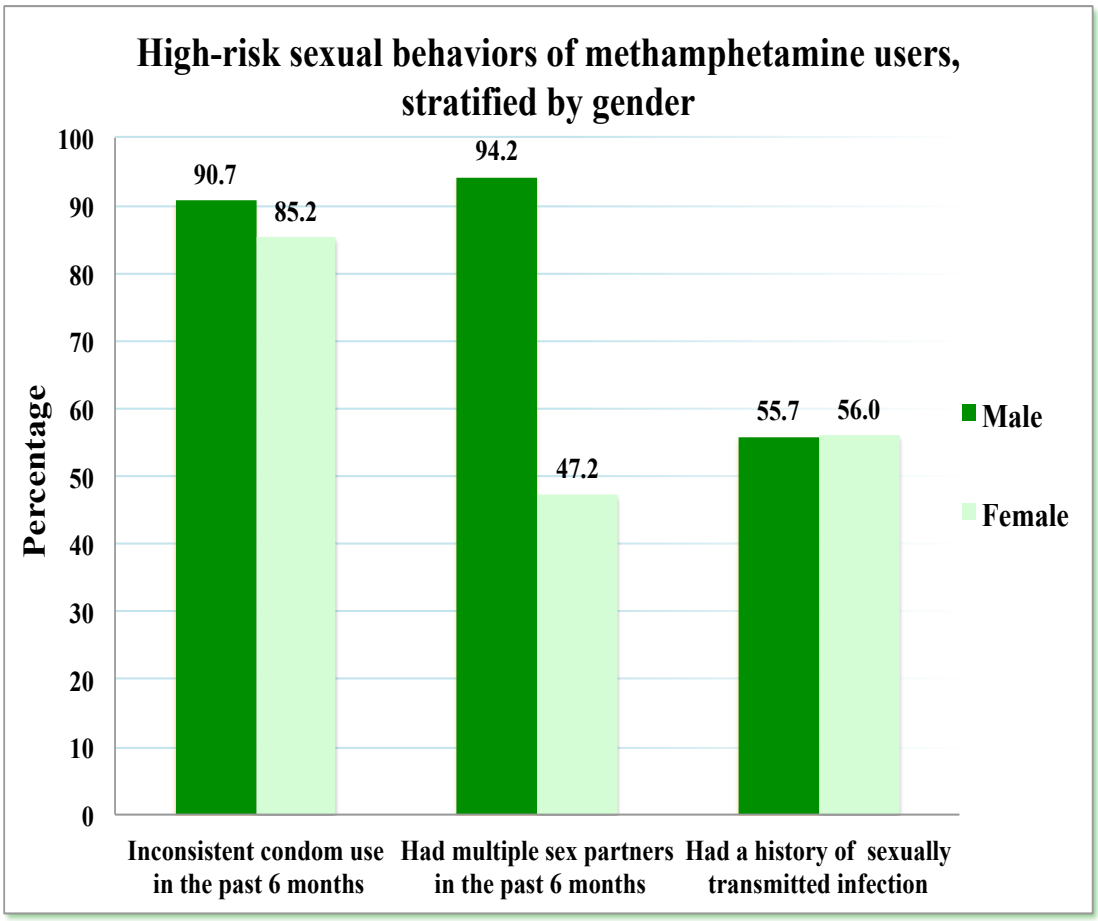


Figure 6. High-risk sexual behaviors of methamphetamine users, stratified by gender

3.8 Multiple logistic regression analyses for the association of early initiation of methamphetamine use and other factors with high-risk sexual behaviors, stratified by gender

Tables 7 and 8 present the results of three multiple logistic regression analyses of factors associated with inconsistent condom use, multiple sex partners and a history of STI stratified, by gender. Several factors were found to be associated with high-risk sexual behaviors [inconsistent use of condoms, to have had multiple sexual partners within the preceding six months, and to have an STI history] among both genders whereas the early initiation of MA was not associated with high-risk sexual behaviors.

Factors associated with inconsistent condom use

In multiple logistic regressions model of inconsistent condom use, the employed males (AOR= 0.19, 95% CI: 0.08-0.43), and females (AOR= 0.19, 95% CI: 0.07-0.51), were less likely to be inconsistent condom user. Conversely, participants who had used MA before and during sex among both males (AOR= 2.01, 95% CI: 1.04-3.87), and females (AOR= 22.29, 95% CI: 9.64-51.53), were more likely to report inconsistent condom use during past six months. In addition, male participants who had visited sex worker within six months (AOR=5.66, 95% CI: 3.07-10.45), and female, participants who used had a history of injection use of MA (AOR= 4.59, 95% CI: 1.32-15.95), were also inconsistent condom users [**Tables 7 and 8**].

Factors associated with multiple sex partners

As presented in **Table 7**, the male participants who had used MA before and during sex (AOR= 7.61, 95% CI: 3.62-16.0), were more likely to have had multiple sex partners in the past six months.

Among females, participants who had a high school or above education (AOR= 0.21, 95% CI: 0.12-0.38), and belonged to Kachin (AOR=0.41, 95% CI: 0.18-0.91), or Burma (AOR=0.33, 95% CI: 0.14-0.74) ethnic group were less likely to have had multiple sex partners in the past six months. On the other hand, being married (AOR= 1.08, 95% CI: 5.77-2.02), being employed (AOR=2.23, 95% CI: 1.19-4.17), and being a migrant (AOR= 5.02, 95% CI: 5.02, 2.44-10.34) were more likely to have had multiple sex partners. Furthermore, participants who used MA before and during sex (AOR= 5.39, 95% CI: 2.98-9.75), and who used MA more than 4 times a week (AOR= 2.71, 95% CI: 1.31-5.59), were more likely to report having multiple sex partners in the past six months [**Table 8**].

Factors associated with a history of sexually transmitted infection

As shown in **Table 7**, employed males (AOR=3.79, 95% CI: 2.39-5.99), had used more than two types of ATS (AOR=4.50, 95% CI: 2.77-7.31), and had used MA more than 4 times a week (AOR=1.93, 95% CI: 1.19-3.12), were more likely to have an STI history.

Among female participants who had a high school or above education (AOR= 0.17, 95% CI: 0.94-0.31) and belonged to Kachin (AOR=0.31, 95% CI: 0.13-0.73) or Burma (AOR=0.25, 95% CI: 0.10-0.62) ethnic group were less likely to have an STI history. Female participants who were employed (AOR=3.29, 95% CI: 1.78-6.08),

being migrant (AOR=6.47, 95% CI: 3.04-13.75), having use of MA before and during sex (AOR= 2.10, 95% CI: 2.10, 1.16-3.80), and MA use less than three times (AOR=2.12, 95% CI: 1.03-4.35) or MA use more than 4 times a week (AOR=3.40, 95% CI: 1.80-8.45), were more likely to have STI history [**Table 8**].

Table 7. Multiple logistic regression analyses for the association of early initiation of methamphetamine use and other factors with high-risk sexual behavior of male users (N=771)

	Inconsistent condom use in the past six months [a]		Had multiple sex partners in the past six months [b]		Had a history of sexually transmitted infection [c]	
	AOR	**95%CI**	**AOR**	**95%CI**	**AOR**	**95%CI**
Age (current age at survey)						
≤ 23						
> 23	1.00	0.51-1.98	1.19	0.52-2.75	**1.74**	**1.15-2.63**
Marital status						
Never married						
Ever married	0.70	0.38-1.31	S/S		1.28	0.86-1.91
Education						
Secondary school and below						
High school or above	0.70	0.40-1.25	1.27	0.60-2.67	0.91	0.64-1.29
Ethnicity						
Shan						
Kachin	0.98	0.46-2.06	0.89	0.33-2.42	1.23	0.76-1.97
Burma	1.88	0.78-4.51	1.34	0.40-4.49	1.13	0.69-1.87
Others	1.12	0.52-2.42	0.48	0.19-1.20	1.48	0.93-2.37
Employment status						
Unemployed						
Employed	**0.19**	**0.08-0.43**	1.12	0.48-2.63	**3.79**	**2.39-5.99**
Living status						
Resident						
Migrant	1.25	0.69-2.25	1.01	0.49-2.10	1.12	0.78-1.62
Age of sexual initiation						
> 17						
≤ 17	0.67	0.36-1.27	1.43	0.70-2.94	0.95	0.66-1.36
Sexual orientation						
Hetero-sexual						
Bi/Homo-sexual	1.04	0.55-1.97	1.43	0.70-2.94	1.35	0.93-1.96
Had visited sex worker within six months						
No						
Yes	**5.66**	**3.07-10.45**	2.14	0.95-4.81	1.00	0.67-1.50
Age of methamphetamine initiation						
> 17						
≤ 17	0.94	0.49-1.81	0.57	0.24-1.38	0.70	0.47-1.03
Had used methamphetamine before and during sex						
No						
Yes	**2.01**	**1.04-3.87**	**7.61**	**3.62-16.0**	1.09	0.65-1.81

Table 7 continues to next page

(Table 7 continued)

	Inconsistent condom use in the past six months [a]		Had multiple sex partners in the past six months [b]		Had a history of sexually transmitted infection [c]	
	AOR	**95%CI**	**AOR**	**95%CI**	**AOR**	**95%CI**
Frequency of methamphetamine use#						
> 3 times a month						
Once a week	1.15	0.55-2.41	0.40	0.13-1.20	1.47	0.93-2.32
> 4 times a week	1.50	0.50-2.23	0.50	0.16-1.55	1.29	0.80-2.06
≤ 4 times a week	1.51	0.67-3.40	0.48	0.15-1.52	**1.93**	**1.19-3.12**
Had used more than two types of ATS						
No						
Yes	1.37	0.64-2.95	1.15	0.47-2.82	**4.50**	**2.77-7.31**
History of injection use of methamphetamine						
No						
Yes	1.03	0.42-2.52	S/S		1.25	0.74-2.13
Had used heroin within past six months						
No						
Yes	0.91	0.38-2.17	S/S		0.83	0.491.39
Ever been to prison						
No						
Yes	S/S		S/S		0.96	0.42-2.20

Note. AOR: adjusted odd ratio; CI: confidence interval; # one participant did not response this question. S/S= Small sample size.

[a] Adjusted for age, marital status, education, ethnicity, employment status, living status, age of sexual initiation, sexual orientation, had visited sex worker within six months, age of methamphetamine initiation, had used methamphetamine before and during sex, frequency of methamphetamine use, had used more than two types of ATS, history of injection use of methamphetamine, and had used heroin within past six months.

[b] Adjusted for age, education, ethnicity, employment status, living status, age of sexual initiation, age of methamphetamine initiation, sexual orientation, had visited sex worker within six months, age of methamphetamine initiation, had used methamphetamine before and during sex, frequency of methamphetamine use, and had used more than two types of ATS.

[c] Adjusted for age, marital status, education, ethnicity, employment status, living status, age of sexual initiation, sexual orientation, had visited sex worker within six months, age of methamphetamine initiation, had used methamphetamine before and during sex, frequency of methamphetamine use, had used more than two types of ATS, history of injection use of methamphetamine, had used heroin within past six months, and ever been to prison.

Table 8. Multiple logistic regression analyses for the association of early initiation of methamphetamine use and other factors with high-risk sexual behavior of female users (N=411)

	Inconsistent condom use in the past six months [a]		Had multiple sex partners in the past six months [b]		Had a history of sexually transmitted infection [c]	
	AOR	**95%CI**	**AOR**	**95%CI**	**AOR**	**95%CI**
Age (current age at survey)						
≤ 23						
> 23	0.41	0.13-1.29	1.39	0.60-3.23	1.21	0.51-2.87
Marital status						
Never married						
Ever married	1.54	0.67-3.54	**1.08**	**5.77-2.02**	1.20	0.62-2.35
Education						
Secondary school and below						
High school or above	1.49	0.67-3.31	**0.21**	**0.12-0.38**	**0.17**	**0.94-0.31**
Ethnicity						
Shan						
Kachin	1.36	0.42-4.40	**0.41**	**0.18-0.91**	**0.31**	**0.13-0.73**
Burma	0.94	0.31-2.82	**0.33**	**0.14-0.74**	**0.25**	**0.10-0.62**
Others	2.86	0.85-9.61	0.58	0.23-1.47	0.30	0.11-8.22
Employment status						
Unemployed						
Employed	**0.19**	**0.07-0.51**	**2.23**	**1.19-4.17**	**3.29**	**1.78-6.08**
Living status						
Resident						
Migrant	1.31	0.52-3.26	**5.02**	**2.44-10.34**	**6.47**	**3.04-13.75**
Age of sexual initiation						
> 17						
≤ 17	1.20	0.58-2.49	1.01	0.60-1.71	0.97	0.56-1.68
Age of methamphetamine initiation						
> 17						
≤ 17	0.84	0.42-1.69	0.94	0.56-1.55	0.99	0.58-1.68
Had used methamphetamine before and during sex						
No						
Yes	**22.29**	**9.64-51.53**	**5.39**	**2.98-9.75**	**2.10**	**1.16-3.80**
Frequency of Methamphetamine use[#]						
> 3 times a month						
Once a week	1.37	0.52-3.66	1.87	0.92-3.82	**2.12**	**1.03-4.35**
> 4 times a week	1.39	0.47-4.13	0.76	0.35-1.65	0.59	0.27-1.27
≤ 4 times a week	1.08	0.41-2.85	**2.71**	**1.31-5.59**	**3.40**	**1.80-8.45**
History of injection use of methamphetamine						
No						
Yes	**4.59**	**1.32-15.95**	1.39	0.62-3.08	1.04	0.45-2.42

Table 8 continues to next page

(Table 8 continued)

	Inconsistent condom use in the past six months [a]		Had multiple sex partners in the past six months [b]		Had a history of sexually transmitted infection [c]	
	AOR	**95%CI**	**AOR**	**95%CI**	**AOR**	**95%CI**
Had used heroin within past six months						
No						
Yes	0.86	0.37-1.98	1.10	0.59-2.03	1.41	0.74-2.70
Ever been to prison						
No						
Yes	S/S		0.44	0.12-1.63	0.42	0.10-1.67

Note. AOR: adjusted odd ratio; CI: confidence interval;[#]one participant did not response this question. S/S= Small sample size.

[a] Adjusted for age, marital status, education, ethnicity, employment status, living status, age of sexual initiation, age of methamphetamine initiation, had used methamphetamine before and during sex, frequency of methamphetamine use, history of injection use of methamphetamine, and had used heroin within past six months.

[b] Adjusted for age, marital status, education, ethnicity, employment status, living status, age of sexual initiation, age of methamphetamine initiation, had used methamphetamine before and during sex, frequency of methamphetamine use, history of injection use of methamphetamine, and had used heroin within past six months, and ever been to prison.

[c] Adjusted for age, marital status, education, ethnicity, employment status, living status, age of sexual initiation, age of methamphetamine initiation, had used methamphetamine before and during sex, frequency of methamphetamine use, history of injection use of methamphetamine, and had used heroin within past six months, and ever been to prison.

3.9 Generalized estimating equation analyses to predict high-risk sexual behaviors among methamphetamine users, stratified by gender

Tables 9 show adjusted odds ratio estimates based on GEE logistic regressions for males and females. For both males and females, analyses were conducted separately to examine factors associated with high-risk sexual behaviors [inconsistent use of condoms, to have had multiple sexual partners within the preceding six months, and to have an STI history among MA users [**Table 9**].

Factors associated with high-risk sexual behaviors among male users

The finding revealed that employed males (AOR=1.42; 95% CI=1.08-1.87), and male MA users who used MA before and during sex (AOR=1.67; 95% CI=1.23-2.28), were more likely to use condoms inconsistently, to have had multiple sexual partners within the preceding six months, and to have an STI history (for all 3 high-risk sexual behaviors; **Table 9**). Compared to the male participants who did not visit sex workers in the past six months, those who visited sex workers in the past six months were more likely to engage in high-risk sexual behaviors (AOR=1.41, 95% CI: 1.08-1.83). In addition, male MA users who used more than two types of ATS (AOR=1.77; 95% CI=1.30-2.41) were more likely to be involved in high-risk sexual behavior.

No statistically significant associations were found between high-risk sexual behavior and age of participants, marital status, education, ethnicity, living status, age of sexual and MA initiation, history of injection MA use, use of heroin within the last six months, and having ever been to prison among male MA users [**Table 9**].

Factors associated with high-risk sexual behaviors among female users

Table 9 shows the factors associated with high-risk sexual behaviors among female participants. The female participants who had high school or higher level of education (AOR= 0.42, 95% CI: 0.31-0.56) were less likely to engage in high-risk sexual behaviors (inconsistent use of condoms, to have had multiple sexual partners within the preceding six months, and to have an STI history) compared to the female participants with secondary or below level of education. The employed female participants were more likely to engage in high-risk sexual behaviors compared to their counterparts who were not employed (AOR=1.57; 95% CI=1.13-2.18).

Moreover, participants who migrated from other part of Myanmar (AOR=2.70; 95% CI=1.86-3.39) were more likely to engage in high-risk sexual behaviors compared to non-migrant female participants. Furthermore, the female participants who had used MA before and during sex (AOR=3.39, 95% CI: 2.51-4.56) and who used MA once a week (AOR=2.06, 1.41-3.02) or more than four times a week (AOR=2.44, 95% CI: 1.66-3.60) were more likely to engage in high-risk sexual behaviors. Age of MA and sexual initiation, marital status, ethnicity, history of injection MA use, use of heroin within the last six months, and having ever been to prison were not correlated to high-risk sexual behaviors among male MA users [**Table 9**].

Table 9 Generalized estimating equations for the association of early initiation of methamphetamine use and other factors with high-risk sexual behaviors of methamphetamine users by gender

	Male (N=771) [a]				Female (N=411) [b]			
	N	%	AOR	95%CI	N	%	AOR	95%CI
Age (current age at survey)								
≤ 23	435	56.4			260	63.3		
> 23	336	43.6	1.28	0.96-1.70	151	36.7	1.15	0.79-1.68
Marital status								
Never married	549	71.2			277	67.4		
Ever married	222	28.8	1.26	0.95-1.67	134	32.6	1.10	0.78-1.54
Education								
Secondary school and below	357	46.3			259	63.0		
High school or above	414	53.7	0.98	0.77-1.24	152	37.0	**0.42**	**0.31-0.56**
Ethnicity								
Shan	212	27.5			149	36.3		
Kachin	158	20.5	1.17	0.85-1.60	72	17.5	0.72	0.43-1.19
Burma	215	27.9	1.07	0.78-1.49	139	33.8	1.24	0.75-2.05
Others	186	24.1	0.91	0.65-1.29	51	12.4	1.48	0.95-2.31
Employment status								
Unemployed	188	24.4			158	38.4		
Employed	583	75.6	**1.42**	**1.08-1.87**	253	61.6	**1.57**	**1.13-2.18**
Living status								
Resident	336	43.6			124	30.2		
Migrant	435	56.4	1.13	0.89-1.45	287	69.8	**2.70**	**1.86-3.93**
Age of sexual initiation								
> 17	226	29.3			221	53.8		
≤ 17	545	70.7	0.95	0.74-1.21	190	46.2	1.02	0.77-1.34
Sexual orientation								
Hetero-sexual	327	42.4						
Bi/Homo-sexual	444	57.6	1.15	0.89-1.48	S/S			
Had visited sex worker within six months								
No	220	28.5						
Yes	551	71.5	**1.41**	**1.08-1.83**	S/S			
Age of methamphetamine initiation								
> 17	208	27.0			177	43.1		
≤ 17	563	73.0	0.85	0.65-1.12	234	56.9	0.95	0.73-1.24
Had used methamphetamine before and during sex								
No	96	12.5			130	31.6		
Yes	675	87.5	**1.67**	**1.23-2.28**	281	68.4	**3.39**	**2.51-4.56**

Table 9 continues to next page

(Table 9 continued)

	Male (N=771) [a]				Female (N=411) [b]			
	N	%	AOR	95%CI	N	%	AOR	95%CI
Frequency of methamphetamine use[#]								
> 3 times a month	160	20.8			98	23.9		
Once a week	223	28.9	1.31	0.95-1.81	101	24.6	**2.06**	**1.41-3.02**
> 4 times a week	193	25.0	1.23	0.91-1.67	83	20.2	1.37	0.95-1.99
≤ 4 times a week	195	25.3	1.29	0.95-1.77	128	31.3	**2.44**	**1.66-3.60**
Had used more than two types of ATS								
No	591	12.5			409	99.5		
Yes	180	87.5	**1.77**	**1.30-2.41**	2	0.5		
History of injection use of methamphetamine								
No	647	83.9			345	83.9		
Yes	124	16.1	1.12	0.76-1.64	66	16.1	1.40	0.90-2.20
Had used heroin within past six months								
No	638	82.7			295	71.8		
Yes	133	17.3	1.01	0.70-1.45	116	28.2	1.10	0.78-1.55
Ever been to prison								
No	741	96.1			397	96.6		
Yes	30	3.9	0.93	0.52-1.69	14	3.4	0.54	0.27-1.07

Note. AOR: adjusted odd ratio; CI: confidence interval.; [#]One female participant did not response this question. S/S= Small sample size.

[a] Adjusted for age, marital status, education, ethnicity, employment status, living status, age of sexual initiation, sexual orientation, had visited sex worker within six months, age of methamphetamine initiation, had used methamphetamine before and during sex, frequency of methamphetamine use, had used more than 2 types of ATS, history of injection use of methamphetamine, had used heroin within past six months, and ever been to prison.

[b] Adjusted for age, marital status, education, ethnicity, employment status, living status, age of sexual initiation, age of methamphetamine initiation, had used methamphetamine before and during sex, frequency of methamphetamine use, history of injection use of methamphetamine, had used heroin within past six months, and ever been to prison.

4. Discussion

The current study provides an extensive description, and highlights several potential risk factors for, the early age at MA initiation and the high-risk sexual behaviors of MA users in Muse, Myanmar where an HIV and methamphetamine epidemic is occurring. In this study, the high rate of early initiation of MA was observed among males and females. Male were more likely to initiate early than females. The early initiation of MA use was associated with the first time MA use at entertainment venues, and the reason of the first time MA use was to lose body weight or for work related purposes. GEE revealed that high-risk sexual behaviors (inconsistent condom use and having multiple sexual partners in the preceding six months and having a history of STI) were associated with MA use before or during sex among both male and female users. High-risk sexual behaviors were associated with the use of more than two types of MA among males while levels of education were associated with high-risk sexual behaviors among females. To the best of my knowledge, this is the first study to examine the age at initiation of MA and the high-risk sexual behaviors of MA in Myanmar.

4.1 The early initiation of methamphetamine use

More than half of males (73.0%) and females (60.5%) initiated MA before high school. Such a high proportion of early MA use initiation is a concern, when considering its potential association with a range of adverse health problems later in life [85, 86]. This study also demonstrated that males are more likely to initiate use earlier than females. This findings is consistent with previous studies from the United States [170, 171], but it contradicts with other studies from Taiwan [91] and the United States [172]. There

are possible reasons are stated for such lower proportion of earlier initiation for females as compared with male. The first explanation is that female users are more likely to be stigmatized by society than male users [25], due to drug use being a violation of social norms of behavior, and many people consider that drug use by females is even worse [118, 173]. Second explanation is that MA use may relate to the working environment. Since our study area is near a Chinese border city, males are usually engaged in jobs during their early adolescence and thereby have usually more chance to be exposed to MA through their working places. This was supported by one study, which concluded that males are more likely to have opportunity to use drug compared to females [174].

For both males and females, the factors associated with early initiation of MA use were place of the first time MA use and reason of the first time MA use in the multiple logistic regressions model I and II. Similar findings were observed in the multivariate Cox regression analysis; age of MA initiation was associated with place of the first time MA use and reason of the first time MA use. Among male MA users, those who asked someone to buy MA for them or bought the MA by themselves for first time use, those who had bi/homo-sexual preferences and those who indicated having ever attempted suicide had a higher likelihood of reporting early age of MA initiation. Furthermore, male MA users who were in older age group and who were employed at the time of survey had a lower likelihood of reporting early initiation of MA use. Among female MA users, exchanging sex for money and/or drugs were associated with initiation at an early age. On the other hand, female participants who belonged to Kachin ethnic group were less likely to initiate MA in early age compared to Shan ethnic group.

Notably, using MA at entertainment venues such as bars, clubs, restaurants, karaoke, and game centers were found to be a potential risk factor for early initiation of

MA use for both genders in the multiple logistic regressions model I and II. Likewise, the multivariate Cox regression analysis revealed that age of MA initiation was associated with entertainment venues for both males and females. This association may be because entertainment venues such as bars, clubs, restaurant, motel, karaoke, and game centers provides a good venue for dealers to sell drugs and that drug users also find it easy to access for MA and other illicit drugs [175, 176]. Furthermore, MA is regarded as a "club or party drug" in the West [154, 176-178]. The same trend is occurring in Asia as well, and hence the reason why it makes sense that MA is sold in venues where young people visit to enjoy themselves for entertainment purposes. While, most of the previous studies, found that visiting an entertainment venue is often associated with drinking and smoking, and other illegal substances such as cocaine, and marijuana [179, 180], this is the first study, which found that entertainment venue is one of the important factors for early initiation of MA. Study findings highlight the need for more nuanced examinations of the club drug phenomenon and to understand the complex relationships between such elements of social identity so as to better inform prevention, education, and treatment efforts.

In this study, early initiation of MA use was associated with the reason of MA first use for weight loss or work related purposes and curiosity or fun among both males and females in the multiple logistic regressions model I and II. Correspondingly, age of MA initiation was associated with the reason of MA first use for weight loss or work related purposes and curiosity or fun among both genders in the multivariate Cox regression analysis. Females tend to initiate drugs use to help them lose body weight while males initiated it for fun or curiosity about drug effects [32, 94, 181, 182]. The present results are consistent with such phenomenon. MA users dramatically lose weight while using this drug for a substantial period of time, due to loss of appetite

[111, 170, 183]. However, weight can quickly return following the cessation of MA. That may make it harder for the MA users to stop, resulting in the development of dependence to MA [184]. The lack of knowledge and limited understanding of MA abuse poses adverse health outcomes in their adulthood [185]. Furthermore, MA initiation was associated with work related purposes for both males and females. In Asia, MA is also often used for recreational and work-related purposes [125, 186] among certain populations such as FSWs, MSM and highway drivers [53, 187].

Male users who had ever attempted suicide were more likely to initiate MA in their earlier age in the multiple logistic regressions model II. However, such association was not found among female MA users. This may be because early initiation of substance and the risk factors of suicide differed by gender [188-190]. In the United States, hard drug use in early age was associated with suicide ideation among males while early initiation of tobacco use for females [189]. French and American youth also reported that early initiation of substances such as alcohol, cannabis and marijuana were positively associated with suicide attempts [191].

HIV risk-taking behaviors were associated with the age of early initiation. For example, among females MA users, exchanging sex for money or/and drugs was associated with early age of MA initiation in the multiple logistic regressions model II. The exchange of sex for money and/or drugs may be a means to survival. This association is likely because other factors associated with initiation of drug use are homelessness or being a runaway [192, 193]. It can also be a mean to quench the MA addiction [192, 193]. Associations between MA initiation and risky sexual behaviors have an important implication for the fight against HIV/AIDS and other STIs. Thus, it is important to understand the factors associated with high-risk sexual behaviors in order to plan tailored and effective interventions. Knowledge of MA related harm is

often low in the general population due to a limited understanding or awareness of drugs [185]. Health education programs may thus be particularly important among adolescents who belong to vulnerable groups.

4.2 High-risk sexual behaviors of methamphetamine users

The findings revealed that a large proportion of MA users engaged in high-risk sexual behaviors (inconsistent condom use: males: 90.7%, females: 85.2%; had multiple sexual partner: males: 94.2%, females: 47.2%; and had history of STI: males: 55.7%, females: 56%). This high rate illustrates the alarming extent to which majority of MA users are engaged in sexual risk-taking behaviors. The findings show that both males and females who used MA before and during sex and who were employed at the time of survey were more likely to use condoms inconsistently, to have had multiple sexual partners within the preceding six months, and to have an STI history. Among male users, those who used more than two types of ATS and those who visited sex workers within six months were more likely to be involved in high-risk sexual behaviors for all three high-risk sexual behaviors. Among female users, those who had an education level of high school or above were less likely than women with a secondary or below level of education to use condoms inconsistently, to have had multiple sexual partners within the preceding six months, and to have an STI history. Female MA users who were migrant, who used MA more than or equal to four times per week and who used MA once a week were more likely to be involved in high-risk sexual behavior.

For both males and females who used MA before and during sexual intercourse, there was a greater likelihood of inconsistent condom use, had multiple sexual partners within the preceding six months, and had an STI history (high-risk sexual behaviors).

MA use causes loss of inhibitory control leading to sexually compulsive behavior, and can also cloud judgment [61, 65]. Therefore, its use before or during sexual intercourse may lead to sexual intercourse without condom use and other risky sexual behaviors [58-61, 65]. MA use before and during sexual activities has been shown as one of the significant risk factors for decreasing use of condoms during vaginal and anal intercourse among IDUs, MSM, and FSWs [18, 194]. In this study, MA use before and during sexual activities were associated with inconsistent condom use, having multiple sexual partners within the preceding six months, and have an STI history. Thus, the use of MA before or during intercourse may further escalate the STI and HIV epidemic [62, 121, 122].

In this study, female MA users who used MA more than four times a week, and who used MA once a week were more likely to be involved in high-risk sexual behavior. MA is an extremely addictive drug and long-term use can result in sexual health problems such as STIs and HIV [12, 52, 53]. This kind of heavy and regular use of MAs can lead to failure to control high-risk sexual behaviors such as unprotected sexual intercourse, and prolongs sexual activities thus increasing the risk of HIV and STIs [60, 195]. This may be due to the fact that the use of MA increases sexual desire, arousal, and pleasure [58, 181]. These findings are also in line with previous observations, which have shown that heavier or greater frequency of drug use has a multitude of biological and cognitive effects that may increase sexual risk-taking behaviors [196]. Furthermore, a review study found that drug users who engage in more high-risk sexual behaviors tend to be heavier drug-users than those who engage in less high-risk sexual behaviors [197].

Among other factors than those related to MA use, being employed was positively associated with high-risk sexual behaviors among both male and female MA

users. One possible explanation is that individuals who have jobs might have more opportunities to engage in dyadic relations through their professional and personal lives [198, 199]. Similar results were reported from Thailand [200], which showed that paid workers were more likely to use addictive substances and to be engaged in sexual risk-taking behaviors. A study in Bangladesh also found that paid female jobholders had a greater tendency to engage in sexual risk-taking behaviors [201].

Male participants who visited sex worker within past six months were more likely to engage in high-risk behaviors. This may be because male participants who had visited sex worker may use MA to enhance their sexual activities [196, 197, 202]. In the United States, MA users visited sex workers more often than non-MA users, and engaged in unprotected sex [18]. An increasing body of evidence also shows that the association between drug use and high-risk sexual behavior is particularly pronounced among MA male users [196, 197, 202]. Evidence from different parts of the world shows that homosexual MA drug users have also lower rates of condom use, higher rates of unprotected anal intercourse, prolonged sexual activity, and multiple and casual sexual partners compared to their heterosexual counterparts [18, 203]. Furthermore, they are also more likely to suffer from HIV and other STIs [204, 205].

The use of more than two types of ATS was positively associated with high-risk behaviors among male MA users. The association between poly-drug use (use of more than two different types of drug) and high-risk sexual behaviors is particularly pronounced among youth and adult populations [160, 161, 206]. Different from other illicit drugs, MA encourages its users to engage in prolonged sexual activities, and that leads to higher rates of unprotected anal intercourse [18, 203, 207]. Ultimately, it may lead to greater risk for HIV and other STIs [204, 205]. MA intervention program needs to pay particular attention to people who used more than two types of drugs.

A high education level among female MA users was negatively associated with high-risk sexual behaviors. The probability of report of the high-risk sexual behaviors decreased with increasing educational level in GEE analyses. Similar findings were reported for Kenyan females, with each increase in education level associated with an increased report of use of condoms with their last partner [208]. However, past STI diagnosis was negatively associated with a junior high school education compared to a primary or lower level education among Chinese FSWs [209]. Nevertheless, the findings of the current study are supported by research done elsewhere [210], and suggests that prevention programs should pay greater attention to less educated female MA users in order to reduce high-risk sexual behavior.

Migrants have been considered a high-risk population for acquiring and transmitting STIs, including HIV, in both developing and developed countries [211-213]. Notably, migrant females were more likely to engage in high-risk sexual behaviors compared to non-migrant users. This association did not reach a statistically significant level among male migrant MA users. Several reasons may account for these differences in association. First, in this study, one of the risk behavior measurements was having had a history of an STI, and females have a higher biological susceptibility to be infected by STIs and HIV through sexual activities than males [102, 105]. For example, females were estimated to have a two to four times higher chance to get HIV through unprotected vaginal sex with HIV infected partner than males [102]. Second, an imbalance of power in a relationship and socioeconomically dependency on males may impair females' decision-making about condom use [103, 214, 215]. These factors may further increase the risk of contracting an STI among migrant drug users. Third, the working environment may also put female migrants to increase use of MA at work place. The study area of Muse is located near the Chinese border, and female migrants

often work at the nightclubs and bars in this location. This kind of work requires them to stay awake for the whole night and therefore increase their vulnerability to sexual violence, risky sexual behaviors, and subsequent STI transmission [216, 217]. MA prevention programs are thus urgently needed among migrant female MA users in the border areas of Myanmar and other places with similar characteristics.

4.3 Limitations and strengths

This study provides several important findings and insights. The findings should be interpreted carefully owing to its limitations. First, all the data were based on participants' self-reported answers to a questionnaire. There is a possibility of recall bias in the reported ages of the first MA use and partner specific condom use behaviors. However, people may remember their age at first drug use and related behaviors better than more ordinary occasions [218]. Furthermore, to minimize the recall bias for condom use behaviors, the study inquired about partner-specific information, including partner type and condom use for each sexual episode.

Second, the use of self-reported sexual behaviors may be vulnerable to social desirability and recall bias [219-221]. However, to minimize the effects of this limitation, several strategies were undertaken. For example, training was provided to the interview assistants on specific manners, the instruments used were previously evaluated, privacy was ensured, and CASI was used during interview for administration of the survey [167, 222]. Furthermore, previous studies have reported that drug users' self-reports are adequately valid and acceptable for this type of research [223, 224], thus supporting this study observation based on self-reported risk behaviors.

The third limitation is that high-risk sexual behaviors were assessed using two direct measures (inconsistent condom use and multiple sexual partners in the preceding six months) and one indirect measure (STI infection history). The variables for inconsistent condom use and multiple sexual partners in the preceding six months were dichotomized as consistent versus inconsistent and single partner versus had more than two partners. The participants whose condom use frequency was high but still less than entirely consistent and those who had multiple sex partners but used condoms consistently were simply counted as showing inconsistent condom use and having multiple sex partners. This was due to the study not being able to fully explore these subtle differences in condom use frequency and consistent condom use with multiple sex partners. Therefore, the findings presented here may underestimate the association between these patterns of behavior and the various independent variables examined.

Fourth, the cross-sectional study does not allow us to evaluate the direction of causality of the reported associations. Future longitudinal research is needed to untangle these issues.

Finally, although the sample size is large, this study was conducted only in one area of Myanmar. The drug users' behaviors and characteristics that are reported in this study may not be similar to drug users from other parts of Myanmar. Also, there are many geographical, economic and political differences among Southeast Asian countries. Therefore, these findings in this study cannot be applied to other Southeast Asia region. Furthermore, this study only recruited current drug users. It is possible that MA use characteristics and behaviors may have differed from MA users who quitted MA recently and before the survey. Moreover, because study sample, which was not randomly selected, may have limited the generalizability of the results. Therefore, above limitations should be considered when interpreting the study results.

Despite such limitations, this study has unique characteristics and the findings have important implications for understanding the risk factors of MA initiation, and the high-risk sexual behaviors of MA users. To my knowledge, this is the first study to be undertaken in a developing country in the Southeast Asia region with a large sample. In this context, the findings of this study may also provide better insights into this relationship in the context of Southeast Asian region.

As mentioned as above, this study recruited a relatively large number of the general MA using population in the community (both male and female MA users). Most of the available literatures on MA use and abuse has been conducted on MA users in drug dependence treatment centers and who had been arrested, and together with small sample sizes and such research have limited applicability [225-227].

Notably, this study recruited current MA users using RDS sampling method and also utilized the CASI technique. These methods and techniques increase recruitment of hidden populations and response to questions about stigmatized behaviors. RDS sampling is a variant of chain-referral sampling that helps to recruit marginalized populations [84, 131-135]. CASI is a self-administered computer program that uses private places to collect data [166, 167]. It improves the quality of data collection concerning with socially sensitive and undesirable activities, particularly among marginalized populations [165-167]. For example, compared with face-to-face interview CASI showed more frequent disclosure of socially undesirable attitudes [222, 228] and stigmatized behaviors [229].

5. Conclusions and recommendations

The current study contributes valuable information about the age of initiation of MA use, high-risk sexual behaviors of MA users, and the risk factors surrounding these behaviors by gender. The findings reveal that more than half of male and female users started using MA before 18 years old. With regard to high-risk sexual behaviors, 90.7% of males and 85.2% of females reported inconsistent condom use within the preceding six months, while the percentages of having multiple sex partners within the preceding six months were 94.2 % among males and 47.2% among females, respectively. On the other hand, 55.7% of males and 56.0 % of females reported having a history of STI.

Factors associated with early initiation of MA use included the first-time use of MA being in an entertainment venue, and the reason for first time use being to help with body weight loss or for work-related purposes. Male participants who had a history of suicidal ideation or behaviors were more likely to initiate MA at an early age. Among females, exchange of sex for money or drugs was associated with an early age initiation for MA use.

Both males and females who used MA before and during sex were more likely to engage in high-risk sexual behaviors. For male MA users, using more than two types of ATS were significant predictors of high-risk sexual behaviors. For female MA users, being a migrant and not having high school or higher levels of education were risk factors for high-risk sexual behaviors.

Comprehensive and targeted MA prevention strategies and programs that reflect gender considerations should give more attention to employed MA users and vulnerable populations such as migrants, clients of sex workers, and those who exchange sex for money and/or drugs. Such programs should also consider

entertainment venues as priority places for preventing MA initiation. Simultaneously, such programs should also promote MA awareness and knowledge about the effects of MA, and should also address the early initiation of MA and high-risk sexual behaviors. Health education programs on MA misuse and awareness that address early age of MA initiation and high-risk sexual behaviors are urgently needed in Myanmar. For example, school-based drug education programs were found to be effective in preventing the early initiation of drug use [230-232]. In this study, more than 60% of both males and females initiated MA before their 18th birthday, the age at which most young people graduate from high school. Thus, school-based drug education programs may be useful in preventing early initiation of MA use.

However, school-based drug education programs are particularly focused on consequences of drug abuse and drug effects on sexual behaviors are not well addressed in these programs [233]. Further school-based drug education programs may need to reflect the effects of drugs abuse on sexual behaviors as part of the program. Such educational program should also involve parents or caregivers, families, teachers, communities, and policy makers to discourage young people from experimenting with MA use at all [231, 234]. The government should also properly monitor various entertainment venues such as clubs, karaoke, and game center where individual can play video and Internet games. In order for this to happen, continued investment is vital for legislation, policies, law enforcement, research, training, establishment and expansion of treatment and rehabilitation centers.

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Appendices

Appendix 1: Map of study area

Appendix 2: Information sheet for participants (English)

Request for your cooperation on this research

Dear Participants,

The object of this study is to examine the gender difference in initiation into amphetamine-type of stimulant (ATS) drug and alcohol use. In this research, we would like to collect information regarding your ATS and alcohol use history, sexual behaviors, your HIV/AIDS knowledge. We do not ask your name in this study. So, your identity will not be disclosed.

If you agree with the study, we would like to conduct an interview. We will ask you some personal questions about your ATS and alcohol use history, your sexual behavior and HIV/AIDS knowledge. The interview will take about 30-40 minutes. All the information we obtain will remain strictly confidential and your answer will be never be identified. What we learn from you will help us determine what preventive measures could be established, in order to decrease ATS and alcohol use behavior among youth.

This study is approved by the ethical committee of the University of Tokyo and Ethical Review Committee, Defence Services Medical Research Centre, Naypyidaw, Myanmar.

All the participants will be received primary incentives for their own interview. The participants will be eligible to receive the secondary incentives after the expiry period

of their recruitment coupons, or if all of three recruits have already come to participate. You may ask any questions about the study at this time. If you are sure that you have understood what will be required for you and are willing to participate in this study, please sign on the next sheet.

Thank you very much for your kind cooperation.

If you have any questions, you can feel free to contact:

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Appendix 3: Information sheet for participants (Myanmar)

သုတေသနလုပ်ငန်းတွင် ပါဝင်ပူးပေါင်းဆောင်ရွက်ရန် မေတ္တာရပ်ခံချက်

မိတ်ဆွေများသို့

ဤကျန်းမာရေး သုတေသန မေးခွန်းလွှာ၏ ရည်ရွယ်ချက်မှာ အမျိုးသား နှင့် အမျိုးသမီး တို့ စိတ်ကြွ ဆေး နှင့် အရက် စတင်သုံးစွဲသော အသက် ခြားနားမှုကို လေ့လာရန် ဖြစ်ပါသည်။ ဤ သုတေသန သည် တိုကျို တက္ကသိုလ် မှ အပြည်ပြည်ဆိုင်ရာ ကျန်းမာရေး ဘာသာရပ်ကျောင်းသူ မစောယုမွန်၏ ပါရဂူ ဘွဲ့ယူစာတမ်း အတွက် ဖြစ်ပါသည်။

မေးခွန်းလွှာတွင် ကျွန်ုပ်တို့သည် သင်၏ စိတ် ကြွ ဆေး နှင့် အရက် စတင်သုံးစွဲသော သမိုင်းကြောင်း၊ လိင်ဆက်ဆံခြင်း ဆိုင်ရာ အပြု အမူများ၊ ခုခံအားကျဆင်းမှုဆိုင်ရာ အကြောင်းအရာ နှင့် ပတ်သက်သော ဗဟုသုတ နှင့်ပုဂ္ဂိုလ် ရေးဆိုင်ရာ အချက်အလက် များကို ကောက်ယူချင်ပါသည်။ ကျွန်တော်တို့ အတွက် စိတ်ကြွဆေးနှင့် အရက် သုံးစွဲ မှု ပတ်သက်သော အကြောင်းကိစ္စ များကိုပိုမို သိရှိနားလည် အောင်အကူအညီပေးမည်ဟု မျှော်လင့်ပါ သည်။ ကျွန်တော်၊ ကျွန်မ တို့ အနေ ဖြင့် ဖြေကြားသူ ၏ အမည် နှင့် နေရပ်လိပ်စာ ကို မေးမြန်းမှတ်သား ခြင်းပြုလုပ်မည် မဟုတ်ပါ။ ဖြေကြားချက်အားလုံးကို လုံခြုံစွာ ထိန်းသိမ်းထားမည်ဖြစ်ပြီး လျှို့ဝှက်ချက် အားလုံး ကို နှုတ်လုံအောင် စောင့်စည်း မည်ဖြစ် ကြောင်း အာမခံ ပါသည်။

ဤသုတေသနပြုခြင်းကို သဘောတူလျှင် သင့်အား ကျွန်ုပ် တို့တွေ့ဆုံမေးမြန်းလိုပါသည်။ ကျွန်တော်၊ကျွန်မ တို့မေးမြန်းမည့်မေးခွန်းများသည် ကိုယ်ရေး ကိုယ်တာ နှင့် ဆိုင်သော မေးခွန်းများဖြစ်ပြီး အချို့ သောသူများ အတွက်ဖြေကြားရန် ခက်ခဲ ပါလိမ့်မည်။ သို့သော် မိတ်ဆွေ၏ ဖြေကြားချက် အားလုံးကို လျှို့ဝှက်ချက် အဖြစ်လုံခြုံစွာ ထိန်းသိမ်းခြင်းနှင့် နှုတ်လုံအောင် စောင့်စည်း မည်ဖြစ်ကြောင်း လုံးဝ အာမခံ ပါသည်။ မိတ်ဆွေအနေ နှင့် မဖြေကြားလိုသော မေးခွန်းများအတွက် မဖြေပဲ နေနိုင်ပါ သည်။ အချိန်မရွေး ဖြေကြားခြင်း ကို ရပ်ဆိုင်းအပြီးသတ်နိုင်ပါသည်။ ယခုလို ဆန်းစစ်လွှာကို တုံ့ပြန်ဖြေကြား ကူညီပေးခြင်း ကို အထူးကျေးဇူး တင်ရှိပါကြောင်း ပြောကြား လိုပါသည်။ ဤ မေးမြန်းဖြေ ကြား ခြင်း သည် အချိန်အားဖြင့်(၃၀ မှ ၄၀) မိနစ် ခန့် သာကြာ မည်ဖြစ်ပါသည်။ မိတ်ဆွေ အနေဖြင့် သဘော တူညီပါသလား။

သင့်ထံမှ ကျွန်ုပ် တို့ရရှိသော အကြောင်းအရာ အချက်အလက်များသည် လူငယ်များကြား စိတ်ကြွဆေးနှင့် အရက် သုံးစွဲ မှု ဆိုင်ရာ အမူအကျင့်များ ကို လျော့ချ နိုင်ရန် စီမံချက်များ ရေးဆွဲ ဆုံးဖြတ် နိုင်ရန် စီမံချက် များရေးဆွဲ ဆုံးဖြတ်နိုင်ရန် လည်း အကူအညီများစွာ ပေးပါလိမ့်မည်။

သုတေသန ကို တိုကျို တက္ကသိုလ်၏ သုတေသန ကျင့်ဝတ်သိက္ခာ ဆိုင်ရာ ကော်မတီ နှင့် တပ်မတော် ဆေးသုတေသန ဌာနတို့၏ ခွင့်ပြုမိန့် ရရှိပြီး ဖြစ်ပါသည်။

ဤသုတေသန တွင်ပါဝင် ပူးပေါင်းဆောင်ရွက်သူ အားလုံးသည် သူတို့ပါဝင်သည့် တွေ့ဆုံ မေးမြန်းမှု အတွက်အတွက် အထောက်အပံ့အချို့ ရရှိပါသည်။ ထို့အပြင် သင်သည် သင်၏ စိတ်ကြွဆေး သုံးစွဲဖက် သူငယ်ချင်း ကိုတွေ့ဆုံ မေးမြန်း နိုင်ရန် စည်းရုံးလှုံ့ဆော်ပေး လျှင် နောက်ထပ် အထောက်အပံ့ အနဲ ငယ်ခံစား ခွင့်ထပ်မံ ရရှိမည် ဖြစ်မည်။

ဤသုတေသန နှင့် ပတ်သက်၍ မရှင်းလင်းသည် များကို မေးမြန်းလိုပါက ယခုမေးမြန်းနိုင်ပါသည်။ ဤ သုတေသန တွင်သင်သည် ပူးပေါင်းပါဝင်ဆောင်ရွက်လိုပြီး လုပ်ဆောင်ရန် လိုအပ်သည်များ ကို ရှင်းရှင်း လင်းလင်း သိနားလည်ပြီ ဟု ယူဆသေချာပြီဆိုပါက နောက်စာမျက်နှာ တွင် ကျေးဇူးပြု၍ လက်မှတ်ရေးထိုးပါ။

သင့်ရဲ့ ပူးပေါင်းပါဝင်မှုကို ကျေးဇူးအထူးတင် ရှိပါသည်။ မရှင်းလင်းသည် များရှိပါက လည်းအောက်ပါလိပ်စာတွင် လွတ်လပ်စွာ ဆက်သွယ် မေးမြန်းနိုင်ပါသည်။

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Appendix 4: Informed consent form for participants (Myanmar)

Informed Consent Form for Participants

To: The Commanding Officer
Ethical Review Committee
Defence Services Medical Research Centre

Study title: "**Gender difference in initiation into amphetamine-type of stimulant use in Muse, Myanmar**"

Principle investigator: **Saw Yu Mon**

I _____, after reading having been explained to me the consents of this study, understand what is expected of me as a participant in this study.

I understand:

1. The purpose of the procedure of the study
2. The consent of the questionnaire
3. That will not be placed under any harm of discomfort
4. That I may refuse to answer any question if I don't want to answer
5. That I can withdraw from the study at any time (during or after study) without any

harm

6. That any information I provide will be strictly treated in a confidential manner and that I will not be identified in the reporting of the result

Signature of the participant who gave consent

Date:

I,_____, certify that I have explained to the participant the consent and procedure of the study according to the attached information page. I have covered all I will protect the confidentially of the participants.

Name of researcher Signature of researcher

Date:

Appendix 5: Informed consent form for participants (Myanmar)

သုတေသနလုပ်ငန်း တွင် ပါဝင် ရန် သဘော တူလွှာ

သို့

တပ်မှူးကြီး၊ တပ်မတော်ဆေးသုတေသနတပ်။

လေ့လာမှု ခေါင်းစဉ်။ ။အမျိုးသား နှင့် အမျိုးသမီး တို့ စိတ်ကြွ ဆေး နှင့် အရက် စတင်သုံးစွဲသော အသက် ခြားနားမှုကို လေ့လာခြင်း။

အဓိကဆွေးနွေးတွေ့ဆုံမေးမြန်းသူ ---- မစောယုမွန်

ကျွန်တော် ---------- သည် အထက် ဖော်ပြပါ သုတေသန လုပ်ငန်း
နှင့်ပတ်သက်သော အချက်အလက်များကို ဖတ်ရှုသိရှိခဲ့ပြီး ကောင်းမွန်စွာ
သဘောပေါက်နားလည်ပြီး ဖြစ်ပါသည်။
ကျွန်ုပ် သည် အောက်ပါအချက်အလက်များကို နားလည်သဘောပေါက်ပါသည်။

၁။ လေ့လာမှု၏ ဆောင်ရွက်ပုံအဆင့်ဆင့်၏ ရည်ရွယ်ချက်။
၂။ လေ့လာမည့် မေးခွန်းများ။
၃။ ကသိကအောက် ဖြစ်ခြင်း (သို့)အန္တရာယ် တစ်စုံ တစ်ရာကျရောက်မှုမရှိခြင်း။
၄။ မည်သည့်မေးခွန်း ကို မဆို မဖြေဆိုလို လျှင် ငြင်းပယ်ခွင့်ရှိခြင်း။
၅။ မေးခွန်းဖြေဆိုခြင်းကို မည်သည့် အကြောင်းပြ ချက်မှ ပေးရန် မလိုဘဲ ရပ်ဆိုင်း နိုင်ခြင်း။
၆။ ဖြေကြားချက် အားလုံးကို လျှို့ဝှက်ချက်အဖြစ် လုံခြုံစွာ ထိန်းသိမ်းထားပြီး၊စာတမ်းရေးသား ရာတွင်လည်း ကျွန်ုပ်(မည်သူ၊ မည်ဝါ မှ) ဖြေဆို သောအဖြေများ ဖြစ်ကြောင်းကို သိရှိပြီးဖြစ်သည်။

_____

ပါဝင်ရန်သဘောတူသူ(ထိုးမြှဲလက်မှတ်)

ရက်စွဲ။ ။_____

ကျွန်မ _____ သည် အထက်ဖော်ပြပါ သုတေသန လုပ်ငန်း နှင့် ပတ်သက်သော လေ့လာမှု၏ ဆောင်ရွက်ပုံ အဆင့်ဆင့် ကို သုတေသန လုပ်ငန်းတွင် ပါဝင် ပူးပေါင်းဆောင်ရွက်ရန် မေတ္တာ ရပ်ခံချက် တောင်းခံလွှာ အတိုင်း ရှင်းလင်း တင်ပြ ပြီး ဖြစ်ပါသည်။ ကျွန်တော်၊ ကျွန်မ သည်တို့ဆုံ မေးမြန်းသူ များ၏ အချက်အလက် များလည်း လျှို့ဝှက်စွာ ထိန်းသိမ်းထားမည်ဖြစ်ပါသည်။

_____ _____

သုတေသနပြုသူအမည်

သုတေသနပြုသူလက်မှတ်

နေ့စွဲ☐ ☐_____

(ထိုးမြှဲလက်မှတ်)

Appendix 6: Ethnical approval from the University of Tokyo, Japan

倫　理　委　員　会

審査結果報告書

平成24年12月21日

申請者（研究責任者）
国際地域保健学
教授
神馬 征峰　殿

東京大学大学院医学系研究科長・医学部長
宮園　浩平

審査番号　10006

研究課題　ミャンマー、ムセにおけるアンフェタミン系覚せい剤の使用開始年齢とジェンダーの関連

上記研究計画を平成24年12月17日の委員会で審査し下記のとおり判定しました。
ここに通知します。

判　定

○承認する　　条件付きで承認する
変更を勧告する　　承認しない
該当しない

Appendix 7: Ethnical approval from Defence Services Medical Research Centre, Nay Pyi Taw, Myanmar

Office of the Commander in Chief (Army)

Directorate of Medical Services

Defence Services Medical Research Centre

DSMRC,TatKon Township

Nay Pyi Taw

Telephone: +95-9402700750

Document No: 1/2/IRB-7

Dated: 9.1.2013

The Institutional Review Board on biomedical research involving human subjects, Defence Services Medical Research Centre, approves to conduct the following proposed research project.

Gender difference in initiation into amphetamine type of stimulant use in Muse, Myanmar

Principal Investigator: **Daw Saw Yu Mon**

Colonel Tin Maung Hlaing

(Chair)

Institutional Review Board

Defence Services Medical Research Centre

Nay Pyi Taw

Republic of the Union of Myanmar

Appendix 8: Questionnaire (English)

SECTION A: BACKGROUND CHARACTERISTICS

We would like to start by asking some general questions.				
A1	Sex	Male Female Other (specify) _____		
A2	What is your age? (in complete years) ESTIMATE BEST ANSWER	Age Don't know No response	[__|__] 88 99	
A3	Marital status	Single Married Divorced Widower	1 2 3 4	
A4	What is your race or ethnic background?	----------		
A5	What grade of school did you finish?	Never attended school Enter grade University No response	0 [__|__] 22 99	
A6	What is your major occupation?	Job Business Student Other (specify)	1 2 3	
A7	Average income per month (Given by parents/relatives)	Kyat/Months		
A8	Total monthly spending per month	Kyat/Months		
A9	When you are at school or university where do you live or sleep most of the time during the school or university term?	Parents' house Relative's house Friend's house Rented apartment Dormitory Other (specify)	1 2 3 4 5	
A10	How long have you been in this location?	Month/Year Since birth Other (specify)	1	

SECTIONB: KNOWLEDGE OF DIFFERENT AMPHETAMINE TYPE STIMULANTS

We are now going to ask you some questions about your ATS use. Try to remember about what drug you have used and how you used them; remember your answers are confidential.

			Yes	No	
B1	Have you ever heard of the following type of amphetamines?	Methamphetamine (Yama/Yaba)	1	0	
		K-methamphetamine	1	0	
		Ecstasy	1	0	
		Ice	1	0	
		Other (specify)			
B2	Where did you hear about these amphetamine type stimulants from?	Government awareness campaigns	**Yes** 1	**No** 0	
		The media (Radio, TV, Poster, ect)	1	0	
		Friend at school or university	1	0	
		Friend who is not from school	1	0	
		Friend from work	1	0	
		Other (specify)			
B3	Do you understand the differences between all the different types of ATS?	No	0		
		Yes	1		
		No response	99		
B4	What do you know about the effects of ATS? (***please answer every statement***)		**Yes**	**No**	
		ATS can lead to increase energy	1	0	
		ATS are associated with increased ability to work long hours	1	0	
		ATS are commonly used by young people to have fun	1	0	
		ATS are can make your heart beat faster	1	0	
		ATS can be associated with euphoria	1	0	
		ATS can lead insomnia	1	0	
		ATS can mask the affects of alcohol so people using ATS drink more alcohol	1	0	
		ATS can make people hallucinate	1	0	
		ATS can lead to violent activity/uncontrolled behavior	1	0	
		ATS can lead longer sexual intercourse	1	0	
		ATS can increase mental health problem in the short term and long term	1	0	

SECTION C: AWARENESS OF ATS USE IN THE COMMUNITY

We would like to ask you some questions about your awareness of ATS use in the community.				
C1	Do you know anyone who currently uses one or more types of ATS?	No Yes Don't know	0 1 88	→ C3
C2	How many people do you know who currently use some type of ATS? (Please write your answer as a number)	_____		
C3	How many people do you think currently use in your community?	None A few Some A lot Don't know	1 2 3 4 99	
C4	Do you know of any ATS users who have been arrested by the police in the last 12 months?	No Yes Don't know	0 1 88	
C5	How easy is it to currently access ATS in this city or the surrounding areas?	Extremely easy Easy Difficult Extremely difficult Don't know	1 2 3 4 5	
C6	Has the availability of ATS changed in the last 12 months?	Increased Decreased Stay the same Don't know	1 2 3 99	
C7	What do you think has affected the increase in availability of ATS in the last 12 months?	**Yes**	**No**	
	Increased drug trafficking	1	0	
	ATS use is becoming more popular	1	0	
	Decreased ATS suppression activity	1	0	
	Other (specify)			
C8	What do you think has affected the decrease in availability of methamphetamine in the last 12 months?	**Yes**	**No**	
	Increased drug trafficking	1	0	
	ATS use is becoming more popular	1	0	
	Decreased ATS suppression activity	1	0	

SECTION D: FIRST TIME USE SYNTHETIC DRUGS AND EFFECTS

The next set of questions is about using drugs. Please remember that your answers are strictly confidential. Your name is not on this form. No one can trace these answers back to you. If you do not want to answer certain questions you don't have to, but please answer all the questions that you can.

[If you answer no or don't know to the following question, please move to the next question]

No		Ampheta -mine	Ecstasy	Ice (Crystal-Meth)	Ketamin
D1	In what year and what age did you use (name of substances as next column) for the first time? Notice + Ask for solar-calendar age + Never use: 00 => move to next substance.	Year----- -- ---------- Age	Year----- ---------- Age	Year----- ---------- Age	Year----- ---------- Age
D2	Where did you use for the first-time?				
	Own home	1	1	1	1
	Friend/sexual partner's house	2	2	2	2
	School	3	3	3	3
	Dormitory	4	4	4	4
	Bar, discotheque	5	5	5	5
	Hotel/Guest house	6	6	6	6
	Restaurants	7	7	7	7
	Workplace	8	8	8	8
	Other (specify)	---------- --	----------	----------	----------
D3	Why did you use----- for the first time? (Multiple Choice Answers)				
	Curious about its effects	1	1	1	1
	Want to get out sadness or to Increase excited	2	2	2	2

	Encouraged by friend Encouraged by sexual partner Encouraged by drug dealers Other (specify)	3 4 5 ---------- --	3 4 5 ----------	3 4 5 ----------	3 4 5 ----------
D4	How did you get------for the first time use? Freely offered Asked others to buy I bought Sexual exchange for drugs Other (specify)	 1 2 3 4 ---------- --	 1 2 3 4 ----------	 1 2 3 4 ----------	 1 2 3 4 ----------
D5	What was your route of administration for the first time use? Smoke Inhale Drink Inject Other (specify)	 1 2 3 4 ---------- --	 1 2 3 4 ----------	 1 2 3 4 ----------	 1 2 3 4 ----------
D6	For this first-time use, did you use-----together with following substance: None Alcohol Heroin Other (specify)	 1 2 3 ---------- --	 1 2 3 ----------	 1 2 3 ----------	 1 2 3 ----------
D7	For this first-time use, whom did you use.... with? None, only me With friends With sexual partner With clients	 1 2 3 4	 1 2 3 4	 1 2 3 4	 1 2 3 4

	Other (specify)	---------- --	----------	----------	----------
D8	For this first-time use, except you, how many person(s) joined you?	------- per Of whom: ------ male ----- female	------ per Of whom: ----- male -----female	------ per Of whom: -----male -----female	------ per Of whom: ------male -----female
D9	Apart from route of administration for the first-time use, do you us---- in other route? MULTIPLECHOICE ANSWER Smoke Inhale Drink Inject Other (specify)	 1 2 3 4 ---------- --	 1 2 3 4 ----------	 1 2 3 4 ----------	 1 2 3 4 ----------
D10	In what year and what age did youinject-----for the first time? Never inject, mark 0	Year----- ---------- Age	Year------- ---------- Age	Year------- ---------- Age	Year------- ---------- Age
D11	In last 90 days, how do you use...? MULTIPLE CHOICE ANSWER	 1. Smoke 2. Inhale 3. Drink 4. Inject 5. Other	 1. Smoke 2. Inhale 3. Drink 4. Inject 5. Other	 11. Smoke 2. Inhale 3. Drink 4. Inject 5. Other	 1. Smoke 2. Inhale 3. Drink 4. Inject 5. Other

		(specify) _____ _____ 6. Not use in last 90 days => D14	(specify) _____ _____ 6. Not use in last 90 days => D14	(specify) _____ _____ 6. Not use in last 90 days => D14	(specify) _____ _____ 6. Not use in last 90 days => D14
D12	In last 90 days, how often did you use amphetamine /ecstasy/ice/ketamine? Several times/ week Once / week Several times / month 1 – 2 times in last 90 days	 1 2 3 4	 1 2 3 4	 1 2 3 4	 1 2 3 4
D13	In last 90 days, when was the most recent time you used ... accounting up today? If used today, mark as 0	_____ day(s)	_____ day(s)	_____ day(s)	_____ day(s)
D14	Based on your own experience, what is effect(s) of these substances? MUTIPLE CHOICE ANSWER Increased energy in longer time Irregular heart beat Hallucinated Depressed	 1 2 3 4	 1 2 3 4	 1 2 3 4	 1 2 3 4

	Increased excited	5	5	5	5
	Increased sexual desire	6	6	6	6
	Longer sexual intercourse	7	7	7	7
	Participation in unsafe sex that never had before	8	8	8	8
	Sleeplessness	9	9	9	9
	Decreased appetite	10	10	10	10
	Violent activity / uncontrolled behavior	11	11	11	11
	Other (specify)	----------	----------	----------	----------

SECTION E: OTHER BEHAVIORS RELATED TO HEALTH

E1	What is the drug you used **most** in the **last month?**	Opium Heroin Marijuana Amphetamine-type of stimulant (Yaba, Yama, etc) Diazepam Cough Syrup/Formula/Shwe Pentazocine (Sosegom) Lomotil (More than 20 pills) Ecstasy Solvent/Glue Other (specify)_____	1 2 3 4 5 6 7 8 9 10
E2	In the last six months, did you use heroin?	No Yes No response	0 1 88
E3	In last six months, did you inject heroin?	No Yes No response	0 1 88
E4	If yes, in the past six months, did you give needle and syringe, which you had used, to other?	Yes No No response	1 2 88
E5	In the past six months, did you use needle and syringe, which had been used by other?	No Yes No response	0 1 88
E6	Have you ever had sex?	No Yes No response	0 1 88

E7	How old were you when you had fist sexual intercourse?	---------- Year (s)	
E8	Have you ever had sexual intercourse with person who was as same sex you?	No Yes No response	0→ E10 1 88
E9	In the past six months, how many person did you have homosexual intercourse?	---------- person(s)	
E10	Have you ever paid to have sexual intercourse?	No Yes No response	0→ E14 1 88
E11	In the past six months, how many person(s) have you paid to have sexual intercourse? Of whom, how many male? How many female?	---------- Person (s) Male ---------- Female----------	
E12	In latest sexual intercourse with person you paid, how often did you use condom for sexual intercourse?	Always Almost Sometime Never Don't remember	1 2 3 4 99
E13	Did you ever have a sex with any of your paid partners after taking ATS drug?	No Yes No response	0 1 88
E14	Have you ever exchange to have sexual intercourse for money or drugs?	No Yes No response	0→ E18 1 88
E15	In the past six months, how many person(s) have you exchanged to have sexual intercourse? Of whom, how many male? How many female?	---------- Person (s) Male ---------- Female----------	
E16	In latest sexual intercourse with the	Always	1

	person you exchange, how often did you use condom for sexual intercourse?	Almost Sometime Never Don't remember	2 3 4 99
E17	Did you ever have a sex with your exchange partners after taking ATS drug?	No Yes No response	0 1 88
E18	Have you ever had sexual intercourse with causal partners (who you have sex with only once or occasionally, but who you do not pay)?	No Yes No response	0→ E22 1 88
E19	In the past six months, have you had sex with your causal partners? Of whom, how many male? How many female?	---------- Person (s) Male ---------- Female----------	
E20	In latest sexual intercourse with person you exchange, how often did you use condom for sexual intercourse?	Always Almost Sometime Never Don't remember	1 2 3 4 99
E21	Did you ever have a sex with any of your partners after taking ATS drug?	No Yes No response	0 1 88
E22	Have you ever heard about sexual transmission disease?	No Yes No response	0 1 88
E23	Have you ever been diagnosed to have any sexual transmission disease by any health clinic?	No Yes No response	0→ E26 1 88
E24	What were diseases? MUTIPLE CHOICE ANSWER	Chlamydia Gonorrhoea Syphilis HBV Genital warts	1 2 3 4 5

		HIV Other (specify)_____	6
E25	Have you ever been treated for sexual transmission disease [AT ANY HEALTH CLINIC WHERE HAD DIAGNOSIS OR EVEN AT PHAMARCY]?	No Yes No response	0 1 88
E26	Do you know any place where you can have HIV test?	No Yes No response	0→ E30 1 88
E27	Where are they? (subject can give name and surveyor mark HIV Voluntary testing suitable place)and counseling	Hospital Health facilities HIV Voluntary testing and counseling NGOs Other (specify)_____	1 2 3 4
E28	Have you ever test for HIV?	No Yes No response	0→ E31 1 88
E29	How many months since your latest test for HIV? (this month make as 0)	---------- Month(s)	
E30	Have you ever had intension to suicide?	No Yes No response	0→ E33 1 88
E31	If yes, have you ever tried to suicide?	No Yes No response	0 1 88
E32	Have you ever received treatment (or help) to help you stop using drugs?	No Yes No response	0 1 88

E33	Would you like to receive help to stop using or cut down the amount of drugs you use?	No Yes No response	0 1 88
E34	Have you ever get arrested by police for drug related offence?	No Yes No response	0 1 88
E35	Have you ever convicted for drug related offence?	No Yes No response	0 1 88

SECTION F: KNOWLEDGE ON HIV/AIDS PREVENTION

	We are nearly finished. These questions are about a HIV.			
F1	Have you ever heard of HIV or the disease called AIDS?	No Yes Don't know No response	0 1 88 99	→G1
F2	Do you know anybody who is suffering from HIV/ AIDS or died of AIDS?	No Yes Don't know No response	0 1 88 99	
F3	Do you know a relative or friend who has HIV/AIDS?	No Yes Don't know No response	0 1 88 99	
F4	Can a person protect himself or herself from getting HIV sexually by using a condom correctly every time they have sex?	No Yes Don't know No response	0 1 88 99	
F5	Can people protect themselves from getting HIV sexually by abstaining from sex?	No Yes Don't know No response	0 1 88 99	
F6	Can persons get HIV if they and their partners are faithful to each other and their partner is not infected?	No Yes Don't know No response	0 1 88 99	
F7	Can a person get HIV by sharing a meal with someone who is infected?	No Yes Don't know No response	0 1 88 99	
F8	Can a person get HIV by following injection with a needle that was already used by someone else?	No Yes Don't know	0 1 88	

		No response	99	
F9	Do you think that a healthy-looking person can have HIV?	No Yes Don't know No response	0 1 88 99	
F10	Can HIV/AIDS infected a pregnant woman transmit the infection to her unborn child?	No Yes Don't know No response	0 1 88 99	
F11	Can an HIV positive woman transmit the change of HIV transmission through breast-feeding?	No Yes Don't know No response	0 1 88 99	

That is the end of our questionnaire. Thank you very much for taking time to answer these questions. We appreciate your help.

Appendix 9: Questionnaire (Myanmar)

အပိုင်း(က) နောက်ခံအချက်အလက်၊လက္ခဏာများ။

က(၁)	ကျား / မ	ကျား မ အခြား ----------	၁ ၂	
က(၂)	အသက် (ပြည့်ပြီး အသက်ကိုရေးပါ)	နှစ် မသိပါ။ မဖြေဆိုလိုပါ။	[__|__] ၈၈ ၉၉	
က(၃)	သင်၏ လက်ရှိအိမ်ထောင်ရေး အခြေအနေ	တခါမှအိမ်ထောင်မပြုဘူးပါ။ အိမ်ထောင်ရှိသည်။ အိမ်ထောင်ကွဲနေသည်။ မုဆိုးဖို	၁ ၂ ၃ ၄	
က(၄)	ဘာလူမျိုးပါလဲ။	----------		
က(၅)	ပညာအရည်အချင်း (အောင်မြင်ခဲ့ပြီးသောအတန်း)	ကျောင်းမနေဖူးပါ။ ကျောင်းနေဖူးပါက တက္ကသိုလ် မဖြေဆိုလိုပါ။	0 [___] တန်း ၂၂ ၉၉	
က(၆)	သင်ရဲ့အမိက အလုပ်အကိုင်မှာ ဘာဖြစ်ပါသလဲ။	----------		
က(၇)	သင့် ရဲ့လစဉ် ပျမ်းမျှဝင်ငွေ ဘယ်လောက်ပါ လဲ။ (မိဘ ၊ ဆွေမျိုးထံမှ လစဉ် ရငွေ)	---------- ကျပ်		

၈(၈)	လစဉ် အသုံးစရိတ် (လစဉ် / တစ်လ ပျမ်းမျှ အသုံးစရိတ်)	---------- ကျပ်		
၈(၉)	အတန်းကျောင်း (သို့) တက္ကသိုလ် တွင် ပညာ တက်ရောက် သင်ကြားစဉ် အများဆုံး နေထိုင်/အိပ် ဖြစ်သော နေရာမှာ	မိဘအိမ် ဆွေမျိုးအိမ် သူငယ်ချင်းအိမ် အခန်း ငှားနေသည်။ အဆောင် ငှားနေသည်။ အခြား (ဖော်ပြပါ။)---------	၁ ၂ ၃ ၄ ၅ 	
၈(၁၀)	ယခု နေရာ / မြို့တွင် နေထိုင်သည်မှာ အချိန် ဘယ်လောက်ကြာကြာရှိပါပြီလဲ။	-------- လ / ------- နှစ် မွေးဖွားစဉ်ကထဲက	 ၁	

အပိုင်း (ခ) စိတ်ကြွဆေးအမျိုးအစား နှင့်ပတ်သက်သောဗဟုသုတ

စိတ်ကြွဆေးအမျိုးအစား နှင့်ပတ်သက်သောအကြောင်းအရာများကိုမေးမြန်းပါမည်။ ဖြေကြားချက်များအားလုံးကို လုံခြုံစွာ သိမ်းထားမည်ဖြစ်ပြီး လျှို့ဝှက်ချက်အားလုံးကို စောင့်စည်းမည်ဖြစ်ကြောင်းအာမခံပါသည်။					
ခ(၁)	အောက်ပါစိတ်ကြွဆေးအမျိုးအစားများကို ကြားဖူးပါသလား?		သိပါသည်။	မသိပါ။	
		မီသဖက်တမင်း(ရာမ ،ရာဘ)	၁	၀	
		ကတ်တမင်း			
		အက်တစီ	၂	၀	
		အိုက်စ်(Ice)	၃	၀	
			၄	၀	
		အခြား (ဖော်ပြပါ။)			

ခ(၂)	အထက်ဖော်ပြပါ စိတ်ကြွဆေးများကို သင် ဘယ်ကကြားဖူးပါသလဲ?				
		အစိုးရ ပညာပေး	၁	၀	
		အစီအစဉ်များမှ			
		မီဒီယာ (ရေဒီယို ، တီဗီ ،	၂	၀	
		လက်ကမ်းစာစောင် ،			
		ပိုစတာ ،			
		ကြေညာဆိုင်းဘုတ်)			
		အတန်းကျောင်း /	၃	၀	
		တက္ကသိုလ် ရှိ			
		သူငယ်ချင်းထံမှ			
		အပြင်သူငယ်ချင်းထံမှ			
		(ကျောင်းတွင်ခင်သော	၄	၀	
		သူငယ်ချင်းမမဟုတ်ပါ။)			
		လုပ်ငန်းခွင် ရှိ	၅	၀	
		သူငယ်ချင်းထံမှ			
		အခြား (ဖော်ပြပါ။)			

ခ(၃)	စိတ်ကြွဆေး တစ်မျိုး နှင့် တစ်မျိုး ကွဲပြားခြားနားမှုကို သိပါသလား။	မသိပါ။ သိပါသည်။ မဖြေလိုပါ။	၀ ၁ ၉၉		
ခ(၄)	စိတ်ကြွဆေး သုံးစွဲခြင်း၏ အကျိုးဆက်ကို သိပါသလား။ (မေးခွန်းတိုင်းကိုဖြေဆိုပါ။)		ဟုတ်ပါသည်။	မဟုတ်ပါ။	
	ကာယ ၊ ဉာဏ စွမ်းအင်ကို တိုးပွားစေသည်။		၁	၀	
	အချိန်ကြာကြာ အလုပ်လုပ်နိုင်စေသည်။		၁	၀	
	သာမန်အားဖြင့် လူငယ်များက အပျော်သက်သက်သုံးစွဲကြသည်။		၁	၀	
	နှလုံးခုန်နှုန်းကို မြန်ဆန်စေသည်။		၁	၀	
	ပေါ့ပါးပျော်ရွှင် လန်းဆန်းစေသည်။		၁	၀	
	မအိပ်ဘဲ နေနိုင်သည်။		၁	၀	
	အရက်၏ အာနိသင်ကို လျော့နည်းစေပြီး အရက်ကို ပိုမို သောက်သုံးနိုင်စေသည်။		၁	၀	
	စိတ်ထင်ယောင် ထင်မှားဖြစ်စေသည်။		၁	၀	
	မိမိကိုယ်ကို မထိန်းချုပ်နိုင်ဘဲ ရန်လိုသော အပြုအမူကို ပြုမူစေသည်။		၁	၀	
	လိင်ဆက်ဆံသည့်အချိန်ကိုသာမာန်ထက်ပို၍ရှည်ကြာစေနိုင်သည်။		၁	၀	
	ရေတိုတွင် လည်းကောင်း ၊ ရေရှည်တွင်လည်းကောင်း စိတ်ကျန်းမာရေးပြဿနာကို တိုးပွားစေသည်။		၁	၀	

အပိုင်း (၈) ပြည်သူလူထု အကြား စိတ်ကြွဆေးနှင့်ပတ်သက်သော အသိပညာ

စိတ်ကြွဆေးနှင့်ပတ်သက်သော အသိပညာဆိုင်ရာမေးခွန်းများကိုမေးမြန်းပါမည်။				
၈(၁)	ယခုလောလောဆယ် စိတ်ကြွဆေးတစ်မျိုး (သို့) တစ်မျိုးထက်ပို သုံးစွဲနေသူကို သိပါသလား။	မသိပါ။ သိပါသည်။ မဖြေဆိုလိုပါ။	၀ ၁ ၈၈	→၈(၁) သို့
၈(၂)	ယခုလောလောဆယ် စိတ်ကြွဆေးသုံးစွဲနေသည့် သင်သိသော လူ အရေအတွက်ဘယ်လောက်ရှိပါ သလဲ။	---------- ယောက်		
၈(၃)	သင့်ပတ်ဝန်းကျင် တွင် စိတ်ကြွဆေး သုံးစွဲသူ ဘယ်နှစ်ယောက်ရှိပါသလဲ။	မရှိပါ။ အနဲငယ် အချို့ အများအပြား မဖြေဆိုလိုပါ။	၁ ၂ ၃ ၄ ၈၈	
၈(၄)	လွန်ခဲ့သော ၁၂ လ အတွင်း စိတ်ကြွဆေးသုံးစွဲ၍ ရဲမှ ဖမ်းဆီးခံရသူကို သိပါသလား။	မသိပါ။ သိပါသည်။ မဖြေဆိုလိုပါ။	၀ ၁ ၈၈	
၈(၅)	စိတ်ကြွဆေးကို လက်ရှိသင့် ပတ်ဝန်းကျင် (သို့) သင့် မြို့ ၊ ရွာ တွင် အလွယ်တကူ ရရှိနိုင်ပါသလား။	အလွန်လွယ်ကူပါသည်။ အလွယ်တကူ ရရှိနိုင်ပါသည်။ ခက်ခဲသည်။ အလွန်ခက်ခဲသည်။ မဖြေဆိုလိုပါ။	၁ ၂ ၃ ၄ ၈၈	

၈(၆)	လွန်ခဲ့သော ၁၂လ အတွင်း စိတ်ကြွဆေး ဝယ်ယူရရှိနိုင်မှု အပြောင်းအလဲ ရှိပါသလား။	အပြောင်းအလဲရှိပါသည်။ အပြောင်းအလဲမရှိပါသည်။ အရင်အတိုင်း မဖြေဆိုလိုပါ။	၁ ၂ ၃ ၈၈	
၈(၇)	လွန်ခဲ့သော ၁၂လ အတွင်း စိတ်ကြွဆေး စိတ်ကြွဆေး ဝယ်ယူရရှိမှု ပိုမိုလွယ်ကူလာခြင်းသည် အောက်ပါ အချက်အလက်များထဲမှ တစ်ခုကြောင့်ဖြစ်သည်။ ဆေးမှောင်ခို ရောင်းဝယ်မှု များလာခြင်း စိတ်ကြွဆေး သုံးစွဲမှု ရေပန်းစားလာခြင်း စိတ်ကြွဆေး ဖမ်းဆီးမှု လျော့ကျလာခြင်း အခြား (ဖော်ပြပါ။)----------	ဟုတ်ပါသည်။ ၁ ၁ ၁	မဟုတ်ပါ။ ၀ ၀ ၀	
၈(၉)	လွန်ခဲ့သော ၁၂လ အတွင်း စိတ်ကြွဆေး စိတ်ကြွဆေး ဝယ်ယူရရှိမှု ပိုမူခက်ခဲလာခြင်းသည် အောက်ပါ အချက်အလက်များထဲမှ တစ်ခုကြောင့်ဖြစ်သည်။ ဆေးမှောင်ခို ရောင်းဝယ်မှု များလာခြင်း စိတ်ကြွဆေး သုံးစွဲမှု ရေပန်းစားလာခြင်း စိတ်ကြွဆေး ဖမ်းဆီးမှု လျော့ကျလာခြင်း အခြား (ဖော်ပြပါ။)----------	ဟုတ်ပါသည်။ ၁ ၁ ၁	မဟုတ်ပါ။ ၀ ၀ ၀	

အပိုင်း(ဃ) : ပထမဆုံးအကြိမ်စိတ်ကြွဆေးသုံးစွဲသည့်အတွေ့အကြုံ

စိတ်ကြွဆေးသုံးစွဲမှုနှင့်ပတ်သက်သောအကြောင်းအရာများကိုမေးမြန်းပါမည်။ကြိုးစား၍ဖြေဆိုပေးစေလိုပါသည်။ဖြေကြားချက်များအားလုံးကို လုံခြုံစွာ သိမ်းထားမည်ဖြစ်ပြီး လျှို့ဝှက်ချက်အားလုံးကို စောင့်စည်းမည်ဖြစ်ကြောင်းအာမခံပါသည်။

		မီသဖက်တမင်း (ရာမ ၊ရာဘ)	အက်တစီ (ခေါင်းခါဆေး)	အိုက်စ် (Ice)	ကတ်တမင်း
ဃ(၁)	မည်သည့် အသက်အရွယ် နှင့် မည်သည့် ခုနှစ်တွင် အောက်ပါ ဆေးအမျိုးအစားများကို ပထမဆုံးအကြိမ် သုံးစွဲခဲ့ပါသလဲ။	---------- ခုနှစ် ---------- နှစ်	---------- ခုနှစ် ---------- နှစ်	---------- ခုနှစ် ---------- နှစ်	---------- ခုနှစ် ---------- နှစ်
ဃ(၂)	သင် စိတ်ကြွဆေးကို မည်သည့် နေရာတွင် ပထမဆုံး အကြိမ် သုံးစွဲခဲ့ ပါသလဲ။				
	မိမိနေအိမ် တွင်	၁	၁	၁	၁
	သူငယ်ချင်း / လင်ဆက်ဆံ				
	ဘက်အိမ်တွင်	၂	၂	၂	၂
	ကျောင်းတွင်	၃	၃	၃	၃
	အဆောင်တွင်	၄	၄	၄	၄
	ကလပ် (သို့)				
	ကာရာအိုကေဆိုင်တွင်	၅	၅	၅	၅
	ဟိုတယ် (သို့)တည်းခိုခန်း				
	စားသောက်ဆိုင်တွင်	၆	၆	၆	၆
	အလုပ်ခွင်တွင်	၈	၈	၈	၈
	အခြား (ဖော်ပြပါ။)---------- -	----------	----------	----------	----------
ဃ(၃)	သင်ဘာကြောင့် စိတ်ကြွဆေးကို ပထမဆုံးအကြိမ် စတင်သုံးစွဲဖြစ်ပါသလဲ။ (အဖြေ ၂မျိုးထက်မက				

	ဖြေနိုင်သည်) စူးစမ်းလိုခြင်း စိတ်မပျော်ရွှင်မှုမှ လွတ်မြောက်လို ၍ (သို့)စိတ်တက်ကြွပျော်ရွှင်လိုခြင်း သူငယ်ချင်းများက တိုက်တွန်းခြင်း လိင်ဆက်ဆံဖက်မှ တိုက်တွန်းခြင်း မူးယစ်ဆေးဝါးရောင်းချသူမှ တိုက်တွန်းခြင်း အခြား (ဖော်ပြပါ။)----------	၁ ၂ ၃ ၄ ၅ ----------	၁ ၂ ၃ ၄ ၅ ----------	၁ ၂ ၃ ၄ ၅ ----------	၁ ၂ ၃ ၄ ၅ ----------
ယ(၄)	ပထမဆုံးအကြိမ် သုံးစွဲသောအောက်ပါ စိတ်ကြွဆေးကို သင် ဘယ်လိုရရှိခဲ့ပါသလဲ။ အလကားရခြင်း အခြားသူကို ဝယ်ခိုင်းခြင်း မိမိကိုယ်တိုင် ဝယ်ယူခြင်း မိမိကိုယ်တိုင် ဝယ်ယူခြင်း အခြား (ဖော်ပြပါ။)----------	၁ ၂ ၃ ၄ ----------	၁ ၂ ၃ ၄ ----------	၁ ၂ ၃ ၄ ----------	၁ ၂ ၃ ၄ ----------
ယ(၅)	ပထမဆုံးအကြိမ် ဆေးကို မည်သို့ သုံးစွဲခဲ့ပါသလဲ။ ဖွာ၍ (စီးကရက်) ရှူရှိုက်၍ သောက်သုံး၍ ထိုးသွင်း၍	၁ ၂ ၃ ၄	၁ ၂ ၃ ၄	၁ ၂ ၃ ၄	၁ ၂ ၃ ၄

	အခြား (ဖော်ပြပါ။)---------- -	----------	----------	----------	----------
ယ(၆)	ပထမဆုံးအကြိမ် ဆေးသုံးစွဲစဉ်ကအောက်ဖော်ပြပါ တစ်ခုခုနှင့် တွဲ၍ သုံးစွဲခဲ့ပါသလား။ တွဲ၍မသုံးစွဲပါ အရက် / ဘီယာ ဘိန်းဖြူ အခြား (ဖော်ပြပါ။)----------	၁ ၂ ၃ ----------	၁ ၂ ၃ ----------	၁ ၂ ၃ ----------	၁ ၂ ၃ ----------
ယ(၇)	ပထမဆုံး အကြိမ် ဆေးသုံးစွဲစဉ်ကမည်သူနှင့် သုံးစွဲခဲ့ပါသလဲ။ တစ်ယောက်တည်း သူငယ်ချင်းနှင့်အတူ လိင်ဆက်ဆံဖက်နှင့် အတူ မူးယစ်ဆေးဝါး စွဲနေသူနှင့် အတူ အခြား (ဖော်ပြပါ။)---------- -	၁ ၂ ၃ ၄ ----------	၁ ၂ ၃ ၄ ----------	၁ ၂ ၃ ၄ ----------	၁ ၂ ၃ ၄ ----------
ယ(၈)	ပထမဆုံးအကြိမ် စိတ်ကြွဆေးသုံးစွဲစဉ်က ဘယ်နှစ်ယောက်နှင့် အတူ သုံးစွဲခဲ့ ပါသလဲ။ (သင်မပါ)	--------- ယောက် အမျိုးသား ---------	--------- ယောက် အမျိုးသား ---------	--------- ယောက် အမျိုးသား ---------	--------- ယောက် အမျိုးသား ---------

		ယောက် အမျိုးသမီး --------- ယောက်	ယောက် အမျိုးသမီး --------- ယောက်	ယောက် အမျိုးသမီး --------- ယောက်	ယောက် အမျိုးသမီး --------- ယောက်
၁၀(၉)	ပထမဆုံးအကြိမ် စိတ်ကြွဆေး သုံးစွဲခဲ့သော နည်းလမ်းအပြင် အခြား မည်သည့်နည်းဖြင့် သုံးစွဲ ခဲ့ဖူးပါသလဲ။ (အဖြေ ၁ ခုထက်မက ဖြေနိုင်သည်။) ဖွာ၍ (စီးကရက်) ရှူရှိုက်၍ သောက်သုံး၍ ထိုးသွင်း၍ အခြား (ဖော်ပြပါ။)--------	၁ ၂ ၃ ၄ ----------	၁ ၂ ၃ ၄ ----------	၁ ၂ ၃ ၄ ----------	၁ ၂ ၃ ၄ ----------
၁၀(၁၀)	သင် အသက် ဘယ်နှနှစ်အရွယ် နှင့် မည်သည့် ခုနှစ်တွင် စိတ်ကြွဆေးကို ပထမဆုံးအကြိမ် ထိုးသွင်းဖူးပါသလဲ။ (မထိုးသွင်းပါက ' 0 ' ဟုရေးပါ။)	-------- ခုနှစ် ---------- နှစ်	-------- ခုနှစ် ---------- နှစ်	-------- ခုနှစ် ---------- နှစ်	-------- ခုနှစ် ---------- နှစ်
၁၀(၁၁)	လွန်ခဲ့သော ရက် ၉၀ အတွင်း စိတ်ကြွဆေးကို မည်သည့် နည်းဖြင့် သုံးစွဲဖူးပါသလဲ။ (အဖြေ ၁ ခုထက်မက ဖြေနိုင်သည်။) ဖွာ၍ (စီးကရက်) ရှူရှိုက်၍ သောက်သုံး၍ ထိုးသွင်း၍	၁ ၂ ၃ ၄	၁ ၂ ၃ ၄	၁ ၂ ၃ ၄	၁ ၂ ၃ ၄

	အခြား (ဖော်ပြပါ။)--------	----------	----------	----------	----------
၁၂(ခ)	လွန်ခဲ့သော ရက် ၉၀ အတွင်း အောက်ပါ စိတ်ကြွဆေး အမျိုးအစားများကို အကြိမ် မည်မျှ သုံးစွဲခဲ့ပါသလဲ? တစ်ပတ်အတွင်း ၂ ကြိမ် နှင့် ၂ ကြိမ်အထက် တစ်ပတ်အတွင်းတစ်ကြိမ်သာ တစ်လအတွင်း ၂ကြိမ် နှင့် ၂ ကြိမ်အထက် လွန်ခဲ့သော ရက် ၉၀ အတွင်း ၁ကြိမ် မှ ၂ကြိမ်	၁ ၂ ၃ ၄	၁ ၂ ၃ ၄	၁ ၂ ၃ ၄	၁ ၂ ၃ ၄
၁၃(ခ)	လွန်ခဲ့သော ရက် ၉၀ မှ ယနေ့အထိ (နောက်ဆုံး) စိတ်ကြွဆေး သုံးစွဲခဲ့သော စုစုပေါင်းရက် အရေအတွက် (ယနေ့သုံးစွဲခဲ့လျှင်"၀" ဟုရေးပါ)	_____ ရက်	_____ ရက်	_____ ရက်	_____ ရက်
၁၄(ခ)	သင်ဖေါ်ဆေးသုံးစွဲမှုအတွေ့အကြုံအရ အောက်ပါအကျိုးဆက်များကို ဖြစ်စေနိုင်သည်။ (အဖြေ ၁ ခုထက်မက ဖြေနိုင်သည်။) ကာယ ညာဏစွမ်းအင်ကို အချိန်ကြာမြင့်စွာ တိုးပွါးစေသည်။ နှလုံးခုန် မမှန်ဖြစ်စေသည်။ ထင်ယောင်ထင်မှားဖြစ်စေသည်။	၁ ၂ ၃	၁ ၂ ၃	၁ ၂ ၃	၁ ၂ ၃

	စိတ်ဓါတ်ကျဆင်းစေသည်။ စိတ်လှုပ်ရှားမှုကိုတိုးပွားစေသည်။ ကာမဆန္ဒကို တိုးပွားစေသည်။ လိင်ဆက်ဆံနိုင်စွမ်းတိုးမြှင့် စေသည်။/လိင်ဆက်ဆံချိန်ကြာမြင့် စေသည်။ ယခင်က မလုပ်ခဲ့ဘူးသော အကာအကွယ်မဲ့ လိင်ဆက်ဆံမှုကို ဖြစ်စေသည်။ မအိမ်ဘဲနေနိုင်စေသည်။ အစာစားချင်စိတ်ကို လျော့နည်းစေသည်။ မိမိကိုယ်ကို မထိန်းချုပ်နိုင်ဘဲ ရန်လိုသော အပြုအမူကို ပြုမူစေသည်။ အခြား (ဖော်ပြပါ။)----------	၄ ၅ ၆ ၇ ၈ ၉ ၁၀ ၁၁ ----------	၄ ၅ ၆ ၇ ၈ ၉ ၁၀ ၁၁ ----------	၄ ၅ ၆ ၇ ၈ ၉ ၁၀ ၁၁ ----------	၄ ၅ ၆ ၇ ၈ ၉ ၁၀ ၁၁ ----------

အပိုင်း(c) ကျန်းမာရေးနှင့်သက်ဆိုင်သောအပြုအမူများ

c(၁)	လွန်ခဲ့သောတစ်လ အတွင်းဘယ်ဆေးကို အများဆုံးသုံးဖြစ်ခဲ့သလဲ။ (အဖြေများကို ဖတ်ပြရန်မလိုပါ) (အဖြေတခုတည်းသာဖြေဆိုရန်)	ဘိန်းမဲ ဘိန်းဖြူ ဆေးခြောက် စိတ်ကြွဆေး(ရာမ၊ရာဘ) ဒိုင်ယာဇီပင် ချောင်ဆိုးပျောက်ဆေး၊ ဖော်မျူလာ၊ရွှေ ပင်တာဖိုစင်း (ဆော်ဇီဂုံ) လိုမိုတင်း(လ) အလုံး၂၀ကျော် အက်စတစီ ကော် အခြား(ဖော်ပြပါ) ----------	၁ ၂ ၃ ၄ ၅ ၆ ၇ ၈ ၉
c(၂)	လွန်ခဲ့သောဝါလအတွင်း ဘိန်းဖြူသုံးစွဲဘူးပါသလား။	မသုံးခဲ့ပါ။ သုံးခဲ့သည်။ မဖြေပါ။	၀→c(၆)သို့ ၁ ၈၈
c(၃)	လွန်ခဲ့သောဝါလအတွင်း ဘိန်းဖြူကို အကြောထဲ ထိုးသွင်း သုံးစွဲဘူးပါသလား။	မထိုးပါ။ ထိုးပါသည်။ မဖြေပါ။	၀→c(၆)သို့ ၁ ၈၈
c(၄)	လွန်ခဲ့သောဝါလတွင် သင်သုံးပြီးသား ဆေးထိုးအပ် နဲ့ ဆေးထိုးပြွန်ကို တခြားသူတစ်ဦးတစ်ယောက်ကို ပေးသုံးခိုင်းခဲ့ဘူးပါသလား။	မသုံးခိုင်းခဲ့ဘူးပါ။ သုံးခိုင်းခဲ့ဘူးပါသည်။ မဖြေပါ။	၀ ၁ ၈၈
c(၅)	လွန်ခဲ့သောဝါလ အတွင်း သူများသုံးပြီးသားဆေးထိုးအပ်နဲ့ဆေ ထိုးပြွန်ကိုသုံးခဲ့ ပါသလား။	မသုံးခဲ့ပါ။ သုံးခဲ့သည်။ မဖြေပါ။	၀ ၁ ၈၈

c(၆)	သင်လိုင်ဆက်ဆံခဲ့ဘူးပါသလား။	မဆက်ဆံဘူးပါ။ ဆက်ဆံဘူးပါသည်။ မဖြေပါ။	၀ ⇨ c(၂၂)သို့ ၁ ၈၈
c(၇)	သင်ပထမဆုံးအကြိမ်လိုင်ဆက်ဆံ စဉ်က အသက်မည်မျှရှိပြီလဲ။	----------နှစ်	
c(၈)	သင်လိုင်တူသူများနှင့်လိုင်ဆက်ဆံခဲ့ပါ သလား။	မဆက်ဆံဘူးပါ။ ဆက်ဆံဘူးပါသည်။ မဖြေပါ။	၀ ⇨ c(၁၀)သို့ ၁ ၈၈
c(၉)	လွန်ခဲ့သောဖိလအတွင်း သင် နှင့် လိုင်တူသူ ဘယ်နှစ်ယောက်နဲ့ သင် လိုင်ဆက်ဆံခဲ့ ဘူးပါသလဲ။	---------- ယောက်	
c(၁၀)	သင်အခကြေးငွေ ပေးဂျသော သူနှင့် လိုင် ဆက်ဆံခဲ့ဘူးပါသလား။	မဆက်ဆံဘူးပါ။ ဆက်ဆံဘူးပါသည်။ မဖြေပါ။	၀ ⇨ c(၁၄)သို့ ၁ ၈၈
c(၁၁)	လွန်ခဲ့သောဖိလအတွင်း သင် အခကြေးငွေပေးရသောသူဘယ်နှစ်ယောက်နဲ့ လိုင်ဆက်ဆံခဲ့ဘူးပါသလဲ။	---------- ယောက် အမျိုးသား ---------- ယောက် အမျိုးသမီး---------- ယောက်	
c(၁၂)	သင်၏ နောက်ဆုံး အခကြေးငွေပေးရသော လိုင်ဆက်ဆံဖက်တို့လိုင်ဆက်ဆံ ရာတွင် ကွန်ဒုံး ကို ဘယ်နှစ်ကြိမ် အသုံးပြုခဲ့သလဲ။	အမြဲတမ်း အမြဲတမ်းလိုလို တခါတရံ မကြာမကြာအခါအခွင့်သင့်သလို ဘယ်တော့မှမသုံး	၁ ၂ ၃ ၄ ၅

		မဖြေပါ။ မမှတ်မိပါ။	၆ ၇
c(၁၃)	သင်စိတ်ကြွဆေးသုံးစွဲပြီး အခကြေးငွေပေးရသောသူနှင့် လိင်ဆက်ဆံ ဘူးပါသလား။	မဆက်ဆံဘူးပါ။ ဆက်ဆံဘူးပါသည်။ မဖြေပါ။	၀ ၁ ၈၈
c(၁၄)	လွန်ခဲ့သောဖလ အတွင်း ဆေး(သို့) အခကြေးငွေရယူ၍ သင်လိင် ဆက်ဆံခဲ့ဘူးပါသလား။	မဆက်ဆံဘူးပါ။ ဆက်ဆံဘူးပါသည်။ မဖြေပါ။	၀ ⇨ **c(၁၈)သို့** ၁ ၈၈
c(၁၅)	လွန်ခဲ့သောဖလ အတွင်း ဆေး(သို့) အခကြေးငွေရယူ၍ ဘယ်နှစ်ယောက်နဲ့ သင်လိင်ဆက်ဆံခဲ့ဘူးပါသလား။	---------- ယောက် အမျိုးသား ---------- ယောက် အမျိုးသမီး---------- ယောက်	
c(၁၆)	သင်၏ နောက်ဆုံး ဆေး(သို့) အခကြေးငွေရသော လိင်ဆက်ဆံဖက်တို လိင်ဆက်ဆံရာတွင် ကွန်ဒုံးကို ဘယ်နှစ်ကြိမ် အသုံးပြုခဲ့သလဲ။	အမြဲတမ်း အမြဲတမ်းလိုလို တခါတရံ မကြာမကြာအခါအခွင့်သင့်သလို ဘယ်တော့မှမသုံး မဖြေပါ။ မမှတ်မိပါ။	၁ ၂ ၃ ၄ ၅ ၆ ၇
c(၁၇)	သင်စိတ်ကြွဆေးသုံးစွဲပြီး ဆေး(သို့)အခကြေးငွေ ရသော သူ နှင့် လိင်ဆက်ဆံဘူးပါသလား။	မဆက်ဆံဘူးပါ။ ဆက်ဆံဘူးပါသည်။ မဖြေပါ။	၀ ၁ ၈၈

c(၁၈)	သင့်မှာ လွန်ခဲ့သော ၆လအတွင်း သဘောတူလိင်ဆက်ဆံဖက်ရှိပါသလား။ (ဇနီးလည်းမဟုတ်၊ပုံမှန်အဖော်လည်းမဟုတ်၊ငွေကြေး(သို့) ဆေးနှင့်လဲလှယ်ခြင်းလည်းမဟုတ်သောသဘောတူလိင်ဆက်ဆံဖက်)	မဆက်ဆံဘူးပါ။ ဆက်ဆံဘူးပါသည်။ မဖြေပါ။	၀ ⇨ c(၁၈)သို့ ၁ ၈၈
c(၁၉)	လွန်ခဲ့သော၆လအတွင်း သဘောတူလိင်ဆက်ဆံဖက် ဘယ်နှစ်ယောက်နဲ့ လိင်ဆက်ဆံခဲ့ဘူးပါသလဲ။	---------- ယောက် အမျိုးသား ---------- ယောက် အမျိုးသမီး---------- ယောက်	
c(၂၀)	လွန်ခဲ့သော ၆လ အတွင်းသဘောတူ လိင်ဆက်ဆံဖက်တို့လိင်ဆက်ဆံရာတွင် ကွန်ဒုံး ကို ဘယ်နှစ်ကြိမ် အသုံးပြုခဲ့သလဲ။	အမြဲတမ်း အမြဲတမ်းလိုလို တခါတရံ မကြာမကြာအခါအခွင့်သင့်သလို ဘယ်တော့မှမသုံး မဖြေပါ။ မမှတ်မိပါ။	၁ ၂ ၃ ၄ ၅ ၆ ၇
c(၂၁)	သင်စိတ်ကြွဆေးသုံးစွဲ ပြီး သဘောတူ လိင်ဆက်ဆံဖက် နှင့် လိင် ဆက်ဆံ ဘူးပါသလား။	မဆက်ဆံဘူးပါ။ ဆက်ဆံဘူးပါသည်။ မဖြေပါ။	၀ ၁ ၈၈
c(၂၂)	လိင်ဆက်ဆံရာမှတဆင့် ကူးစက်တတ်သော ရောဂါအကြောင်းကြားဖူးပါသလား။	မကြားဖူးပါ။ ကြားဖူးပါသည်။ မဖြေပါ။	၀ ⇨ c(၂၄)သို့ ၁ ၈၈
c(၂၃)	ဆေးရုံ၊ဆေးခန်းတွင် လိင်ဆက်ဆံရာ	မစစ်ဆေးဖူးပါ။ စစ်ဆေးဖူးပါသည်။	၀ ⇨ c(၂၆)သို့ ၁

	မှတဆင့်ကူးစက်တတ်သောရောဂါရှိကြောင်း စစ်ဆေးဖူးပါသလား။	မဖြေပါ။	၈၈
c(၂၄)	ဘာရောဂါဖြစ် ဖူးသလဲ။	အဖြူဆင်းရောဂါ ဆီးပူညောင်းကျ ဆစ်ဖလစ် အသဲရောင်အသားဝါဘီပိုး လိင်အင်္ဂါကြွက်နို့ အိပ်ချိန်အိုင်ဒို အခြား(ဖော်ပြပါ) ----------	၁ ၂ ၃ ၄ ၅ ၆
c(၂၅)	လိင်ဆက်ဆံရာမှတဆင့် ကူးစက်တတ်သောရောဂါနှင့်ပတ်သက်ပြီးဆေးကုသမှုခံဖူးပါသလား (ဆေးဆိုင်တွင်ဆေးဝယ်ယူကုသခြင်းလည်းအကျုံးဝင်သည်)	မကုသဘူးပါ။ ကုသဘူးပါသည်။ မဖြေပါ။	၀ ၁ ၈၈
c(၂၆)	အိပ်ချိန်အိုင်ဒို့ပိုးရှိ၊ မရှိစစ်ဆေးနိုင်သည့် နေရာများကိုသင်သိပါသလား။	မသိပါ။ သိပါသည်။ မဖြေပါ။	၀ ⇨ c(၂၈)သို့ ၁ ၈၈
c(၂၇)	ဘယ်နေရာ မှာ အိပ်ချိန်အိုင်ဒို့ပိုး စစ်ဆေးနိုင်ပါသလဲ။	ဆေးရုံ၊ဆေးခန်း မိမိဆန္ဒအလျောက်လုံခြုံစွာ စစ်ဆေးပေးသောနေရာ လှုမ္ဘအဖွဲ့အစည်း အခြား ---------- ----	၁ ၂ ၃
c(၂၈)	သင့်တွင်အိပ်ချိန်ဒို့ပိုး ရှိ၊မရှိ စစ်ဆေးခဲ့ဘူးပါသလား။	မစစ်ဆေးဖူးပါ။ စစ်ဆေးဖူးပါသည်။ မဖြေပါ။	၀ ⇨ c(၃၀)သို့ ၁ ၈၈

၈(၂၉)	ဘယ်တုန်းက နောက်ဆုံးအကြိမ် သင့်တွင် အိပ်ချိုပြီး ရှိ၊မရှိ စစ်ဆေးခဲ့ဘူးပါသလား။ (ယခုလဆိုလျှင် ၀ ဟုရေးပါ။)	---------- လ	
၈(၃၀)	ကိုယ်ကိုကိုသေကြောင်းကြံစည်ရန်စဉ်းစားဖူးပါသလား။	မစဉ်းစားဖူးပါ။ စဉ်းစားဖူးပါသည်။ မဖြေပါ။	၀⇨ ၈(၃၀)သို့ ၁ ၈၈
၈(၃၁)	ကိုယ်ကိုကိုသေကြောင်းကြံစည်ဖူးပါသလား။	မကြံစည်ဖူးပါ။ ကြံစည်ဖူးပါသည်။ မဖြေပါ။	၀ ၁ ၈၈
၈(၃၂)	သင်ဆေးဖြတ်ရန်အတွက်အကူအညီ ပေး ကုသမှုမျိုး ရရှိခဲ့ဘူးပါသလား။	မရှိခဲ့ဘူးပါ။ ရှိခဲ့ဘူးပါသည်။ မဖြေပါ။	၀ ၁ ၈၈
၈(၃၃)	ဆေးဖြတ်ရန်(သို့)ဆေးလျော့ရန် အကူအညီရရှိလိုပါသလား။	မလိုပါ။ လိုပါသည်။ မဖြေပါ။	၀ ၁ ၈၈
၈(၃၄)	မူးယစ်ဆေးနှင့် ပတ်သက်ပြီးရဲ့ အဖမ်းခံ ခဲ့ရဘူးပါသလား။	မခံခဲ့ရပါ။ ခံခဲ့ရပါသည်။ မဖြေပါ။	၀ ၁ ၈၈
၈(၃၅)	မူးယစ်ဆေးနှင့်ပတ်သက်ပြီး အကျဉ်းချခံခဲ့ရဘူးပါသလား။	မခံခဲ့ရပါ။ ခံခဲ့ရပါသည်။ မဖြေပါ။	၀ ၁ ၈၈

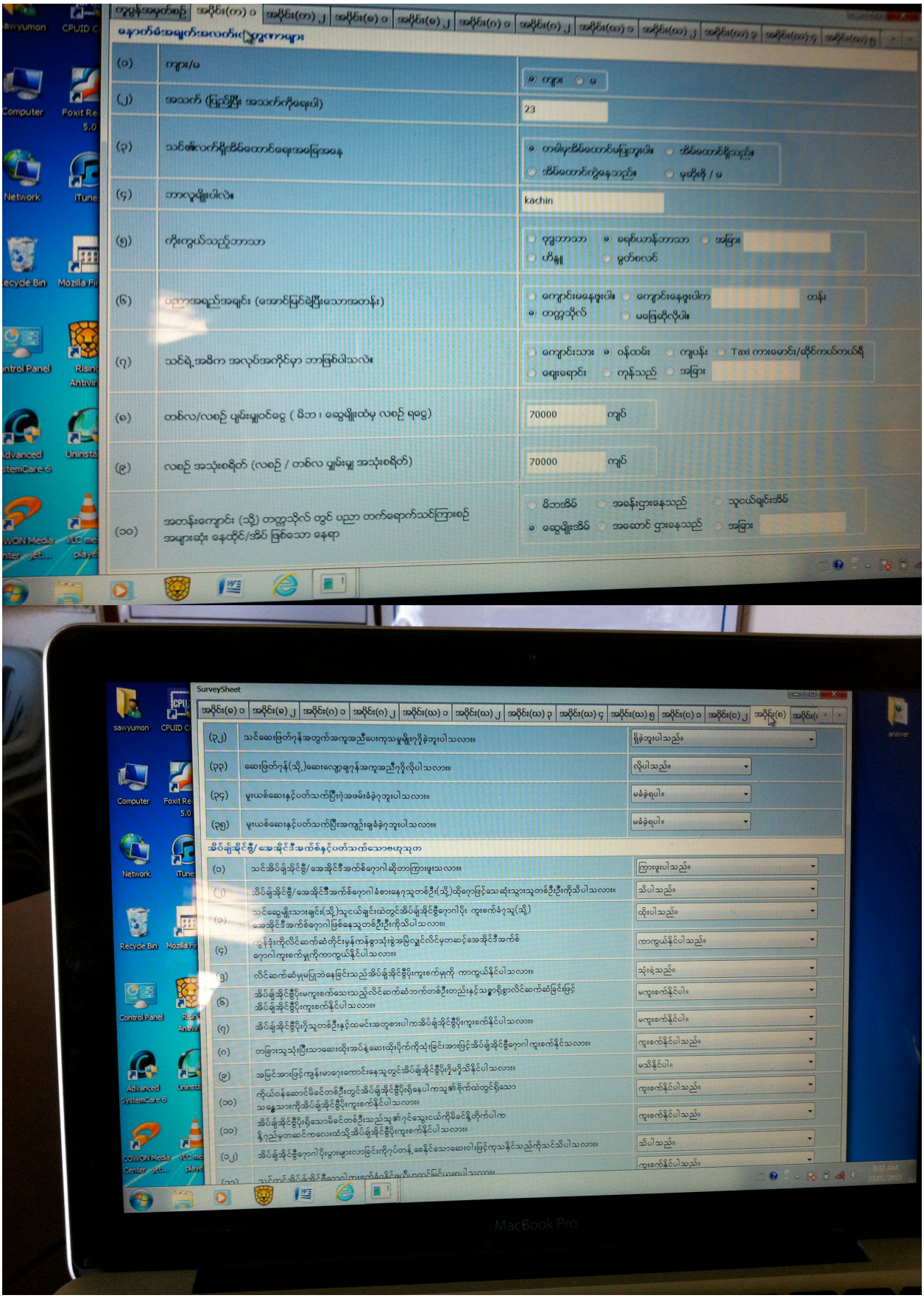
အပိုင်း(စ)အိပ်ရှိအိုင်ဗွီ ၊အေအိုင်ဒီအက်စ် နှင့် ပတ်သက်သော ဗဟုသုတ

အခုဆက်လက်ပြီး အိပ်ရှိအိုင်ဗွီ ၊အေအိုင်ဒီအက်စ် ကူးစက်ပုံ နှင့် ဆက်စပ်သော အကြောင်းအရာကို မေးမြန်းပါမည်။ ကြိုးစားပြီးမှတ်မိ သလောက်ဖြေကြားပေးစေလိုပါသည်။ဒီဖြေကြားချက်တွေကို လုံခြုံစွာ လျှို့ဝှက်ထားမှာ ဖြစ်ပါသည်။				
စ(၁)	သင်အိပ်ရှိအိုင်ဗွီ၊အေအိုင်ဒီအက်စ် ရောဂါဆိုတာ ကြားဖူးသလား။	မကြားဖူးပါ။ ကြားဖူးပါသည်။ မဖြေပါ။	၀ ၁ ၈၈	⇨ စ(၁၂)သို့
စ(၂)	အိပ်ရှိအိုင်ဗွီ၊အေအိုင်ဒီအက်စ်ရောဂါ ခံစားနေရသူတစ်ဦး(သို့)ဖြင့်သေဆုံးသွား သူတစ်ဦးဦး ကိုသိပါသလား။	မသိပါ။ သိပါသည်။ မဖြေပါ။	၀ ၁ ၈၈	
စ(၃)	သင်ဆွေမျိုးသားချင်း(သို့)သူငယ်ချင်းထဲ တွင်အိပ်ရှိအိုင်ဗွီရောဂါပိုးကူးစက်ခံရသူ(သို့)အေအိုင်ဒီအက်စ်ရောဂါဖြစ်နေသူ တစ်ဦးဦး ကိုသိပါသလား။	မသိပါ။ သိပါသည်။ မဖြေပါ။	၀ ၁ ၈၈	
စ(၄)	ကွန်ဒုံးကို လိင်ဆက်ဆံတိုင်း မှန်ကန်စွာ အမြဲသုံးစွဲ လျှင် လိင်မှတဆင့် အေအိုင်ဒီအက်စ်ရောဂါ ကူးစက်မှုကို ကာ ကွယ်နိုင်ပါသလား။	မကာကွယ်နိုင်ပါ။ ကာကွယ်နိုင်ပါစသည်။ မဖြေပါ။	၀ ၁ ၈၈	
စ(၅)	လိင်ဆက်ဆံမှု မပြုဘဲ နေခြင်းသည် အိပ်ရှိအိုင်ဗွီပိုးကူးစက်မှု ကိုကာကွယ် နိုင်ပါသလား။	မကာကွယ်နိုင်ပါ။ ကာကွယ်နိုင်ပါစသည်။ မဖြေပါ။	၀ ၁ ၈၈	
စ(၆)	အိပ်ရှိအိုင်ဗွီရောဂါပိုးမကူးစက်သေးသည့် လိင်ဆက်ဆံဘက်တစ်ဦးတည်းနှင့် သစ္စာရှိ စွာ လိင်ဆက်ဆံခြင်းဖြင့် အိပ်ရှိအိုင်ဗွီပိုးကူးစက်နိုင်ပါသလား။	မကူးစက်နိုင်ပါ။ ကူးစက်နိုင်ပါသည်။ မဖြေပါ။	၀ ၁ ၈၈	
စ(၇)	အိပ်ရှိအိုင်ဗွီပိုးရှိသူ တစ်ဦးနှင့်ထမင်း အတူစား ပါက အိပ်ရှိအိုင်ဗွီပိုး ကူးစက်နိုင်ပါသလား။	မကူးစက်နိုင်ပါ။ ကူးစက်နိုင်ပါသည်။ မဖြေပါ။	၀ ၁ ၈၈	
စ(၈)	တခြားသူသုံးပြီးသော ဆေးထိုးအပ်နဲ့ ဆေးထိုးပိုက်ကို သုံးခြင်း အားဖြင့်	မကူးစက်နိုင်ပါ။ ကူးစက်နိုင်ပါသည်။	၀ ၁	

	အိပ်ချိုအိုင်ဗွီပိုး ကူးစက်နိုင်ပါသလား။	မဖြေပါ။	၈၈	
စ(၉)	အမြင်အားဖြင့်ကျန်းမာရေးကောင်းနေသူတွင် အိပ်ချိုအိုင်ဗွီပိုး ရှိမရှိ သိနိုင်ပါသလား။	မသိနိုင်ပါ။ သိနိုင်ပါသည်။ မဖြေပါ။	၀ ၁ ၈၈	
စ(၁၀)	ကိုယ်ဝန်ဆောင်မိခင်တစ်ဦးတွင်အိပ်ချိုအိုင်ဗွီပိုးရှိနေပါကသူ၏ဗိုက်ထဲတွင်ရှိသောသန္ဓသား ကအိပ်ချိုအိုင်ဗွီပိုးကူးစက်နိုင်ပါသလား။	မကူးစက်နိုင်ပါ။ ကူးစက်နိုင်ပါသည်။ မဖြေပါ။	၀ ၁ ၈၈	
စ(၁၁)	အိပ်ချိုအိုင်ဗွီပိုးရှိသောမိခင် တစ်ဦး သည် သူ၏ရင်သွေးငယ်ကို မိခင်နို့တိုက်ပါကနို့ရည်မှတဆင့်ကလေးထံ သို့အိပ်ချိုအိုင်ဗွီပိုး ကူးစက်နိုင်ပါသလား။	မကူးစက်နိုင်ပါ။ ကူးစက်နိုင်ပါသည်။ မဖြေပါ။	၀ ၁ ၈၈	
စ(၁၂)	အိပ်ချိုအိုင်ဗွီရောပါပိုးမွှားများလာခြင်းကို ရပ်တန့်စေနိုင်သောဆေးဝါး ဖြင့်ကုသနိုင်သည်ကိုသင်သိပါသလား။	မသိနိုင်ပါ။ သိနိုင်ပါသည်။ မဖြေပါ။	၀ ၁ ၈၈	
စ(၁၃)	သင်တွင်အိပ်ချိုအိုင်ဗွီရောဂါ ကူးစက်ခံရနိုင်ဖွယ် ရှိဟု ထင်မြင်ယူဆပါသလား။	မကူးစက်နိုင်ပါ။ ကူးစက်နိုင်ပါသည်။ မဖြေပါ။	၀ ၁ ၈၈	

မေးခွန်းမေးမြန်းခြင်းများပြီးဆုံးပါပြီ။ယခုလိုအချိန်ပေးပြီးဂရုစိုက်စိတ်ရှည်သီးခံပြီးဖြေကြားပေးတဲ့ အတွက်အထူးကျေးဇူးတင်ပါသည်။

Appendix 10: Photo of computer-assisted self-interviewing (Myanmar)



Appendix 11: Photo of CASI interviewee

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Appendix 12: Photos of primary and secondary incentive

Primary incentive [approx. 2000 kyats (2.5 U$D)]

Secondary incentive [(a steel cup, lubricant gel, male and female condom); 900 Kyats (approx. 1.20 U$D)]

Appendix 13: Photos of methamphetamine users who used methamphetamine by inhaling