RISK BEHAVIORS AND UNPROTECTED SEX RELATED TO HIV/AIDS INFECTION AMONG MEN WHO HAVE SEX WITH MEN IN ANGIANG PROVINCE, VIETNAM

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ABSTRACT

Risk behaviors and unprotected sex were examined among men who have sex with men (MSM) (N=386) to support information for setting up a guideline to design an HIV/AIDS intervention program among this population in Angiang province, Vietnam. A cross-sectional method with time location sampling was used to collect data. Chi-square and logistic regression were used to identify selected risk factors and unprotected sex.

Results show that a majority of MSM was young and consistent condom use was low. Younger MSM used condoms more inconsistently with their male clients than older MSM. Lower educated MSM used condoms more inconsistently with female sex workers than higher educated MSM. Likewise, lower educated MSM were more likely to be injecting drug users than higher educated MSM. In contrast, higher educated MSM were more likely to drink alcohol and have sex when drunk, use more MDMA (Methylenedioxymethamphetamine) or both MDMA and injecting drugs, and share needles and syringes with drug use partners when compared to lower educated MSM. The key findings show that risk behaviors such as MDMA use and types of partners affect unprotected sex among MSM.

Recommendations suggest that the results of this study could be used as a MSM information database for policy makers and stakeholders to comprehensively understand the situation of MSM in Angiang province. These results can also be used to advocate HIV/AIDS policy, encourage more effective data to support harm reduction intervention programs among MSM in Angiang province.

KEY WORDS: MSM/RISK BEHAVIORS/UNPROTECTED SEX/ ANGIANG/VIETNAM

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LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
BCC	Behavior Change Communication
CDC	Centers for Disease Control and Prevention
FHI	Family Health International
HIV	Human Immunodeficiency Virus
IBBS	Integrated Biological and Behavioral Surveillance
MSM	Men who have sex with men
MDMA	Methylene-dioxy-methamphetamine
UIAI	Unprotected insertive anal intercourse
URAI	Unprotected receptive anal intercourse
MSW	Male sex worker
FSW	Female sex worker
KABP	Knowledge, Attitudes, Beliefs, and Practices
MARPs	Most-at-Risk Populations
M&E	Monitoring and Evaluation
MOH	Ministry of Health
HCMC	Hochiminh city
PIHCM	Pasteur Institute in Ho Chi Minh City
PLHIV	People Living with HIV
TLS	Time location sampling
STI	Sexual Transmitted Infection
STDs	Sexual Transmitted Diseases
UNAIDS	The United Nations Joint Program on HIV/AIDS
VAAC	Vietnam Administration of HIV/AIDS Control
WHO	World Health Organization

CHAPTER I
INTRODUCTION

This chapter introduces the problem statement, rationale of the study, research question, objective and the definition of the key words relevant to the study.

1.1 Problem statement

1.1.1 Common HIV/AIDS situation

In 1981, the first cases of acquired immunodeficiency syndrome (AIDS) in the United States were reported and the human immunodeficiency virus (HIV) has resulted in more than 65 million infections and 25 million deaths worldwide. The HIV epidemic has emerged as a difficult challenge to economic, political and social factors in every country in the world. At the end of 2008, the number of people living with HIV worldwide continued to grow reaching an estimated 33.4 million. The total number of PLWHIV in the same year was more than 20% higher than the number in 2000, and the prevalence was approximately three times higher than in 1990. In 2008, there were an estimated 2.7 million new HIV infections and it is estimated that 2 million have died due to AIDS-related illnesses worldwide in 2008. It indicates that globally the spread of HIV appears to have the highest number in 1996, when 3.5 million were newly infected. In 2008, the estimated number of new HIV infections was roughly 30% lower than at the epidemic's peak 12 years earlier (UNAIDS, 2009).

In 2008, there were an estimated 4.7 million people in Asia living with HIV, including 350,000 who were newly infected in 2007. Asia's epidemic peaked in the mid-1990s, and annual HIV incidence has declined subsequently by more than half. Since 2000, the epidemic has remained slightly stable in this region. In 2008, an estimated 330,000 AIDS-related deaths occurred in Asia, while the annual number of AIDS-related deaths in South and South-East Asia in 2008 was approximately 12% lower than the mortality peak in 2004. The rate of HIV-related mortality in East Asia

continues to increase, with the number of deaths in 2008 more than three times higher than in 2000 (UNAIDS, 2009).

Asia's epidemic has long been concentrated in specific populations, such as injecting drug users, sex workers and their clients, and men who have sex with men (MSM). However, the epidemic in many parts of Asia is steadily expanding into lower-risk populations through transmission to the sexual partners from specific populations. Additionally, Asia's epidemic has different transmission routes in different parts of the region. While injecting drug users and sex workers and their clients have accounted for most HIV infections, sexual transmission to drug users' partners and sex workers' clients is increasingly apparent. In addition, MSM and transgender people are documented to have exceptionally high transmission rates (UNAIDS, 2009).

1.1.2 HIV/AIDS situation in Vietnam

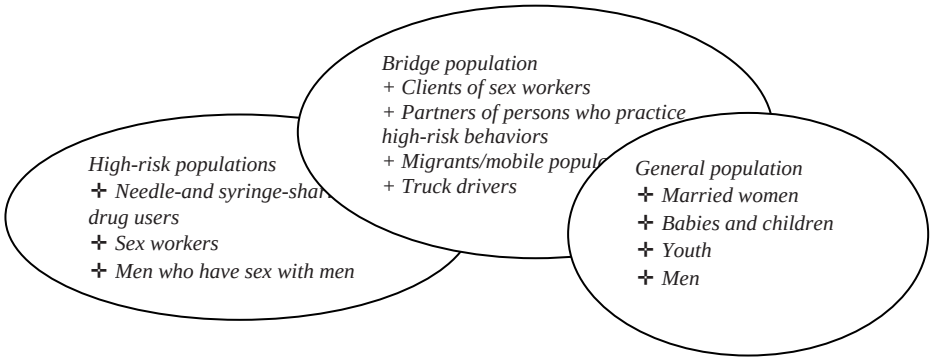
Although Vietnam is less affected by HIV/AIDS than other countries in Asia and is classified as having a concentrated epidemic, it is now facing the possibility of a growing epidemic, especially among high-risk populations. The number of HIV cases has been steadily increasing since the first case of HIV was detected in 1990 and now all provinces have reported cases of HIV. In 1992, an estimated 3,000 people living with HIV were reported and by 2000 the number had grown to over 120,000. Four years later, this number doubled to 241,000 (HIV/AIDS in Vietnam – Hanoi 2006). Data accumulated by the end of March, 2009 showed that there were 186,930 HIV cases, of which there were 73,443 cases of AIDS and 42,447 deaths by illness related to AIDS. Although the number is increasing, Vietnam is still at an early enough stage to prevent further expansion of the epidemic.

1.1.3 Spread of HIV in Vietnam

HIV spreads from high-risk groups, such as sex workers, to a "bridge" population such as their clients. Other "bridge" populations include the partners of sex-worker clients, injecting drug users, and other people who practice risky behaviors, namely, migrant or mobile populations; and truck drivers. In Vietnam, the rising number of cases among pregnant women and their infants provides evidence

that HIV is spreading to the general population (HIV/AIDS in Vietnam – Hanoi, 2006).

Figure 1: HIV transmission model of high risk – general population in Asia and Vietnam



1.2 Rationale of the study

In theory, anyone could become infected with HIV, but in reality, a transmission of the disease is highly dependent upon some factors. The United Nations has summarized the social and behavioral risk factors including: (1) little or no condom use; (2) large proportion of the adult population with multiple partners; (3) overlapping sexual partnerships – individuals are highly infectious when they first acquire HIV and are thus more likely to infect any concurrent partners; (4) large sexual networks (often seen in individuals who move back and forth between home and a far-off workplace); (5) age mixing, typically between older men and young women or girls; and (6) women's economic dependence on marriage or prostitution (UNAIDS/WHO, 2000).

Biological risk factors include: (1) high rates of sexually transmitted infections, especially those causing genital ulcers; (2) low rates of male circumcision; and (3) high virus load – HIV levels in the bloodstream are typically highest when a person is first infected and again in the late stages of illness (The AIDS Infonet, 2009).

1.2.1 MSM and HIV prevalence

The behavioral category men who have sex with men has been used in HIV literature since at least 1990 by epidemiologists in order to study the spread of disease among men who have sex with men, regardless of identity. The acronym

MSM, coined in 1994, signaled the crystallization of a new concept (Young et al., 2004).

Men who have sex with men in Asia face nearly one in five odds (18.7%) of being infected with HIV (Baral et al., 2007). In a region where overall HIV prevalence is low, high levels of infection among men who have sex with men have been reported in numerous locations—29.3% in Myanmar in 2008, 30.7% in Bangkok, 12.5% in Chongqing, China, between 7.6% and 18.1% in a study of over 4500 self-identified men who have sex with men in southern India and between 4% and 32.8% in sentinel surveillance in 16 cities in India in 2006, 5.6% in Vientiane, Laos and 5.2% nationally in Indonesia (UNAIDS, 2009).

In Vietnam, there is no program of surveillance or routine testing to follow the prevalence of HIV infection in MSM over time, little is known about the HIV prevalence among MSM. HIV prevalence among MSM was 5% in Hochiminh city and 9% in Hanoi, but this is not a statistically significant difference (IBBS, 2006) and a survey of 208 MSM who came to the Pasteur Institute in Hochiminh city for voluntary testing in 2000 and 2002 found an HIV prevalence of 5.8% and 5.6% of 72 MSM tested positive for HIV respectively. It is clear that significant populations of MSM living in major cities have behaviors putting them at high risk of HIV infection. With more information and support, MSM would be better able to understand their risks and to protect themselves from HIV (Colby, 2004).

1.2.2 MSM and drug use

Like other most at risk populations, drug injection among MSM is one risk factor for HIV infection. Up to now, there are but a few descriptive surveys of drug use data in Vietnam in general or in Angiang province in particular. Data has begun to provide proof of increasing drug use among MSM in Vietnam with fewer than 2% of MSM admitting to using intravenous drugs in 2001 in Hochiminh city, 9.2% in Hanoi and 3.8% in Hochiminh city in 2005 (IBBS, 2006).

1.2.3 Prevention program among MSM

"Fewer than one in 20 men who have sex with men have access to the HIV prevention, treatment and care services they need" (UNAIDS, 2006). Now epidemiologists cannot predict with certainty how fast a given epidemic will expand and when it will peak, although short-term predictions can be made on the basis of HIV trends and information on risk behavior. Fortunately, there is strong evidence showing that countries will ultimately reduce their new infections if they carry out effective prevention programs encouraging abstinence, fidelity and safer sex. A crucial factor is promoting condoms, both the traditional kind and the female condom, and making good quality condoms cheaply and conveniently available. Condoms are protective irrespective of the age or mobility of the partners, the scope of their sexual networks, or the presence of another sexually transmitted infection (UNAIDS, 2000)

Prevention coverage for men who have sex with men remains extremely low in Asia (Commission on AIDS in Asia, 2008). However, recent experience demonstrates the feasibility of scaling up prevention services for this population. The Avahan India AIDS Initiative and government officials report that near universal coverage for HIV prevention services has been achieved for men who have sex with men in Andhra Pradesh, Karnataka and Maharashtra states in India (Bill & Melinda Gates Foundation, 2008). China has also launched a national effort to reach men who have sex with men with HIV prevention services, supporting and partnering with community organizations. However, substantial additional progress is required in order to address the prevention needs of this population, as China estimated that as of late 2007 it had achieved HIV prevention coverage for about 8% of men who have sex with men (State Council AIDS Working Committee Office & UN Theme Group on AIDS, 2008). Despite of the HIV epidemic among MSM in Vietnam being introduced as a part of HIV prevention strategies in recent years, intervention programs have been conducted and Monitoring and Evaluation system in HIV/AIDS control and prevention put in place, the program still does not get comprehensive quality data.

In many countries, it is recognized that MSM may be vulnerable to HIV and other sexually transmitted infections. Although limited to a few surveys, the available data on MSM in Vietnam show that they are at increased risk of HIV

infections due to high numbers of sexual partners, high rates of unsafe sex, and inconsistent condom use (HIV/AIDS in Vietnam – Hanoi 2006).

MSM is also a MARP in Vietnam who remains largely invisible and marginalized; although there have been some studies on the MSM population in Hanoi, Hochiminh city (IBBS, 2006) and Khanhhoa province (Colby, 2005). These studies stressed the need for detailed information on socio-demographic characteristics, the rate of HIV and knowledge, attitude and risk behaviors among the MSM population. However there's not any focus on factors affecting inconsistent condom use among MSM in those studies. Therefore, there is a need for research on MSM in the Mekong river delta area to evaluate the trends in risk behaviors related to HIV in which the interaction between drug use and sexual behavior are analyzed, the base for intervention programs to increase consistent condom use among this group.

1.3 Research question

1.3.1 What are the characteristics of MSM in Angiang province?

1.3.2 Do selected risk behaviors relate to unprotected sex among MSM in Angiang province?

1.4 Objective

1.4.1 Ultimate objective

Support the information for setting up a guideline to design HIV/AIDS intervention program for MSM in Angiang province, Vietnam.

1.4.2 Immediate objective

1. To describe the characteristics, selected risk behaviors and unprotected sex among MSM in Angiang province.

2. To determine the relationship between risk behaviors related to HIV infection and unprotected sex among MSM in Angiang province.

3. To recommend further researches and HIV intervention and prevention programs for MSM in Angiang province.

1.5 Definition

1.5.1 Men have sex with men

The term “men who have sex with men” - frequently shortened to MSM - describes a behavior rather than a specific group of people. It includes self-identified gay, bisexual, or heterosexual men, many of whom may not consider themselves gay or bisexual. HIV responses for transgender populations are also often considered alongside MSM initiatives. MSM in this study refers to men who have engaged in sexual intercourse such as by hand, oral sex and anal sex with other men during last 12 month (at the time of survey). It is divided into 2 groups; younger MSM aged under 20 years old and older MSM aged 20 years old and over.

1.5.2 Risk behaviors related to HIV infection

It refers to the practice of high-risk behaviors among MSM which can be put them at risk for HIV transmission. This study chooses drug use, alcohol use and sexual experiences such as type of partners during the last three months, number of partners during the last three months and sexual preferences or sex act during the last 12 months as the selected risk behaviors.

1.5.3 Unprotected sex

Unprotected sex is determined as inconsistent condom use when condom use is considered as a risk-reduction behavior. Inconsistent condom used in this study refers to MSM who are using most of the time, sometimes and never used condom when they have engaged in sexual intercourse with other men.

CHAPTER II
LITERATURE REVIEW

This chapter reviews theoretical perspectives and previous studies about MSM regarding to risk perception, risky behaviors and perception of risk, sexual orientation and gender identity, risk of HIV infection, sexual behavior among MSM and unprotected sex, drug and alcohol use and sexual behaviors and experiences, along with personal factors

2.1 Risk perception

An overall description of people's perceptions of HIV risk is important in understanding how people relate their sexual experiences to the risk of disease infection. Perceived risk of getting AIDS may have important implications for health if the perceptions are rational and lead to a willingness to avoid risky behavior. In addition, an understanding of the association between perception of risk and sexual behavior may facilitate the design of AIDS preventive measures necessary to check the spread of the disease among different population subgroups (Priscilla et al., 2003)

Risk has been defined in a number of ways, but it is often seen as the likelihood that an individual will experience the effect of danger (Short Jr., 1984). Risk perception is the subjective assessment of the probability of a specified type of incident happening and how concerned we are with the consequences. To perceive risk includes evaluations of the probability as well as the consequences of a negative outcome. Perception of risk goes beyond the individual, and it is a social and cultural construct reflecting values, symbols, history and ideology (Weinstein., 1980).

In conclusion, the individual subjective state of willingness to prevent and control measures is determined by an individual's perceptions, likelihood of susceptibility to STIs and the probable severity of the consequences contracting HIV/AIDS. The concept of perceived risk refers to a general assessment of one's risk to the health hazard and distinct from beliefs about the consequences of condom use.

The belief that using a condom could prevent STIs/HIV infection will encourage to using condom.

2.2 Risky behaviors and perception of risk:

The age of a person is an important factor that may influence sexual behavior and the level of perceived risk of HIV infection. Men and women in their teens are at increased risk of HIV infection because they often engage in unprotected sexual intercourse (Hulton et al., 2000). Unless the first intercourse is also the start of a mutually monogamous relationship, early age at first sexual intercourse is associated with a long period of exposure to sexual activity, a higher propensity to accumulate sexual partners, and increase chances of contacting sexually transmitted diseases (Dixon-Muller and Wasserheit, 1990).

The study (Mohammad et al., 2006) conducted in Iran on adolescent males noted that 28% of the study population reported having engaged in sexual activity. Sexual experience was associated with older age, access to satellite television, alcohol consumption and permissive attitudes towards sex. Substantial proportions of respondents held misconceptions regarding condoms, STIs and reproductive physiology. Attitudes towards premarital sex were more permissive among respondents who were older, were not in school, had work experience, had access to the internet or satellite television, lived separately from their parents, or reported having used alcohol, cigarettes or drugs.

Another study (Manju et al., 2003) pointed that most young men (83%) had received direct encouragement from at least one person in the last year to engage in premarital sex. Men perceived themselves to have a higher risk of unplanned and unprotected sex than did women. In contrast, women held more negative attitudes toward premarital sex and were more often discouraged by parents or siblings from engaging in sex.

In conclusion, age, gender, age at first intercourse, society, family relationship and peer group are factors influencing perception of risk which leads to risky behavior practices. Practicing risky behaviors is an important motivating factor to be vulnerable to HIV infection.

2.3 Sexual orientation and gender identity

The two largest sex differences in behavior between men and women are sexual orientation and gender identity. Sexual orientation refers to the direction of sexual attraction to the same or other sex/gender. Gender identity refers to people's inner sense of maleness or femaleness. Although these phenomena are a fundamental part of human life, their underlying mechanisms remain poorly understood. The dominant theory is that prenatal hormones of gonadal origin play a major role in both sexual orientation and gender identity. However, a review of the evidence shows that hormones fail to explain either of these traits in the vast majority of humans. (Sanchez et al., 2009).

Homosexual activity has been universal throughout history but its name was coined not earlier than 1869 by Kertbeny. Unfortunately, there is not yet a conclusive study that tells us exactly what causes homosexuality. Strong support was obtained for the hypothesis that sexual orientation relates primarily to erotic fantasy orientation. These latter results support a 2-dimensional model of sexual orientation in which homosexuality and heterosexuality are treated as separate, independent factors (Storms et al., 1980).

The overwhelming majority of biomedical studies into homosexuality have searched for signs and symptoms of biological femaleness in homosexual men and biological maleness in homosexual women. Some studies (digit ratios, fraternal birth order, abnormal hormonal milieu in prenatal life, and brain structure) have indeed found statistically significant associations but the results fail to provide a comprehensive explanation as to why some people are attracted to members of the same sex, and the majority not (Gooren et al., 2009).

In conclusion, sexual orientation and gender identity are two opposite issues in the one individual, when sexual orientation refers to sexual attraction to the same or other sex, in which homosexual and heterosexual are two main types of sexual orientation; in the other hand, gender identity refers to inner sense of gender. Understanding why someone are homosexual or heterosexual orientation failed from previous studies, despite there were many given hypothesis.

2.4 Risk of HIV infection

On average, each time a monogamous, heterosexual couple in which one partner is HIV-positive has intercourse, the probability that the virus will be transmitted to the uninfected partner is 0.11%, according to an analysis of data from rural Rakai, Uganda (Gray et al., 2001).

The risk of transmission climbed sharply and steadily as viral load increased, compared with men and women whose viral load was less than 1,700 copies per mL, those with a viral load of 1,700-12,499 copies per mL were 16 times as likely to transmit the virus (rate ratio, 16.1). The rate ratio rose to 27.7 for individuals with a viral load of more than 38,500 copies per mL. An infected individual with genital ulcer disease was at increased risk of transmitting the virus (2.6 times), but no other STD-related factors were associated with the risk (DIGESTS, 2001). So if the risk is 1 in 100 for example, it doesn't mean that one can engage in that activity 99 times without any risk of becoming infected. One might become infected with HIV after a single exposure and can happen the first time one engage in a risky activity.

The highest risk of becoming infected with HIV is from sharing needles to inject drugs with someone who is infected with HIV. When you share needles, there is a very high probability that someone else's blood will be injected into your bloodstream. The next greatest risk for HIV infection is from unprotected sexual intercourse (without a condom) but receptive anal intercourse carries the highest risk. The lining of the rectum is very thin and is damaged very easily during sexual activity and makes it easier for HIV to enter the body. The "top" or active partner in anal intercourse seems to run a much lower risk. Receptive vaginal intercourse has the next highest risk. The lining of the vagina is stronger than in the rectum, but is vulnerable to infection. The risk is higher for the receptive partner. However, there is some risk for the active partner in anal and vaginal sex. It's possible for HIV to enter the penis through any open sores, through the moist lining of the opening of the penis, or through the cells in the mucous membrane in the foreskin or the head of the penis (The AIDS Infonet, 2009)

The proper and consistent use of latex or polyurethane (a type of plastic) condoms when engaging in sexual intercourse—vaginal, anal, or oral—can greatly reduce a person's risk of acquiring or transmitting sexually transmitted diseases,

including HIV infection. For condoms to provide maximum protection, they must be used consistently (every time) and correctly (CDC, 1999).

2.5 Sexual behavior among MSM and unprotected sex:

In 1981, members of the Gay Association had a mean annual number of partners of 8-12, and 72% had unprotected receptive anal intercourse (Ebbesen., 1984). In a study conducted in 1988, the number of partners was 3.5, and 33.7% had had unprotected receptive anal intercourse. This finding suggests that gay Danish men may have modified their sexual behavior (Linn et al., 1989; McKusick et al., 1990; Ekstrand et al., 1990 and Joseph et al., 1990)

Reported condom use among MSM is low (Ma et al., 2007; Mansergh et al., 2006). In a survey in the Lao People's Democratic Republic, for example, fewer than one in four MSM reported consistent condom use with non-regular partners (Sheridan et al., 2009). Condom use often depended on the person MSM had sex with. Some will use condoms with clients (if they were sex workers) but never with their wives or girlfriends or other regular partners. One interviewee reported having had unprotected sex with someone known to be HIV positive believing it to be safe if they do not climax, and another admitted to not always using condoms even though he knows he is HIV positive. Other interviewee said he used condoms with men but not with women (Parry et al., 2008).

A study from England about condom use in which men were asked about sexual behavior in the last month showed that 31% reported passive anal sex, 19% had passive anal sex without using a condom, 32% reported active anal sex of whom 18% had active anal sex without using a condom (Dawson et al., 1991).

A behavioral survey, conducted in 2001, in HCMC among 219 MSM revealed that the mean number of sexual partners was 3.3 in the previous month and 14.8 in the previous year. Only 32% used condoms during their last intercourse and only 40% used a condom when their last intercourse included anal sex. A lack of sanctioned male-male relationships contributes to high number of sexual partners, with 81% reported sex with non-regular male partners and 22% also having sex with women in the past year. Just over half (55%) of these respondents reported using a

condom the last time they had anal intercourse with a non-regular male partner (Colby., 2003)

2.6 Drug and alcohol use and sexual behaviors:

Drug and alcohol use were in step with low levels of consistent condom use, collectively raising concerns for a growing epidemic among MSM (Dolezal et al., 2000, Sheridan et al., 2009)

Substance use was not predictive of condom use within the men's primary relationships, but it was associated with more unprotected sex with other, primarily “casual” partners (Dolezal et al., 2000). Drug use was positively associated with unprotected anal sex, particularly with casual partners. Among men who engaged in both unprotected and protected anal sex, substance use was not more common on unprotected occasions than on protected occasions (Dolezal et al., 2000).

More than 20% of MSM reported drug use, with 9.2% in Hanoi and 3.8% in HCMC reporting ever injecting drugs. HIV prevalence among injecting MSM was much higher than that among non-injecting MSM. This suggests that drug injection may play an important role in driving the HIV epidemic in the MSM population (IBBS, 2006)

Men who engaged in transmission risk behavior (UIAI or URAI) with casual partners were more likely than men who did not engage in such behavior to have used various substances. Users of certain drugs were specifically less likely to use condoms with HIV-negative or unknown status partners than users. Of men who used drugs, those who used more frequently before or during sex were more likely to engage in URAI with casual partners (Purcell et al., 2001).

2.6.1 Injecting drug use and sexual behavior:

Injection risk practices is quite high in a study were 45% of injection meth users reported sharing needles with other users during the past 2 months. And 18% indicated that they had shared needles without cleaning them and approximately half of the sample (53%) used bleach to clean needles whereas 64% used water for this purpose (Semple et al., 2004).

Needle sharing among injecting MSM was not uncommon with 13.16% of injecting MSM in HCMC and 67.1% in Hanoi reporting that they had shared needles in the past. Like unprotected sex, sharing needles will increase the risk of acquiring HIV or spreading HIV to others (Colby et al., 2004)

2.6.2 Non-injecting drug use and sexual behavior:

George E. Woody found that hallucinogens, stimulants and inhalants are independently associated with higher sexual risk and implied that stopping or reducing problematic non-injecting drug or alcohol use is associated with a reduction in sexual risk (Woody et al., 1999).

Research over the past 10 years has suggested that methamphetamine use has become a significant problem and is associated with risky sexual behaviors among gay and bisexual men (Parsons et al., 2007).

Methylenedioxymethamphetamine (MDMA), commonly known as Ecstasy, is a stimulant drug that is chemically related to mescaline and amphetamine and is used illicitly for its euphoric and hallucinogenic effects. It was formerly used in psychotherapy but in 1985 it was declared illegal in the United States. MDMA users were found to have had more male partners and to have unprotected anal sex with a male. MDMA users thus constitute a group at risk for sexually transmitted diseases, including HIV, and other associated problems (Klitzman et al., 2002).

2.7 Sexual experiences:

Almost two thirds of respondents reported having anal intercourse with at least one partner in the past week. Within the past month, 89% of respondents reported anal sex with at least one partner. Respondents were asked what role they typically played during anal intercourse with other men. Over half engage in both UIAI and URAI, and 28% reported usually being insertive partners and 16% reported usually being receptive partners (Onyango-Ouma et al., 2005).

Studies in China, Thailand and Vietnam have also found that many MSM have multiple sex partners (de Lind van Wijngaarden et al., 2009; Ruan et al., 2009; Ruan et al., 2008). Within the past month, 47% of respondents reported having two or more partners, while 79% reported having two or more partners within the past year.

The median number of partners in the past year was three. In addition there is a substantial subgroup (21%) that reported having only one partner in the previous year (Onyango-Ouma et al., 2005).

Having a steady partner had been the most important factor associated with unsafe sex. This finding is in accordance with a number of recent studies among different groups of homosexual men (Schechter et al., 1988; McKusick et al., 1990; Valdiserri et al., 1988; Fitzpatrick et al., 1989 and Van Griensven et al., 1989). Furthermore, by taking into account the HIV status of the partners, the present study shows that the association between unsafe sex and having a steady partner cannot be explained by unprotected anal intercourse taking place among concordant partners (Schmidt et al., 1992).

Surveys indicate that a considerable proportion of Asian MSM also have sex with women (Sheridan et al., 2009). Recently, a number of studies have focused on epidemiological and behavioral differences between men who have sex only with other men, and those who have sex with both men and women. In Bangkok, men who have sex only with other men are more than 2.5 times more likely to be HIV-infected than men who have sex with both men and women (Li et al., 2009).

2.8 Personal factors:

MDMA users were found to be younger, less educated, to have had more male partners, more one night stands with men and to have unprotected anal sex with a male (Klitzman et al., 2002, Sheridan et al., 2009)

Among men without a steady partner the frequency of unsafe sex increased with number of partners and decreased with age (Schmidt et al., 1992).

Respondents were from diverse socioeconomic backgrounds, ranging from the unemployed to educated professionals. Respondents who had no occupation (15%), students (21%), and sex workers (14%) were the easiest employment subgroups to classify. The remaining 50% of respondents reported a wide variety of professions, jobs, and activities by which they earned income. (Onyango-Ouma et al., 2005)

MDMA users (i.e. those who used it in the past 6 months), as compared with non-users, were younger (when comparing each decade of age with the oldest

reference group, and also when using each of the other age groups as reference groups), were less educated, were more likely to have unprotected insertive and receptive anal intercourse with a male partner, were more likely to report high number of male partners and had more one night stands with men (Klitzman et al., 2002).

Similarly, this study also found that a positive gay identity, as measured by gay community affiliation and participation, as well as self-identification and being 'out', were directly related to HIV risk behaviors and indirectly related to HIV risk behaviors through substance use (Relf et al., 2004). Moreover, consistent condom use with male partners was higher among bisexual (77.6%) than MSM-only (62.9%) (Li et al., 2009)

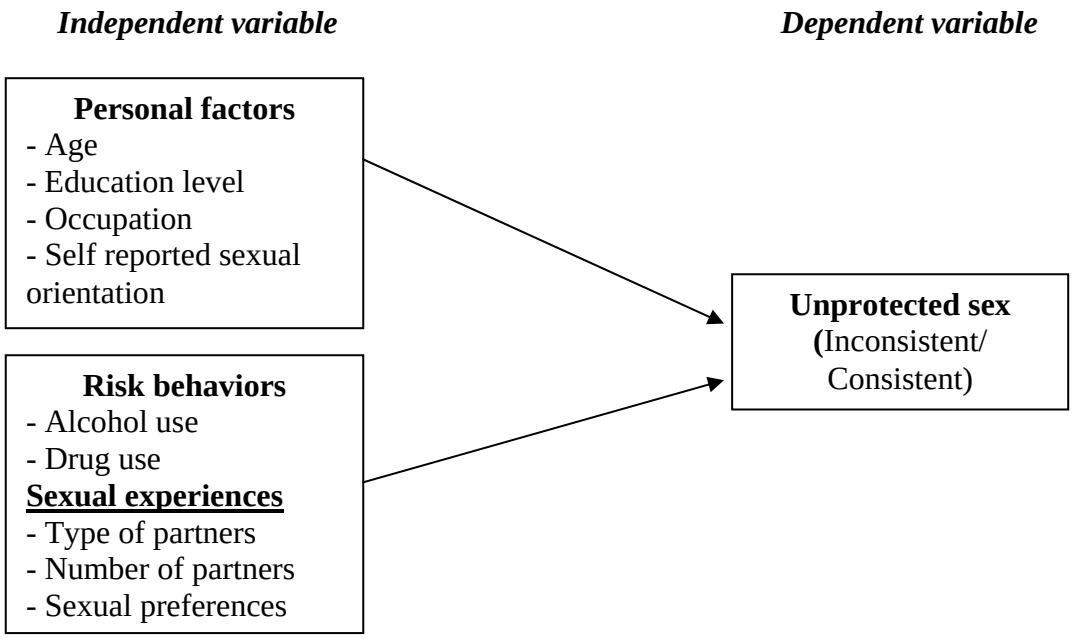
2.9 Conceptual framework:

After reviewing literature, the conceptual framework has been drawn with some limitations. In this study, causal relationship can be tested because there are some studies supporting for the effect of sexual behavior to drug use; however, this study only considers the effect of drug use to sexual behavior.

Dependent variable regards the unprotected sex in which a pattern, inconsistent condom use, is considered in this study. Inconsistent condom use is defined as whether the respondents used condom every time in having sex during the last three months.

Personal factors and risk behaviors are two sets of independent variable. Personal factors are the individual characteristics of respondent, which include age, education level, occupation and self reported sexual orientation. Risk behaviors refer to drug and alcohol use and sexual experiences (number of partners, type of partners and sexual preferences).

Figure 2: Conceptual framework



2.10 Hypothesis:

This study has two hypotheses:

2.10.1 Risk behavior is associated with unprotected sex (inconsistent condom use among MSM group).

2.10.2 MSM who are using drug are more likely to practice condom use inconsistently than MSM who are not using drug.

CHAPTER III
RESEARCH METHODOLOGY

Detailed information related to the study design and methodology is described in this chapter.

3.1 Study design

This study come from a cross sectional study on Knowledge, Attitudes, Beliefs , and Practices (KABP) among MSM in Angiang province, which was the baseline survey for the Vietnam HIV/AIDS Prevention Project funded by the World Bank. The survey was conducted by the Pasteur Institute in Hochiminh city and the provincial Project Management Unit of Angiang province, during October and December 2009.

3.2 The study area

Angiang is located in the west of the Mekong Delta, Southern of Vietnam, between the Tiengiang and Haugiang rivers and shares a 95-kilometer border with Cambodia. It is next to the Cuulong river and consists of a few midland areas and low mountains. The main ethnic groups found in the province are the Kinh, Khmer, Cham, and Hoa.

Angiang is crisscrossed by many rivers and canals which make a convenient water transport system. The two tributaries of the Mekong river, namely the Tien and the Hau, run across the province. They deliver millions of cubic meters of alluvium annually to the region. As a result, the deposits have formed several islets which are extremely fertile and covered with lush green vegetation. Estimated average yearly income per capita is around US$800.

3.3 Research instrument

The national guidelines (MOH, 2007) for data collection on MSM and structured questionnaire were used for gathering information from MSM, including the collection of venous blood samples simultaneously for HIV/STI testing.

The questionnaire elicited information on demographic characteristics (age, get married with women, educational level, occupation, self-reported sexual orientation), type of partner and sexual behaviors (the number of male and female sexual partners in the previous months and during last 12 months frequency of anal and vaginal sex in previous six months, condom use during anal sex, commercial sex (exchanging sex for money or exchanging money for sex), using condom and lubricant, sexual transmitted diseases (lifetime history of sexually transmitted diseases), alcohol drinking and drug use (injecting drug use), knowledge and attitudes to HIV/AIDS and HIV test history and approach to interventions.

3.4 Sample design and size

This sampling procedure in primary study used a probability sampling method, Time Location Sampling.

Steps for Time Location Sampling:

1. Create a “map” of all the possible places the MSM population can be found.

2. Randomly select venues as proxies. Potential MSM respondents were approached by trained peer recruiters randomly and systematically.

3. A criterion of MSM in this survey is men who have had sex by hand, anal or oral with other men during last 12 months.

Sample size: 386 MSM in communities who live in Angiang province had been recruited for this survey.

3.5 Operational definition of variable

3.5.1 Dependent variables

Unprotected sex is defined as the inconsistent condom use among MSM who did not use a condom every time when they had sex with a partner. The unprotected sex covered practice of MSM who did not use a condom every time when they had anal, oral, or vaginal sex with HIV-negative, HIV-positive, or unknown sero-status partners.

3.5.2 Independent variable

3.5.2.1 Sexual experiences include number of partners, type of partners and sexual preferences.

Number of partners refers to the total number of partner during last three month, which is classified into two categories: one partner and more than one partner.

Type of partners is defined as two categories: male partner-only and both types of partners (male and female partners). Male partner included MSW, MSWs' client and consensual male partners, and female partner included FSW, FSWs' client and consensual female partners.

Sexual preferences is classified into four categories: receptive anal sex (i.e. "partner inserted his penis into other's anus"); insertive anal sex (i.e. "one inserted his penis into the anus of partner"), both receptive and insertive anal sex, and no anal sex with male

3.5.2.2 Drug use refers to MSM who have ever used one or both method of non-injecting drug use(Methylenedioxymethamphetamine: MDMA) and injecting drug use. Non-injecting drug use (MDMA) is a method of using drug through drinking, smoking or snorting, and injecting drug use is a method of introducing the drug into the body with a hollow needle and a syringe which is pierced through skin.

Drug use is divided into four categories: non-drug use, MDMA use only, injecting drug use only, and both methods of drug use.

Table 3.1 Operational definitions and measurement of variable

Variable	**Operational definition**	**Level of measurement**
Dependent variable		
Unprotected sex	Action of MSM who has sexual intercourse in every type of sex acts and not using condom in every times during the last 12 months	*Nominal* 0 = consistent 1 = inconsistent
Independent variable		
Age	Number of year which MSM lived at the time of survey which is recode by two groups	*Ordinal* 0 = <20 years old 1 = 20 and over
Education level	The highest level of education they have graduated by the time of survey	*Ordinal* 0 = Lower education 1 = Higher education
Occupation	Occupation characteristic which is related to occupation sectors of MSM	*Nominal* 0 = Currently unemployed sector 1 = Entertainment sector 2 = Business sector
Self-reported sexual orientation	The direction of one's sexual interest toward members of the same, or both sexes	*Nominal* 0 = Bisexual 1 = Homosexual 2 = Heterosexual
Drug use	MSM who have ever or never used drugs with one or both of two methods: non-injecting drug (MDMA) and injecting drug.	*Nominal* 0 = non-drug use 1 = MDMA use only 2 = injecting drug use only 3 = both methods of drug use
Alcohol use	Whether MSM have ever drunk or not	*Nominal* 0 = No 1 = Yes
Type of partners	Type of sexual partners during the last three months	*Nominal* 0 = male partners only 1 = both male and female partners
Number of partner	The number of partner during last three month	*Nominal* 0 = more than one partner 1 = one partner
Sexual preferences	Refer to their preferences of sex act during last 12 months	*Nominal* 0 = insertive anal sex 1 = receptive anal sex 2 = both receptive and insertive anal sex 3 = no anal sex with male

3.5.2.3 Alcohol use is defined as MSM who have ever drunk alcohol or not. It is divided into two categories: have ever drunk and have never drunk

3.5.2.4 Age of respondents is classified into two categories in statistic analysis. The first category, younger age, consists of the respondents who have age less than 20 years old. The second category is respondent aged 20 years and higher.

3.5.2.5 Educational level is classified as two categories in statistic analysis. The first category is lower education. It consists of the respondents who are graduated primary education or lower. The second category is higher education. It covers respondent who is graduated primary education or higher

3.5.2.6 Occupation is classified as three categories. The first category is currently unemployed sector. It includes currently unemployed person, students and pupils. The second category is entertainment sector. It includes entertainment employee, sex worker, hairdresser and singer. The third category is business sector. It consists of self employment, sales/office clerks, government employee, farmer and worker.

3.5.2.7 Self-reported sexual orientation is classified into 3 categories: homosexual, bisexual and heterosexual.

3.6 Analysis

The data was analyzed using statistical package in social science (SPSS/PC+). Univariate and bivariate analysis was used to describe personal factors, selected risk behaviors and unprotected sex of the respondents. Nonparametric test (χ^2) was used to test the relationship between risk behaviors and unprotected sex. A binary logistic regression was used to examine the effect risk behaviors and other factors on unprotected sex.

3.7 Ethical aspects

All participants participated anonymously, voluntarily, and willingly in the survey. The written informed consent was recommended but the verbal was used as a substitute if participants disagreed to provide the written consent (most participants provided verbal consent). The men who were eligible and willing to participate were then interviewed by a health professional with a standard questionnaire.

3.8 Limitation

This is a cross-sectional study, and thus does not provide information about trends. Finally, as always, when dealing with sensitive topics, there may be significant under-reporting due to social desirability bias; however, participants were recruited through known MSM organizations and through MSM friends and colleagues, which should have reduced the level of social desirability bias.

CHAPTER IV
RESULTS AND DISCUSSION

This chapter consists of four sections. The first section describes the frequency of general and selected characteristics of MSM. The second section describes the distribution of age group and education level by other factors and condom use by selected risk behaviors. The third section reveals the relationship between selected risk behaviors and unprotected sex, controlled for other factors. The results of the analyses of this study are discussed in the forth section.

4.1 Univariate analysis

This section describes the characteristics, selected risk behaviors and unprotected sex among MSM in Angiang province.

4.1.1 Characteristics of MSM in Angiang Province

The characteristics is divided into two categories, the first category is called ‘General characteristics of MSM’ in Angiang province. The second category is called ‘Selected characteristics of MSM’ in Angiang province. These characteristic are examined to support the MSM information database in Angiang province.

4.1.1.1 General Characteristics of MSM in Angiang Province

Table 4-1 reveals socio-demographic characteristics for 386 MSM who participated in this study. On average, this was a young group with a median age of 20, although age was ranged from 14 to 50. 43% of MSM were adolescent, followed by youth (30%) and the rest were adult. MSM in this study had low education levels, 75% of them attended lower than high school education which included 38% with secondary school, 28% with primary education and 8% never attending school. The remainder of the sample, 22% of them attended high school education and only 3% had been educated at college or university.

Table 4-1 Distribution of general characteristics among MSM in Angiang province

Personal factor	**Frequency N=386**	**Percent (%)**
Age group		
14-19 yrs	165	42.9
20-24	114	29.6
25-34	82	21.3
35-50	24	6.3
Total	385*	100.0
Mean = 22.3; Median = 20.0; Min = 14; Max = 50; SD = 6.2		
Education		
Illiterate	30	7.8
Writing fluently	2	.5
Primary (Grade 1-5)	109	28.3
Secondary school (Grade 6-9)	148	38.4
High school (Grade 10 – 12)	86	22.3
College, university (>12)	10	2.6
Total	385*	100.0
Occupation		
Farmer	6	1.6
Government employee	1	.3
Entertainment employee	48	12.5
Sales/office clerk	6	1.6
Business person	41	10.6
Student	6	1.6
Self-employed	100	26.0
Sex worker	4	1.0
Currently unemployed	106	27.5
Worker	29	7.5
Singer	11	2.9
Pupil	18	4.7
Hairdresser	9	2.3
Total	385*	100.0
Income*		
Low	180	48.4
High	192	51.6
Total	372	100.0
Mean = US$92; Median = US$78; Min = 0; Max = US$1110; SD = US$88.4		
Self-reported sexual orientation		
Prefers men as partners only	209	54.1
Prefers men to women as partners	64	16.6
Prefers women as much as men	16	4.1
Prefers women to men as partners	87	22.5
Prefer women as partners only	10	2.6
Total	386	100.0

Respondents were from diverse socioeconomic backgrounds, ranging from unemployed to government employee. Respondents who were current unemployed (28%), self-employed (26%), Entertainment employee (13%) and business person (11%) occupied dominant proportions when compared with other occupations. In terms of income, the mean of income was US$92, with a range from 0 to US$1110. Low income refers to MSM earned money less than monthly income per capita in this province (US$70) and the rest is high income MSM; more than a half of MSM had high income. Regarding self-reported sexual orientation, a high proportion of MSM were homosexual orientation (54%), following by MSM who oriented men and women was not difference (23%), preferred man to woman (17%) and small proportion of them oriented heterosexual (2.6%).

4.1.1.2 Selected characteristics of MSM in Angiang Province

Table 4-2 reveals selected socio-demographic characteristic for the 386 MSM who participated in this study. MSM aged less than 20 occupied 43% of MSM, when older age was 57%. More than one third of MSM had primary education or lower (37%) when higher primary education. A higher percent of them was currently unemployed and the highest percent worked in the business sector. Regarding self-reported sexual orientation, MSM sexual orientation was divided into three distinct groups; 54% were homosexual, 43% were bisexual and 2.1% were heterosexual. Sexual experiences of MSM were showed in table 4-2. This includes types of sexual partners, number of sexual partners, and condom use, which were reported from those MSM who had ever had sex during the last 3 months prior to the survey. And sexual preferences were reported from those MSM who had ever had sex during the last 12 months prior to the survey. 63% of them had sexual male partners only and the rest had both male and female partners. Two thirds of the MSM (67%) had more than one sexual partner during the last 3 months. 44% of MSM had both insertive and receptive sex, followed by insertive anal sex only (29%), no anal sex with male partners (15%) and receptive anal sex (13%).

Table 4-2 Distribution of selected characteristics among MSM in Angiang province

Variable	Frequency N = 386	Percent (%)
Age		
Younger	165	42.9
Older	220	57.1
Total	385	100.0
Education		
Lower	141	36.6
Higher	244	63.4
Total	385	100.0
Occupation		
Currently unemployed sector	130	33.8
Entertainment sector	72	18.7
Business sector	183	47.5
Total	385	100.0
Self-reported sexual orientation		
Homosexual	209	54.1
Bisexual	167	43.3
Heterosexual	10	2.6
Total	386	100.0
Type of partners		
Male partner only	244	63.2
Both male and female partner	142	36.8
Total	386	100.0
Number of partners		
More than one	241	66.9
One	119	33.1
Total	360	100.0
Sexual preferences		
Insertive only	110	28.6
Receptive only	50	13.0
Both receptive and insertive	169	43.9
No anal sex with male partner	56	14.5
Total	385	100.0

4.1.2 *Selected risk behaviors:*

MSM had sexual preferences with their partners was divided into 5 categories based on the way of anal sex and MSM who did not have sex. MSM who were always a giver occupied 29%, followed by about half a giver and half a receiver (26), always a receiver (13%), a receiver most of the time (11%) and a giver most of the time (7%). Three quarters (74%) of MSM never used any kinds of drugs, 12% had injected drugs only, 9% had used MDMA and 4% had used both kinds of drugs.

Among MSM injected drug, there was 12% of MSM shared used needle and syringes to drug use partners during the last month, 17% injected by other drug use partners' used needles and syringes during the last month. In terms of alcohol use, almost all MSM had ever drunk alcohol (94%). Among MSM ever drank alcohol, three quarters of MSM had sex when got drunk.

Table 4-3 Distribution of selected risk behaviors among MSM in Angiang province

Selected risk behaviors	Frequency N = 386	Percent (%)
Sexual preferences		
Always a giver	110	28.6
A giver most of the time	26	6.8
About half a giver and half a receiver	99	25.7
A receiver most of the time	44	11.4
Always a receiver	50	13.0
No anal sex	56	14.5
Total	385	100.0
Alcohol use		
Never	23	6.0
Ever	363	94.0
Total	386	100.0
Have sex when got drunk		
Never	71	24.8
Ever	215	75.2
Total	286	100.0
Drug use		
Never	287	74.4
Ever MDMA use	36	9.3
Ever injecting drug use	48	12.4
Both ever MDMA and injecting drug use	15	3.9
Total	386	100.0
Sharing needle and syringes to drug use partners during the last month		
Yes	6	11.5
No	46	88.5
Total	52	100.0
Injected drugs by drug used partners' needle and syringes during last month		
Yes	9	17.3
No	43	82.7
Total	52	100.0

4.1.3 Unprotected sex

Table 4-4 Distribution of sexual experiences among MSM in Angiang province

Sexual experiences	Frequency N=386	Percent (%)
Number of partners during the last 1 months		
1	131	42.3
2	59	19.0
3	34	11.0
4 and over	86	27.7
Total	310*	100.0
Mean = 3.4; Median = 2.0; Min = 1; Max = 30; SD = 4.7		
Sex with male partner and condom used during last 1 month		
Inconsistent	248	80
Consistent	62	20
Total	310*	100
Number of partners during the last 3 months		
1	119	33.3
2	52	14.6
3	50	14.0
4 and over	136	38.1
Total	357*,**	100.0
Sex with all male partner and condom used during last 3 months		
Inconsistent	285	79.2
Consistent	75	20.8
Total	360*	100.0
Number of male clients during the last 1 months		
1	37	36.3
2	32	31.4
3	15	14.7
4 and over	18	17.6
Total	102*	100.0
Mean = 3.3; Median = 2.0; Min = 1; Max = 30; SD = 4.8		
Anal sex and condom use with clients during last 1 months		
Inconsistent	68	66.7
Consistent	34	33.3
Total	102	100.0
Number of MSW partners during the last 3 months		
1	9	47.4
2	4	21.1
3	3	15.8
4 and over	3	15.8
Total	19	100.0
Mean = 4.7; Median = 2.0; Min = 1; Max = 50; SD = 11.1		
Condom use and anal sex with MSW partners during last 3 months		
Inconsistent	13	68.4
Consistent	6	31.6
Total	19	100.0

Sexual experiences	Frequency N=386	Percent (%)
Number of consensual male partner during last 1 months*		
1	91	52.3
2	46	26.4
3	17	9.8
4 and over	20	11.5
Total	174*	100.0
Mean = 2.2; Median = 1.0; Min = 1; Max = 15; SD = 2.3		
Anal sex with consensual male partner during last 1 months		
Inconsistent	134	76.1
Consistent	42	23.9
Total	176	100.0
Sex with FSW during the last 12 months		
Inconsistent	22	44.0
Consistent	28	56.0
Total	50*	100.0
Sex with female clients during last 12 months		
Inconsistent	4	40.0
Consistent	6	60.0
Total	10*	100.0
Sex with consensual female partner during the last 12 months		
Inconsistent	83	66.9
Consistent	41	33.1
Total	124*	100.0

*Answered “Have all type of sex with”

** due to missing cases

Table 4-4 showed the condom use with all male partners which generally inconsistent condom uses among MSM were low, 21% during the last three months and 20% during the last month, there was a difference of proportion between them because of the sample size which some of MSM had consistent condom use during the last three months were high but they did not have sex during the last month. Condom use with consensual male partner (24%), followed by condom use with MSW (32%) and condom use with male clients (33%). However, condom uses with female partner were different, inconsistent condom use decreased with female clients (40%) and FSW (44%). A relative high proportion of inconsistent condom use with their consensual female partners was 67%.

Number of partners:

Generally, number of sexual partners with every type of partner was one occupied highest proportion, except sex with all sexual partners during the last three months. Percentage of number of sexual partners with all partners during the last three months was 4 and over is much higher than during the last one month. Regarding number of every type of male partners, the highest mean number of male partners is 4.7 with MSWs, followed by MSM who were MSWs (3.3) and consensual male partners (2.2). On average, mean number of all type of partners during the last one month is 3.4.

4.2 Bivariate analysis

This section determines the relationship between risk behaviors related to HIV infection and unprotected sex among MSM in Angiang province.

4.2.1 Distribution of age group

Table 4-5 shows that the younger MSM used condom more inconsistent with their male clients than older MSM. However, older MSM tended to use condom in sex with male clients more inconsistent than younger MSM (46% vs. 54%). The older MSM was, the higher proportion of MSM uses drugs, ever drank alcohol and had sex when got drunk. Older MSM injected drug by other drug use partners' used needle and syringes than younger MSM. In sexual preferences, younger MSM were receiver occupied higher proportion (54%) when compared with older MSM.

Table 4-5 Percentage distribution of age group among MSM in Angiang province

Risk behaviors	Age group			
	Younger MSM	**Older MSM**	**Total**	**N**
Anal sex for money and inconsistent condom use with male partner during the last 1 months	53.7	46.3	100	67
Anal sex and inconsistent condom use with MSW during the last 3 months	30.8	69.2	100	13
Anal sex and inconsistent condom use with consensual male partner during the last 1 months	36.8	63.2	100	133
Sex and inconsistent condom use with FSW during the last 12 months	18.2	81.8	100	22
Sex and inconsistent condom use with female partner and receive money for sex during the last 12 months	50.0	50.0	100	4
Sex and inconsistent condom use with consensual female partner during the last 12 months	43.4	56.6	100	83
Ever use alcohol	42.3	57.7	100	362
Have sex when got drunk	37.7	62.3	100	215
Drug use				
Ever MDMA use	44.4	55.6	100	36
Ever injecting drug use	18.8	81.3	100	48
Both ever MDMA and injecting drug use	33.3	66.7	100	15
Sharing used needle and syringes to drug use partners during the last month	50.0	50.0	100	6
Injected drugs by other drug use partners' used needle and syringes during the last month	22.2	77.8	100	9
Sexual preferences				
No anal sex with male partner	50.0	50.0	100	56
Insertive only	30.0	70.0	100	110
Receptive only	54.0	46.0	100	50
Both receptive and insertive	45.8	54.2	100	168

4.2.2 Distribution of education level

Table 4-6 shows that the lower educated MSM used condom more inconsistent with their female partners than higher educated MSM, however condom use with male partner is contradictory, lower educated MSM tended to use condom more consistent than higher educated MSM. The higher educated MSM had, the higher proportion of MSM ever drank alcohol and had sex when got drunk. In term of drug use, lower educated MSM injected drugs higher than higher educated MSM, however, higher educated MSM used more MDMA (72%) or both MDMA and

injecting drugs (87%) than others. Using needles and syringes with drug use partners was higher in higher educated MSM. In sexual preferences, higher educated MSM were receiver and/or inserter occupied higher proportion when compared with lower educated MSM.

Table 4-6 Percentage distribution of education level among MSM in Angiang province

Risk behaviors	Education			
	Lower	Higher	Total	N
Anal sex and inconsistent condom use with male partner and receive money for sex during the last 1 months	35.3	64.7	100	68
Anal sex and inconsistent condom use with MSW during the last 3 months	23.1	76.9	100	13
Anal sex and inconsistent condom use with consensual male partner during the last 1 months	40.3	59.7	100	134
Sex and inconsistent condom use with FSW during the last 12 months	68.2	31.8	100	22
Sex and inconsistent condom use with female partner and receive money for sex during the last 12 months	50.0	50.0	100	4
Sex and inconsistent condom use with consensual female partner during the last 12 months	51.8	48.2	100	83
Ever use alcohol	37.0	63.0	100	362
Have sex when got drunk	39.5	60.5	100	215
Drug use				
Ever MDMA use	27.8	72.2	100	36
Injecting drug use	62.5	37.5	100	48
Both MDMA and injecting drug use	13.3	86.7	100	15
Sharing used needle and syringes to drug use partners during the last month	44.4	55.6	100	9
Injected by other drug use partners' used needle and syringes during the last month	33.3	66.7	100	6
Sexual preferences				
No anal sex with male partner	30.4	69.6	100	56
Insertive only	45.5	54.5	100	110
Receptive only	42.0	58.0	100	50
Both receptive and insertive	31.5	68.5	100	168

4.2.3 Distribution of condom use during the last three months

In table 4-7, in all selected risk behaviors, consistent condom uses were lower than inconsistent condom use. Consistent condom use was higher among MSM who never drink alcohol than MSM ever drank alcohol. In term of drug use, consistent condom use among MSM who ever used MDMA was higher than other MSM who did not use drugs or injecting drugs. MSM who had both male and female partners used condom more consistent than MSM had male partners only. Regarding number of partners and sexual preferences, there were no strong different between the groups. In table 4-7, there was no significant association between risk behavior factors and unprotected sex at the 0.05 level.

Table 4-7 Distribution of condom use by selected risk behaviors among MSM in Angiang province

Selected risk behaviors	Unprotected sex				χ^2 value
	Inconsistent	Consistent	Total	(n)	
Alcohol use					
Never	72.2	27.8	100	18	0.55
Ever	79.5	20.5	100	342	
Drug use					
Drug nonuse	81.6	18.4	100	267	
Ever MDMA use only	65.7	34.3	100	35	6.26
Ever injecting drug use only	79.1	20.9	100	43	
Ever both methods of drug use	66.7	33.3	100	15	
Number of partners					
More than one	78.4	21.6	100	241	0.24
One	80.7	19.3	100	119	
Type of partners					
Male partners only	81.9	18.1	100	232	2.95
Both male and female partners	74.2	25.8	100	128	
Sexual preferences					
Insertive anal sex	80.8	19.2	100	52	
Receptive anal sex	78.0	22.0	100	100	0.20
Both receptive and insertive anal sex	78.3	21.7	100	46	
No anal sex with male	79.5	20.5	100	161	

4.3 Multivariate analysis

To examine the net effects of selected risk behaviors, drug and alcohol use and sexual experiences, on inconsistent condom use, binary logistic regression model was used because the outcome factor is a binary variable (yes and no). The results of the models are presented in Table 4-8. For these analyses, variables that had significance at the 0.05 level were considered statistically significant. Due to not enough observation for analysis, self-reported sexual orientation was recoded into two categories, homosexual and bisexual.

Table 4-8 Odds ratios of condom use by selected risk behaviors, after controlling for other factors

Personal factors and risk behaviors	Inconsistent condom use (n=348)		
	Coefficient B	S.E	Odds ratios
Age: Older (ref)			
Younger	-0.454	0.298	0.64
Education: Higher (ref)			
Lower	0.052	0.307	1.10
Occupation: Currently unemployed sector (ref)			
Entertainment sector	-0.484	0.389	0.616
Business sector	0.046	0.328	1.05
Self-reported sexual orientation: Homosexual (ref)			
Bisexual	0.910	0.482	2.48
Alcohol use: Ever (ref)			
Never	-0.391	0.581	0.68
Drug use: Never (ref)			
Ever use MDMA	-0.811	0.404	0.44*
Ever use injecting drug	-0.398	0.455	0.67
Ever use both MDMA and injecting drug	-0.694	0.603	0.50
Type of partners: Both male and female partners (ref)			
Male partner only	1.115	0.469	3.05*
Number of partners: One(ref)			
More than one	-0.072	0.300	0.93
Sexual preferences: No anal sex with male partner (ref)			
Insertive only	-0.277	0.466	0.76
Receptive only	0.064	0.533	1.07
Both receptive and insertive	0.039	0.422	1.04

Note: *p<0.05

The results from table 4-8 indicate that type of partners was positively and significantly associated with condom use. Those who had male partners only were three times more likely to use condoms inconsistently than those who had both male and female partners. The second variable, MDMA use, had a negative association with inconsistent condom use. To be more precise, those who had ever used MDMA were 54% ($p<0.05$) more likely to consistently use condom than those who had never used drugs.

4.4 Discussion

Different from previous study (Nguyen TA, 2008), MSM in this study were younger (less than age 20). They had low education, less than 3% had college or university education, and majority of them were currently unemployed. Accordance with Ma et al. (2007), the percentage of MSM who used condom consistently during the last month and last three months were low (20% and 21% respectively). Using condom consistently with consensual male partner occupied the highest proportion (76%) when compared with other types of male partner as well as consensual female partners. However, using condoms consistently with female partner was different, consistent condom use was higher when they had sex with female clients (60%) and FSW (54%).

On average, mean number of all types of partner during the last month was 3.4, it is not different from mean number of sexual partners of 3.3 of study in Hochiminh city by Colby (2003). Among MSM injected drug, there was 12% of MSM shared used needle and syringes to drug use partners during the last month, 17% injected by other drug use partners' used needles and syringes during the last month. Almost all MSM had ever drunk alcohol (94%) and among MSM ever drank alcohol, three quarters of MSM had sex when got drunk.

Younger MSM used condom more inconsistent with their male clients than older MSM, however condom use with other types of partner of younger MSM is more consistent than older MSM. The older MSM were, the higher proportion of MSM who use drugs, ever drank alcohol and had sex when got drunk. Older MSM injected drug by other drug use partners' used needle and syringes than younger MSM.

Lower educated MSM used condom more inconsistent with FSW than higher educated MSM, however condom use with other types of partner is more consistent than higher educated MSM, except large indifference in having sex with consensual female partners between these two MSM groups. The higher educated MSM had, the higher proportion of MSM ever drank alcohol and had sex when got drunk. In term of drug use, lower educated MSM injected drugs higher than higher educated MSM, however, higher educated MSM used more MDMA (72%) or both MDMA and injecting drugs (87%) than others. Using needles and syringes with drug use partners was higher in higher educated MSM. In sexual preferences, higher educated MSM were receiver and/or inserter occupied higher proportion when compared with lower educated MSM.

Consistent condom use was higher among MSM who never drink alcohol than MSM who ever drank alcohol, this result is accordance with the study of Dolezal et al. (2000) and Sheridan S et al. (2009) in which drug and alcohol use were associated with low levels of consistent condom use. In term of drug use, consistent condom use among MSM who ever used MDMA was higher than other MSM who did not use drugs or injecting drugs. MSM who had both male and female partners used condom more consistent than MSM had male partners only.

Inconsistent condom use in the final model is the result of two factors, (1) type of partners and (2) drug use.

MSM who had both male and female partners used condoms more consistent than MSM who had male partners only. This finding was consistent with a study in Bangkok (Li et al., 2009) and might be explained by MSM who had sex with both male and female partners wanted to protect for their female partners or their female partners wanted to protect themselves.

An important finding from this study that is different from previous studies (Klitzman et al., 2002; Parsons et al., 2007; Woody et al., 1999) is that MDMA users used condoms more consistently than MSM who did not use any kinds of drugs. This might be explained by social and cultural characteristics, particularly this study was implemented in Vietnam, a developing country where MDMA use is a new pleasure for rich people who have better opportunity to attend higher education and better knowledge in protecting themselves from risks of HIV infection. Moreover, MDMA is

very expensive for low income or young MSM. Besides, the duration of using condoms when having sex of MDMA users did not happen along with the duration of this study.

Previous studies (Dolezal et al., 2000; Sheridan et al., 2009) have found an association between drug and alcohol use and unprotected sex. Despite alcohol use is not related to inconsistent condom use in this study, there was a relative difference between MSM who drank and did not drink, MSM who drank alcohol were 32% more likely to use condoms inconsistently.

In summary, this study indicated that there were two factors that affected risk behaviors amongst MSM. A higher proportion of consistent condom use was found among MDMA users, and MSM who had only male partner used condoms more inconsistently.

CHAPTER V
CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study aims to examine the effects of selected risk behaviors on inconsistent condom use among MSM when controlling for personal factors. The dependent variable is inconsistent condom use that represented unprotected sex. Selected risk behaviors are used, namely, drug use, alcohol use and sexual experiences (type of partners, number of partners and sexual preferences). Personal factors include age, education level, occupation level, and self-reported sexual orientation.

Younger MSM used condom more inconsistently with their male clients than older MSM, lower educated MSM used condom more inconsistently with FSWs than higher educated MSM and injected drugs more than higher educated MSM. However, higher educated MSM drink alcohol and have sex when drunk, using more MDMA or both MDMA and injecting drugs, using needles and syringes with drug use partners when compared with lower educated MSM.

The key findings from this research are that risk behaviors (MDMA use and type of partner) affected unprotected sex of MSM. Those who had male partners only were three times more likely to inconsistently use condom than those who had both male and female partners. As for MDMA use, those who had ever used MDMA were 54% more likely to consistently use condom than those who had never used drugs ($p<0.05$).

In conclusion, risk behaviors (MDMA use and type of partners) of MSM are associated with unprotected sex when controlling for other factors, despite the fact that MDMA use had a different result from previous studies.

5.2 Recommendations for harm reduction intervention programs

Firstly, the results of this study will advocate policy makers and stakeholders to understand the comprehensive situation of MSM and provide more effective support for harm reduction intervention programs in Angiang province. These can even assist to facilitate the integration into a national program in order to increase the effectiveness of the intervention. Peer educator assistance should counsel for all MSM, especially young MSM, about condom use to increase consistent condom use. Moreover, counseling about using needles and syringes among this group should be included.

Secondly, interventions must address HIV or non-HIV-related issues confronting youth in difficult circumstances, and the role of peer networks for MSM. Increasing perception about HIV/AIDS among youth is necessary, thus Ministry of Health and Education should compile appropriate curriculum regarding HIV/AIDS in school.

5.3 Recommendations for future research

Since the cross-sectional study does not allow concluding the cause – effect relationship, the longitudinal studies (e.g. panel studies) may be a solution for analyzing a cause - effect relationship. Moreover, besides studying risk behaviors in this study, further studies should explore the economic and policy environments, which are not able to be mentioned in this study due to lack of necessary information.

Besides, this study gave the basic information about HIV/AIDS situation among this group for this province and others, which is an emerging issue in the past years, especially in Vietnam.

Therefore, other studies need to give more information for intervention program. In particular, qualitative research will provide more explanations on risk behaviors performance, especially MDMA use and sexual behaviors, that could not be fulfilled and clear explanation in this study. In addition, the combination of qualitative and quantitative research should be built up at the higher levels of measurement in order to indicate more factors that importantly influence their risk behaviors.

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APPENDIX

Some selected questions from the questionnaire that were redrafted as follow:

No.	Questions	Coding of answers	Skip to
Q101	In what month and year were you born?	Month [__|__] Year [__|__|__|__] Don't remember 99	
Q102	What is your highest level of education? ***Read out the possible answers and circle one***	Illiterate 1 Writing fluently 2 Primary (Grade 1-5) 3 Secondary school (Grade 6-9) 4 High school (Grade 10 – 12) 5 College, university (>12) 6	
Q103	***Currently***, what occupations do you have to support yourself? *(Explain self-employed: driver, road-side seller, etc.)*	**No** Farmer 1 Government employee 2 Entertainment employee 3 Sales/office clerk 4 Business person 5 Student 6 Self-employed 7 Sex work 8 Currently unemployed 9 Others (specify) 10 ……	
Q104	What is your average monthly income? (Income from all sources)	VND……	
Q105	Which of the following statements best describe how you feel? ***Read out list and circle only one appropriate answer***	Prefers men as partners only 1 Prefers men to women as partners 2 Prefers women as much as men 3 Prefers women to men as partners 4 Prefer women as partners only 5	

The following questions are very private, as they concern sex and condom use. Please answer or provide explanations as honestly as possible. You do not need to worry, as we guarantee the confidentiality of your answers and no one would know about your answers.

Section 2: Sexual partners

No.	Questions	Coding of answers	Skip to
Sex with Men			
Q201	**Inclusion Criterion** ***During the last 12 months*, did you have any type of sex (manual, oral or anal) with a man?**	**1= Yes** **2= No (Thank respondent and end interview)**	
Q202	***During the last 1 month***, did you have sex with a man?	Yes 1 No 2	**→206**
Q203	***During the last 1 month***, how many men have you had sex with?	|__|__|__| men Don't remember 999	
Q204	If you can't remember or have no answer… Can you at least tell me if it was less than 10 men or 10 men or more?	Only 1 1 2 to 4 men 2 5 to 9 men 3 10 or more men 4 Don't remember 9	
Q205	***During the last 1 month***, of all the times you have had anal sex for money, how frequently have you and your partner used condom?	Always 1 Most of the time 2 Sometimes 3 Never 4	
Q206	***During the last 3 month***, how many men have you had sex with?	|__|__|__| men Don't remember 999	
Q207	If you can't remember or have no answer… Can you at least tell me if it was less than 10 men or 10 men or more?	Only 1 1 2 to 4 men 2 5 to 9 men 3 10 or more men 4 Don't remember 9	
Q208	***During the last 3 month***, of all the times you have had anal sex for money, how frequently have you and your partner used condom?	Always 1 Most of the time 2 Sometimes 3 Never 4	
Q209	***During the last 12 months***, having anal sex with a man, are you a giver, receiver or both? *Explain:* *A giver: person who inserts his penis into other man's anus* *A receiver: person whose anus was inserted with a penis of other man* ***Circle 1 appropriate answer only***	Always a giver 1 A giver most of the time 2 About half a giver and half a receiver 3 A receiver most of the time 4 Always a receiver 5 No anal sex 6 No response 9	

Received payment for sex			
Q210	***During the last 12 month***, have you had sex with other men for money?	Yes 1 No 2	→**215**
Q211	***During the last 1 month***, have you had sex with other men for money?	Yes 1 No 2	→**215**
Q212	***If yes***, how many men?	|__|__|__men Don't remember 999	
Q213	Among them, how many have you had anal sex with (including both inserting and receiving)? *Explain:* *An inserter: person who inserts his penis into other man's anus* *A receiver: person whose anus was inserted with a penis of other man*	|__|__|__| men Don't remember 999 If the answer is 0 men	→**215**
Q214	***The last time*** you had anal sex for money, did you and your partner use a condom from the beginning of sex act until after ejaculation?	Yes 1 No 2 Don't remember 9	
Q215	***During the last 1 month***, of all the times you have had anal sex for money, how frequently have you and your partner used condom?	Always 1 Most of the time 2 Sometimes 3 Never 4	
Paid for sex			
Q216	***During the last 12 month***, have you had to pay for having sex with men?	Yes 1 No 2	→**221**
Q217	***During the last 1 month***, have you had to pay money for having sex with men?	Yes 1 No 2	→**221**
Q218	***If yes***, how many men?	|__|__|__| men Don't remember 999	
Q219	Among them, how many have you had anal sex with (including both giving and receiving) ?	|__|__|__| men Don't remember 999 If the answer is 0 men	→**221**

Q220	***The last time*** you had anal sex with a partner you paid, did you and your partner use a condom from the beginning of sex act until after ejaculation?	Yes 1 No 2 Don't remember 9	
Q221	***During the last 1 month***, of all the times you have had anal sex with a partner that you paid, how frequently have you used condom?	Always 1 Most of the time 2 Sometimes 3 Never 4	
Consensual sex: Having sex where no payment is made on either side			
Q222	***During the last 12 month***, did you ever have sex with men where no payment was made on either side?	Yes 1 No 2	**→226**
Q223	***During the last 1 month***, did you ever have sex with men where no payment was made on either side?	Yes 1 No 2	**→226**
Q224	***If yes***, how many men?	|__|__|__| men Don't remember 999	
Q225	How many of them have you had anal sex with *in the last 1month*?	|__|__|__| men Don't remember 999 If the answer is 0 men	**→226**
Q226	***During the last 1 month***, of all the times you and your partner had anal sex with a consensual partner, how frequently have you used a condom?	Always 1 Most of the time 2 Sometimes 3 Never 4	
Sex with Women			
Q227	***During the last 12 month***s, have you had vaginal or anal sex with any woman?	Yes 1 No 2	**→301**
Q228	***During the last 12 month***s, have you had vaginal or anal sex with a woman whom you have paid for sex?	Yes 1 No 2	**→229**
Q229	***During the last 12 month***s, how often have you used condoms when you had vaginal or anal sex with female sex workers?	Always 1 Most of the time 2 Sometimes 3 Never 4	
Q230	***During the last 12 month***s, have you had sex with women who paid you for sex?	Yes 1 No 2	**→231**

Q231	***During the last 12 month***s, how often have you used condoms when you had vaginal or anal sex with women who paid you for sex?	Always 1 Most of the time 2 Sometimes 3 Never 4	
Q232	***During the last 12 months***, have you had consensual sex with a woman whom you have not paid? *Consensual sex: having sex without payment involved*	Yes 1 No 2	→**301**
Q233	***During the last 12 month***s, how often have you used condoms during having vaginal or anal sex with any of your consensual women partners?	Always 1 Most of the time 2 Sometimes 3 Never 4	

Section 3: Alcohol and Drug Use

No.	Questions	Coding of answers	Skip to
Q301	Have you ever drunk alcoholic drinks (beer, whisky, etc.)?	Yes 1 No 2	→**304**
Q302	Have you ever been drunk?	Yes 1 No 2	→**304**
Q303	Did you ever have sex when you were drunk?	Yes 1 No 2	
Q304	Have you ever used any recreational drugs such as cocaine, ecstasy or valium, etc.?	Yes 1 No 2	→ **Thanks and end interview**
Q305	Have you ever used recreational drugs without injecting (not prescription drugs)?	Yes 1 No 2	→ **307**
Q306	What kinds of recreational drugs without injecting did you use?	**Yes** **No** Heroin 1 2 Ecstasy 1 2 MDMA 1 2 Others (specify) 1 2 ……	
Q307	Have you ever injected recreational drugs (not prescription drugs)?	Yes 1 No 2	→ **Thanks and end interview**

Q308	When you injected, have you ever used needles/syringes that had previously/just been used by someone else?	Yes 1 No 2 Don't remember 9	
Q309	***<u>During the last 1 month</u>***, have you injected drugs?	Yes 1 No 2	→ **Thanks and end interview**
Q310	***<u>During the last 1 month,</u>*** when you injected, how often have you used needles/syringes that had previously/just been used by someone else?	Always 1 Most of the time 2 Sometimes 3 Never 4	
Q311	***<u>During the last 1 month,</u>*** when you injected, how often have you shared your used needles/syringes to your drug use partners?	Always 1 Most of the time 2 Sometimes 3 Never 4	

The Interview is completed here. Thank you very much for your help and time. Is there anything you want to discuss with us?
Please go to the next room for counseling and testing procedure!

BIOGRAPHY

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