FACTORS RELATED TO SEXUAL RISK BEHAVIOR AMONG FISHERMEN IN BINH DINH AND BINH THUAN PROVINCES, VIETNAM, 2008-2009

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF ARTS
(POPULATION AND REPRODUCTIVE HEALTH RESEARCH)
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY
2010

Thesis
entitled

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for the degree of Master of Arts
(Population and Reproductive Health Research)
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ACKNOWLEDGEMENTS

My study would not have been possible without the support and encouragement of individuals and institutions.

My foremost thank goes to my advisors Dr. Kerry Richter, and Dr. Kriengsak Rojnkureesatien for their insights, suggestions, and valuable feedback contributed greatly to this thesis. My thanks also go to the chair of my thesis examination committee Assoc. Prof. Dr. Chai Podhisita and the external examiner Dr. Anthony Pramualratana for their kindness in providing valuable comments and suggestions for improvement. I would also like to thank to the Program Director Asst. Prof. Dr. Aree Jampaklay and program coordinator Ms. Luxuna Nil-Ubol for their great support. I am grateful to all IPSR lecturers and staff for their valuable knowledge, advice and kindness as well as all my friends for their friendship and support in sharing their knowledge and experience with me during my stay in Thailand.

All the appreciation and thank to Vietnam HIV/AIDS prevention project for providing the budget for my study at Mahidol University. I am especially indebted to leaders of the Nhatrang Pasteur Institute as well as leaders of Department of Epidemiology for nominating me to this study. I greatly appreciate my colleagues for their support and share of work during my absence.

I am also indebted to Mr. Jason Theede for editing of this thesis.

Lastly, I would also like to thank my family for their ongoing encouragement and support.

Le Xuan Huy

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ABSTRACT

The objective of this study was to describe factors of age, marital status, level of education, knowledge of HIV/AIDS, attitude towards people living with HIV/AIDS, drug use, perceived risk of HIV infection, perceived availability of condoms, received information regarding HIV/AIDS prevention, and to assess any association of these factors with sexual risk behavior among fishermen in Binh Dinh and Binh Thuan provinces, Vietnam.

Secondary data from a cross-sectional study "The survey on knowledge, attitude, behavior on HIV/AIDS prevention among fishermen in some Central provinces, Vietnam, 2008-2009" was used for analysis. The total sample consisted of 134 fishermen who had sex with non-regular partners in the past year.

In bivariate analysis, the results showed that knowledge of HIV/AIDS, drug use, perceived risk of HIV infection, perceived availability of condoms, and received information regarding HIV/AIDS prevention were statistically associated with sexual risk behavior of fishermen.

In multivariate analysis, the results showed that knowledge of HIV/AIDS, attitude towards people living with HIV/AIDS, and perceived risk of HIV infection have a significant association with sexual risk behavior of fishermen.

The results suggest that providing continual access to health education, together with condoms to fishermen is crucial. The 100% condom use program should be promoted among fishermen.

KEYWORD: HIV/AIDS/FISHERMEN/NON-REGULAR PARTNERS/ SEXUAL RISK BEHAVIOR/INCONSISTENT CONDOM USE

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LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
FHI	Family Health International
FSW	Female Sex Worker
HBM	The Health Belief Model
HIV	Human Immunodeficiency Virus
KAB	Knowledge, Attitude, Behavior
MOH	The Ministry of Health of Vietnam
NGO	Non-Governmental Organization
NPI	The Nhatrang Pasteur Institute of Vietnam
PLHA	People Living with HIV/AIDS
STI	Sexually Transmitted Infection
UNAIDS	The United Nations Joint Program on HIV/AIDS

CHAPTER I
INTRODUCTION

1.1. Problem statement

HIV/AIDS is a pandemic that can have devastating consequences on families and communities, and can seriously affect the economic and social development of a country. People living with HIV worldwide continued to increase in 2008 with the number estimated at around 33.4 million. In 2008, an estimated 2.7 million new HIV cases occurred and 2 million people died by AIDS-related diseases worldwide. The HIV pandemic remains the most challenge of infectious diseases to public health (UNAIDS, 2009).

According to statistics from the Ministry of Health-Vietnam dated December 2009, the cumulative number of HIV infections is 160,019 cases, with 35,603 AIDS patients and 44,540 deaths by AIDS. The distribution of HIV is concentrated mainly in the 20-39 year age group, which contains 85.1% of people infected with HIV. Vietnam's HIV epidemic remains largely concentrated among key populations at high risk such as injecting drug users (18.4%), and female sex workers (3.2%). Prevalence in the general population is estimated at 0.28% (MOH, 2010).

Fishermen are at sea working on boats for several weeks or months. As they are a mobile group, they are particularly vulnerable to HIV infection. Factors affecting their risk are that they are young, live away from home with low education, and live under peer pressure. Thus, they are faced with environmental risks such as alcohol, drug use and engaging in sexual intercourse with female sex workers. In addition, they have to face some difficulties in access to health information and services (Hu, 2004).

1.2. Problem justification

Fishermen have been identified as a population at high risk for HIV infection, particularly in South East Asian and Sub-Saharan African countries. An estimate of the HIV prevalence rate and absolute number of HIV infection showed that HIV infection is higher in fishermen than in other high risk populations such as injecting drug users, long distance drivers, and miners. This study also showed that the HIV prevalence rate in fishermen is 4-14 times higher than the average proportion of HIV-infected adults in countries with low or average incomes in Asia, Africa and Latin American regions. As fishermen are prominent in these regions, the impact of HIV/AIDS on this population is very serious, threatening the lives and socio-economic development of countries (Kissling, 2005).

A study in Ranong, Thailand in 2006 investigated the factors affecting the safe sexual behavior in regards to HIV/AIDS prevention among Myanmar migrant fishermen. The results showed that 22% said they drink alcohol, 8.6% used drugs and 1.6% reported sharing syringes and needles in. More than 50% had sex with female sex workers and said they went to the brothel after drinking. It is notable that only 44.6% reported that they always use condom when having sex with female sex workers (Maler Htoo, 2009).

Result of surveys in Kien Giang province, Vietnam in 2001 showed that the rate of HIV infection among fishermen was only 0.2%. However they had high risk behaviors: about 50% of them had sex with female sex workers and rate of using condoms among them was low (60%). Rate of HIV infection was high in those who self reported STIs: 12% (MOH, 2005).

Binh Dinh and Binh Thuan provinces of Vietnam have a long beach and the fishing industry is well developed. According to reports from the Nha Trang Pasteur Institute-Vietnam (February 2010), the estimated number of fishermen in the two provinces is over 30,000. The cumulative number of people living with HIV of Binh Dinh and Binh Thuan provinces are 630 and 985 respectively. Additionally, the number of HIV-infected fishermen in Binh Dinh and Binh Thuan provinces is 16 and 20 people (NPI, 2010).

These factors are alarming and imply that the HIV epidemic can spread rapidly among fishermen in the future.

An HIV/AIDS prevention program was implemented in Binh Thuan and Binh Dinh provinces in 1998. Currently, HIV/AIDS prevention programs in these two provinces are implementing according to the national strategy on HIV/AIDS prevention and control in Vietnam until 2010 and a vision to 2020. Specifically, HIV/AIDS prevention programs in Binh Thuan and Binh Dinh provinces include: Behavioral change information, education and communication program; HIV/AIDS harm reduction intervention program; Care and support for HIV/AIDS-infected people program; HIV/AIDS surveillance, monitoring and evaluation program; Access to HIV/AIDS treatment program; Prevention of mother-to-child HIV/AIDS transmission program; Sexually transmitted infections management and treatment Program; Blood transfusion safety Program; HIV/AIDS prevention and control capacity and international cooperation enhancing program. Although the program is broad, there is lack of specific HIV prevention programs among fishermen in Binh Dinh and Binh Thuan provinces of Vietnam (NPI, 2010). Therefore, it is felt deemed necessary to implement research among fishermen in Binh Dinh and Binh Thuan provinces of Viet Nam.

1.3. Research question

What factors are related to sexual risk behavior among fishermen in Binh Dinh and Binh Thuan provinces of Vietnam?

1.4. Research objectives

General objective:

To provide useful information for designing HIV/AIDS prevention interventions among fishermen in Binh Dinh and Binh Thuan provinces of Vietnam.

Specific objectives:

1. To describe factors related to sexual risk behavior among fishermen.
2. To describe sexual risk behavior among fishermen.
3. To identify the relationship between factors related to sexual risk behavior among fishermen.

CHAPTER II
LITERATURE REVIEW

2.1. Review about theory of the study

Intervention strategies to prevent the spread of HIV through sexual intercourse are the main target of HIV/AIDS prevention efforts worldwide. Most measures to prevent HIV transmission through sexual intercourse focus on changing sexual behavior. There are many theories of behavior are applied to make strategic changing sexual behavior. In the framework of this thesis, the “Health Belief Model” will be used to explain factors related to sexual risk behavior.

The Health Belief Model (HBM) explains and predicts health behaviors by focusing on attitudes and personal beliefs. The main content of the HBM is as follows (FHI, 2004; UNAIDS, 1999):

- Perceived threat, consists of two components: perceived susceptibility and perceived severity of health status. Perceived Susceptibility (or risk perception): How likely do you think you are to have this health issue? Perceived Severity: How serious a problem do you believe this health issue is? For example, awareness that can HIV infection if sex is not safe and this disease is very serious.

- Perceived Benefits: How well does the recommended behavior reduce the risk associated with this health issue? Perceived Barriers: What are the potential negative aspects of doing this recommended behavior? For example, awareness of condom use when having sex is to avoid the risk of HIV infection and awareness of the nuisance when condom use is negligible.

- Cues to Action: Factors which cause you to change, or want to change. For example, communication activities on HIV/AIDS are good; He saw some people with HIV/AIDS who have difficulty and those who died; He received a lot of experience from friends, he understands HIV/AIDS is serious.

- Self-Efficacy: One's "conviction that one can successfully execute the behavior required to produce the outcomes"

- Other variables: Demographic, sociopsychological indirectly affect behavior related to health.

In this model, individuals weigh the benefits against the costs and cognitive barriers to change. For changes to occur, the benefits must exceed costs. For HIV, these interventions often target perception of risk, belief in the seriousness of AIDS (no treatment), belief in the efficacy of condom use and benefits of condom use.

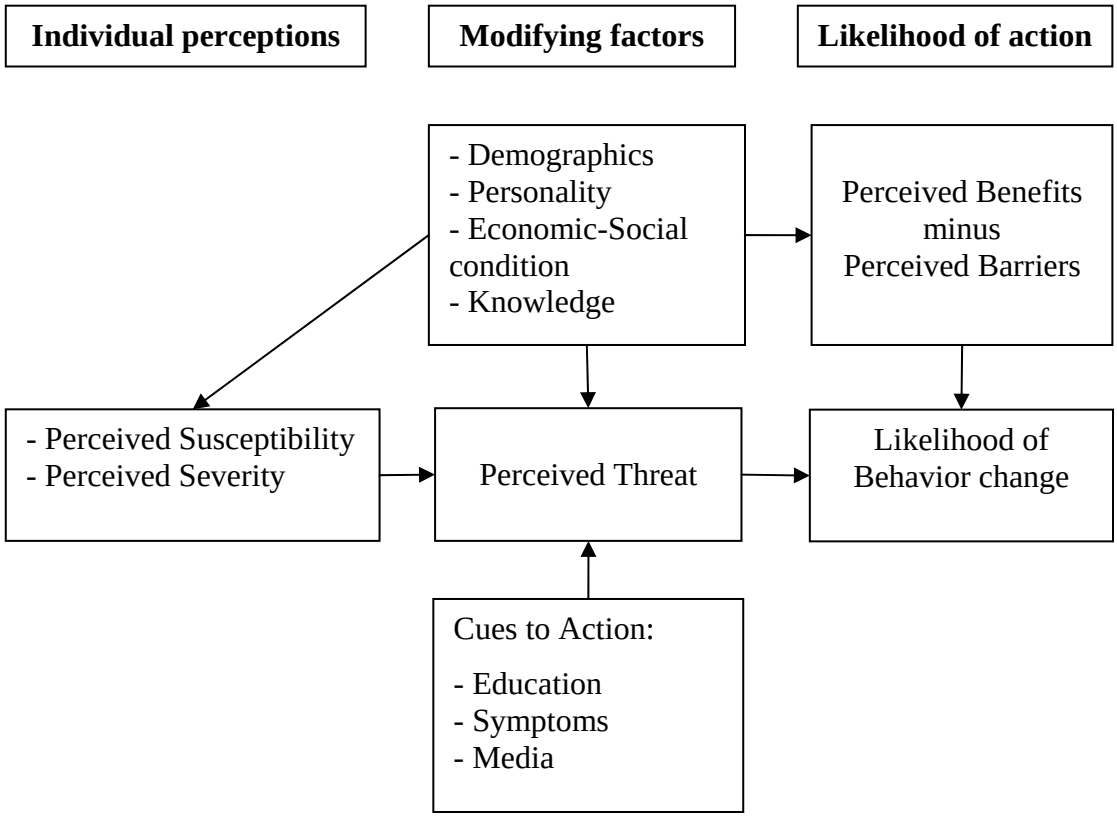

Figure 2.1. Conceptual model of the Health Belief Model

2.2. Review about factors related to sexual risk behavior

Age, marital status and sexual risk behavior:

Fishermen have income and opportunities for mobility away from their residential areas, making fishing an attractive career option for young people. The research in fishing communities on Lake Kioga, Uganda, showed 62.8% of respondents were between 18-30 years old (Allison, 2004; Seeley, 2005). The absence of family obligations for young, single men meant money was easily used for leisure activities' such as using alcohol and sexual services (Karukuza, 2005). Demographic factors increase the susceptibility, and age of the majority of fishermen are between 15-35 years old, the age group with the most frequent sexual activity and therefore the most vulnerable to HIV/STIs. Based on evidence from different context, it can be suggested that young and single or a migrant fishermen would participate more in sexual risk behaviors. The young fishermen are under peer pressure to indulge in a culture of risk that is characterized by multiple sex partners, drug and alcohol addiction. A study showed that 68% of fishermen were married and claimed to have divorced in a year and had three sexual partners in the past five years (Kher, 2008).

A study was conducted on Myanmar migrants in Samutsakhon province, Thailand. Results showed that respondents from 26 year old and over are more likely to have more than one sexual partner ($p<0.001$) and more likely to visit female sex workers than those less than 26 year old ($p<0.047$). This study also showed that the respondents who are widowed, divorced, single are more likely to have sex with female sex workers than those who were married and living with spouse ($p<0.003$) (Thu, 2003).

Education level and sexual risk behavior:

Fishermen often have low level of education. According to survey result of the project on seafarers in Songkhla and Samutsakhon provinces, Thailand showed that more than 80% of respondents only have primary education or less (Rojnkureesatien, 2006). Another study with Myanmar migrant fishermen in Ranong province, Thailand also found the majority of respondents have low education, 47.8% with primary education and 44% completing secondary education in Myanmar (Hu, 2004).

The evidence and theories show that people who learn are more likely to practice safer sex. The theories, knowledge and understanding of behavior and its consequences are necessary but not sufficient enough information for the implementation of behavior change and to strengthen awareness and attitudes. In the context of HIV, understanding of transmission routes and methods to prevent infection are necessary through safe sexual behavior. People with learning are more likely to be exposed to information as part of the official school system and also through the media. Level of education also can provide a framework of biological knowledge and understanding of HIV (Kher, 2008).

The educated are more likely to believe they have control over their own behavior, rather than individuals, and they are more likely to actually have control over their behavior. For example, educated women are more likely to negotiate safe sex with a partner. Data from demographic surveys (DHS) in 11 countries showed that women with primary education are more likely than those who have no education in using condoms. A study in four cities in Benin, Ndola in Zambia, Yaoundé in Cameroon and Kisumu in Kenya found that education leads to less risky sexual behavior. Condom use was more common among individuals than in all four cities. Other behaviors that reduce HIV transmission are also common among educated people, for example, more educated people are more likely to treat other sexually transmitted diseases that would otherwise increase their chances of HIV infection. Increasing education status of women and men led to a significant increase in condom use when having sex. A survey of over 4600 people who are not spouses in cities in Benin, Cameroon, Kenya and Zambia, showed that higher education led to higher rates of condom use (World Food Programme, 2006).

Knowledge of HIV/AIDS and sexual risk behavior:

A study of fishermen in Ranong province, Thailand showed that HIV/AIDS knowledge correlated with consistent condom use during sex. Fishermen who always condom use when having sex with female sex workers are more likely to know condom use and only one sexual partner are to protect themselves not infected HIV than those fishermen are inconsistent condom use when having sex with female sex workers ($p<0.05$) (Hu, 2004).

Another study on university students in Nigeria in 2002 showed that knowledge of HIV/AIDS is positively correlated with confidence in sexual practices ($r=0.226$, $p<0.01$) and changes in sexual behavior ($r=0.274$, $p<0.001$). It also shows that those with more knowledge will have more confidence in sexual practices and also are more likely to change their sexual behavior (Uwalaka, 2002).

Attitudes towards PLHA and sexual risk behavior:

Results from several studies demonstrate a significant relationship between attitude towards PLHA and sexual behavior. Result from a study on fishermen in Ranong province, Thailand showed the majority of respondents had neutral attitude towards PLHA. The association between negative attitude towards PLHA and unsafe sexual behavior with female sex workers is statistically significant ($p<0.001$) (Maler Htoo, 2009).

Another study on Myanmar migrants in Samutsakhon province, Thailand revealed the positive attitude towards PLHA related significantly with condom use during non-marital sex ($p<0.033$) (Thu, 2003).

Attitudes towards PLHA may also help predict behavior change. Some studies found high levels of empathy, tolerance, acceptance, and positive attitude towards PLHA will increase the performance of safe sexual behavior (Kher, 2008).

Drug use and sexual risk behavior:

There is much evidence that drug use is related to increases in sexual risk behaviors such as increasing the number who have sex with female sex worker, increase the number of sexual partners and decreased use of condoms when having sex. People using drugs are more likely to participate in risk behaviors related to HIV infection. Drug use was correlated with a trend in lifetime sexual risk behavior including, multiple partners, unprotected intercourse, sex with person who are high risk (for example, injecting drug users, female sex workers), and sex in exchange for money or drugs (Kher, 2008).

Some studies have showed that drug use is quite common in fishermen. Results of surveys on seafarers in Songkhla and Samutsakhon provinces, Thailand showed that seafarers using cannabis and amphetamine are common. About one tenth

of seafarers used heroin with seven percent of seafarers injecting drugs and about 44 percent having shared needles and syringes (Rojnkureesatien, 2006). 40.91 percent of fishermen who had used drugs in the past 12 months used condoms inconsistently with female sex workers (Hu, 2004). Another study on fishermen showed that the relevance have statistical significance between drug use and unsafe sexual behavior ($p<0.006$) (Mal er Htoo, 2009).

The relationship between drug use and sexual behavior is complex, and it is more difficult to identify the number of HIV infection related to this behavior. Different drugs affect different sexual behaviors, HIV infection can be transmitted through a series of practices such as sexual risk behaviors (penetration sex without condom use), exchange sex to get drugs or money, and sex with multiple sexual partners. Research in urban South African communities showed that cannabis use is associated with HIV status. Using cannabis increases the tendency to have multiple sexual partners and sexual risk behavior (multiple partners and not using condoms regularly). A people who use of cannabis, 19.7% are likely to have more sexual partners than those who never used cannabis (4.7%) (Peltzer, 2009)

Perceived risk of HIV infection and sexual risk behavior:

Some studies on seafarers in Thailand that investigated the perceived risk of HIV infection related to sexual risk behavior, found that seafarers often have low perception about the risk of HIV infection, and the main reason seafarers perceived that personal have risk of HIV infection is sexual contact with female sex workers (Ford and Chamratrithirong, 2008; Rojnkureesatien, 2006).

Fishermen have perception of low risk sexual behavior is common (Poggie, 1995; Béné and Merten, 2008). The existence of multiple sexual partners affect the risk of HIV transmission and cannot easily change if the current social context. Ignorance about the causes of the spread of HIV/AIDS, the taboos against discussion of issues related to sexual behavior, and discrimination against PLHA are all contributing factors that spread HIV/AIDS (Kher, 2008).

The relationship between risk perception and sexual behavior is complex. In a study of university students in Zimbabwe and Nigeria, those who use condoms are more likely to have an accurate perception of risk of HIV infection. In Ghana, self-

awareness of high-risk in youth was sharply associated with increased rates of condom use at last sex (Prata, 2006)

In South Africa, the main method of HIV/AIDS transmission is heterosexual intercourse, and most young people know that HIV/AIDS can be transmitted this way. Individuals who have sex should have a higher perception of the risk of HIV/AIDS (do not use condoms regularly, or have multiple sexual partners) (Anderson, 2007).

Perceived availability of condoms and sexual risk behavior:

The best strategy in preventing HIV/STI besides abstaining from sex is to use a condom. Availability of condoms is a key success in STI and HIV control. The condom provides with high quality, low cost and create social support to encourage use through various channels is extremely important. Condom use can reduce HIV infection rate. Thus, the coverage of programs and availability of condoms is a factor to help control HIV infection through sexual contact. This research revealed that fishermen who consistently use condoms when having sex with female sex workers are more likely to know where to get condoms at pharmacy (drug store) rather than fishermen who inconsistently use condoms with female sex workers ($p<0.05$) (Hu, 2004).

A study in Ranong, Thailand shows that the rate of condom use among fishermen is not high for many reasons, though one of particular concern is the low perceived availability of condoms, with the main source to provide condom is the pharmacy, sex workers and friends (The Thailand seafarers research team, 2002).

Received information regarding HIV/AIDS prevention and sexual risk behavior:

Studies have shown that most fishermen received information related to HIV/AIDS prevention through multiple channels. The study on fishermen in Ranong province, Thailand showed the received information on HIV/AIDS is statistically significant with safe sexual behavior when having sex with female sex workers ($p<0.005$) (Maler Htoo, 2009; Paw, 2006). Fishermen who consistently use condoms with female sex workers are more likely to receive information about HIV/STI

prevention than fishermen who inconsistently use a condom with female sex workers (p=0.05) (Hu, 2004).

When questioned about sources of information on HIV/AIDS prevention, most seafarers reported the main source is TV. Most seafarers learn about HIV/AIDS prevention from television, followed by medical staff, friends/relatives, and newspapers/magazines (Rojnkureesatien, 2006).

2.3. Review of sexual risk behavior

Unsafe sex with multiple partners often significantly increases the risk of HIV infection for fishermen (Appleton, 2000; Karukuza, 2005; Tanzarn, 2003). Research in fishing communities in Uganda showed that although 98% of fishermen are aware that HIV can be transmitted sexually, 30% still have 2-3 wives. Having sex without protection with multiple partners is one high risk behavior for HIV transmission among fishermen. Fishermen are said to not use condoms with their sexual partners, especially with regular partner because it often indicates a lack of trust (Kher, 2008).

Some research with fishermen in Thailand suggest they have characteristics of a mobile group. Fishermen often engaged in sexual risk behavior (Komonbut, 1995; Maticka, 1997; Vanlandingham, 1998), and lower condom usage when having sex with female sex workers (Bunnag, 1998).

Seafarers who engage in risky behavior is common, with access to female sex workers and the associated behaviour such as drinking alcohol and visiting karaoke bars. Most seafarers consistent condom use only with female sex workers and casual sex partners (Rojnkureesatien, 2006).

Seafarers are more likely to have sex with casual partners and female sex workers. Other factors in the environment of seafarers that adds to their risk behavior is the pressure from other seafarers in areas such as drinking and having sex with female sex workers or casual partners as there is easy access (Ford and Chamratrithirong, 2008).

A study on fishermen in Ranong province showed that approximately 82% of respondents had used alcohol and approximately 60% went to the brothel in a drunk state. Around 11% of respondents had sex with male sex workers, and around 63% of respondents had sex with female sex worker. The number of respondents who reported always using condom when having sex with female sex worker was 70.7% (Maler Htoo, 2009).

Another study also on fishermen in Ranong province showed that in those respondents who had sexual intercourse in the past 12 months, 63.1% reported having sex with female sex workers and 33.9% of them inconsistently used condoms with female sex workers. This study shows that migrant fishermen are an important bridge for HIV transmission in the community (Hu, 2004).

2.4. Research hypotheses

Fishermen who have poor knowledge about HIV/AIDS are more likely to have sexual risk behavior.

Fishermen who have low perception about the risk of HIV infection are more likely to have sexual risk behavior.

2.5. Conceptual framework

This thesis applies the "Health Belief Model" to explain factors related to sexual risk behavior among fishermen.

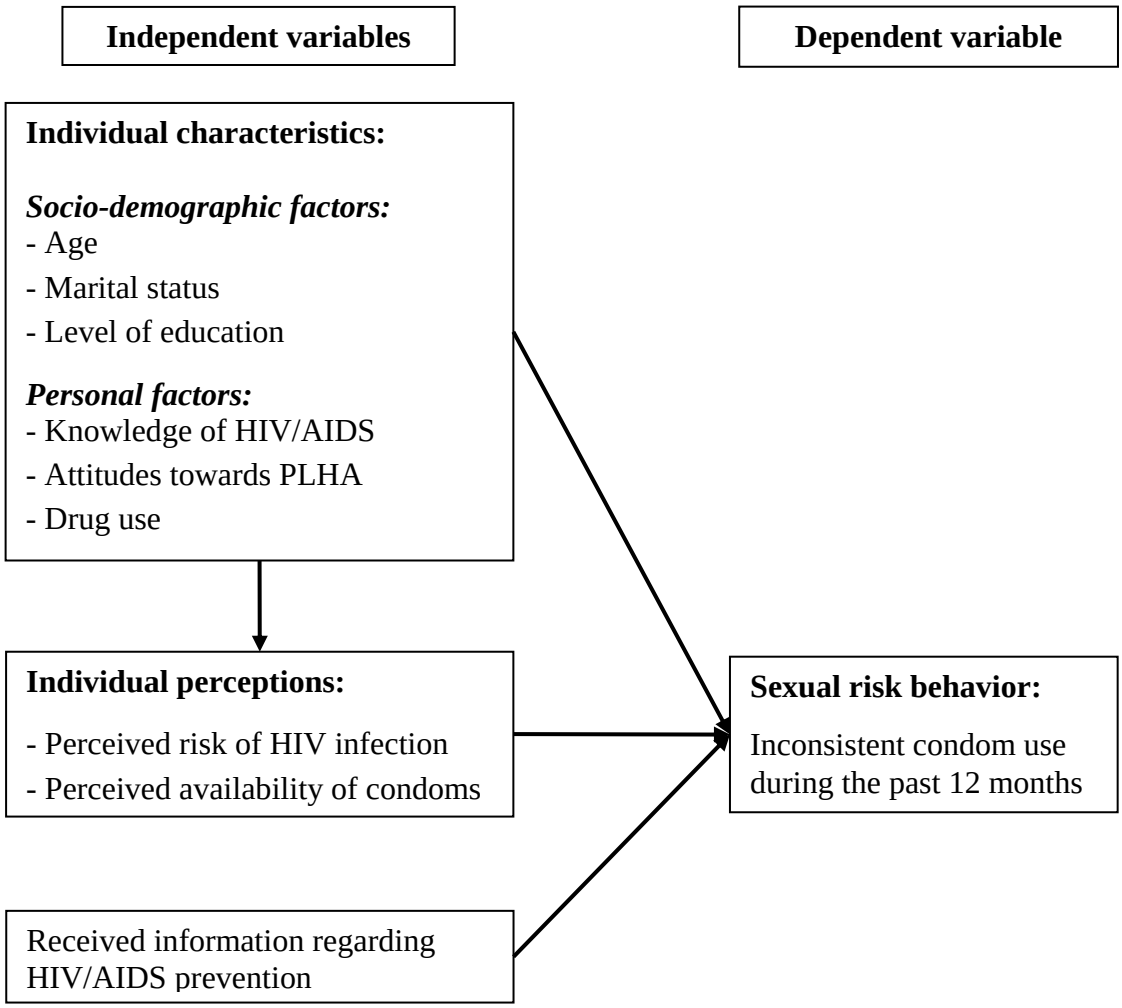

Figure 2.2. Conceptual framework

CHAPTER III
RESEARCH METHODOLOGY

3.1. Source of data, and sample size of research

The study employs secondary data from a cross sectional survey "The survey on knowledge, attitude, behavior (KAB) on HIV/AIDS prevention among fishermen in some Central provinces, Vietnam, 2008-2009" conducted by the Nhatrang Pasteur Institute, Vietnam.

The objectives of this survey are: to describe characteristics of knowledge, attitude, behavior related to HIV/AIDS prevention and to propose a model of intervention for HIV/AIDS control and prevention among fishermen in some Central provinces, Vietnam.

This survey was conducted with fishermen (15 year old and over) who were away from home over 7 days per month and who were currently living in Binh Dinh and Binh Thuan provinces.

Simple random sampling method was used to collect the sample. The sampling frame was developed by listing the 22 big fishing ports in Binh Dinh and Binh Thuan provinces. Then 3 fishing ports were randomly selected from the list. From each fishing port, ten boats were randomly selected from the boats that were ashore at the time of the survey. In each boat there were approximately 10 to 15 fishermen. Using simple random sampling, 7 fishermen were selected from each boat for face to face interview. Thus, the total number selected was 210 fishermen. However, the actual number of the respondents was 208 because two fishermen refused to interview.

The subgroup for this research are the fishermen who have ever had sex with non-regular sexual partners (includes casual sexual partners and female sex workers) in the past year. Therefore, for the purpose of there were 134 fishermen selected for analysis.

Figure 3.1. Survey site

3.2. Research instrument

The structured interview questionnaire for the KAB survey included:

- Personal information and the level of access to the media on HIV/AIDS
- Drug use
- Sexual behavior: the number and types of sexual partners, sexual behaviors and condom use
- Knowledge, opinions and attitudes on HIV/AIDS
- Experience with sexually transmitted infections

3.3. Ethical aspects

Before conducting interviews, research subjects were introduced to the purpose of the study. Research subjects could refuse to participate in the research and the information obtained from this survey was completely confidential. Research subjects could decline answering the questions that they did not want to answer.

3.4. Operational definition

Variables	Operational definition	Level of measurement	Concept related to HBM
Independent variables			
Age	Age of fishermen at time of survey. 0 = less than 29 1 = 30-34 2 = 35-39 3 = more than 40	Ordinal	Demographic characteristics
Marital status	Marital status of fishermen at time of survey. 0 = Single 1 = Married	Nominal	
Education	Highest level of education of fishermen at time of survey. 0 = Primary school 1 = Secondary school and higher	Ordinal	
Knowledge of HIV/AIDS	The fisherman's knowledge of HIV/AIDS. 1. Can having sex with only one faithful, uninfected partner reduce the risk of HIV transmission? 2. Can using condoms reduce the risk of HIV transmission? 3. Can a healthy-looking person have HIV? 4. Can a person get HIV from mosquito bites? 5. Can a person get HIV by sharing a meal with someone who is infected? If the fishermen could answer total 5 questions correctly, it will be defined as having good knowledge; otherwise, it will be defined as having poor knowledge (MOH, 2007). 0 = Poor knowledge 1 = Good knowledge	Nominal	Knowledge

Variables	Operational definition	Level of measurement	Concept related to HBM
Attitude towards PLHA	The fisherman's attitude towards PLHA. 1. Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had AIDS? 2. If a member of your family got infected with HIV, would you want it to remain a secret or not? 3. If a member of your family became sick with the virus that causes AIDS, would you be willing to care for her/him in your own household? 4. In your opinion, if a teacher has HIV but is not sick, should she/he be allowed to continue teaching in the school? If the fishermen could answer total 4 questions correctly, it will be defined as having positive attitude; otherwise, it will be defined as having negative attitude (MOH, 2007) 0 = Negative attitude 1 = Positive attitude	Nominal	Personality
Drug use	Respondent had ever used drug. 0 = No 1 = Yes	Nominal	Personality
Perceived risk of HIV infection	Respondent perceived he could be infected HIV. 0 = No or unknown 1 = Yes	Nominal	Perceived susceptibility
Perceived availability of condoms	Respondent knew where he could buy condom. 0 = No 1 = Yes	Nominal	Perceived barrier
Received information regarding HIV/AIDS prevention	Respondent received information regarding HIV/AIDS prevention from HIV/AIDS prevention program. 0 = No 1 = Yes	Nominal	Perceived benefit

Variables	Operational definition	Level of measurement	Concept related to HBM
Dependent variable			
Inconsistent condom use for sexual intercourse	Action of the fisherman who has sexual intercourse without consistent condom use during the past 12 months with non-regular sexual partners. 0 = Consistent condom use 1 = Inconsistent condom use (Non-regular sexual partners in this study include casual sexual partners and female sex workers. Female sex workers refer to partners with whom respondent had sex in exchange for money; casual partners refer to sexual partners that respondent is not married to and has never lived with and did not pay)	Nominal	Likelihood of behavior change

3.5. Methods

Univariate analysis:

The study first examines the distribution of single variables by frequencies, percentage, mean, median, min, max, and standard deviation.

Bivariate analysis:

The Pearson's Chi-square test (X^2) will be used to examine the relationship between individual characteristics and individual perceptions, and between all three categories and sexual risk behavior, as shown in the conceptual framework.

Multivariate analysis:

Binary logistic regression will be used to examine the relationship between knowledge on HIV/AIDS, perceived risk of HIV infection and sexual risk behavior.

3.6. Limitations of the study

The data for this study are from a cross sectional survey. The sampling strategy was designed to obtain a representative sample of fisherman who were in port

at the time of the survey. For this reason, the sample may be biased towards fisherman who are at sea for shorter periods. The sample size is small with 134 fishermen who had sexual activities with non-regular sexual partners during the last 12 months. In addition, there is a limitation in the availability of data on other factors that may affect sexual risk behaviour but were not collected in the survey (for example: alcohol use or injecting drug use of fishermen).

This study did not have a chance to conduct qualitative research for further analysis, such as exploring the reasons that fishermen engage in unsafe sex practice with their non-regular sex partners in more depth.

CHAPTER IV
RESULTS AND DISCUSSION

This chapter presents the findings from the data analysis and is divided into two major sections: results (includes univariate analysis, bivariate analysis and multivariate analysis) and discussion.

4.1. Univariate Analysis

Univariate analysis includes the use of frequency, percentage distribution of the respondent's socio-demographic characteristics (age, level of education, marital status), personal factors (knowledge of HIV/AIDS, attitude towards PLHA, ever drug use), individual perceptions (self-perceived risk of HIV infection, perceived availability of condom), whether the respondent received information regarding HIV/AIDS prevention, and condom use with non-regular sexual partners.

4.1.1. Socio-Demographic characteristics

Table 4.1. Socio-demographic characteristics of fishermen

Characteristics		Frequency	Percentage
Age			
	≤29	58	43.3
	30-34	21	15.7
	35-39	31	23.1
	≥40	24	17.9
	Total	*134*	*100*
Mean = 33.2; median = 32; min = 17; max = 57; SD = 7.75			
Education			
	Primary school	78	58.2
	Secondary school and higher	56	41.8
	Total	*134*	*100*
Marital status			
	Single	28	20.9
	Married	106	79.1
	Total	*134*	*100*

Table 4.1 showed the socio-demographic characteristics of the fishermen in Binh Dinh and Binh Thuan provinces, Vietnam. The mean age of fishermen was 33.2, although ages ranged from 17 to 57, though 43.3% of the fishermen were below the age of 30 years. Fishermen in this study had low education level with 58.2% of them having primary education, 41.8% secondary and higher education levels. Of all the respondents 20.9% of them were currently single (including single, separated, divorced, or widowed) and 79.1% were currently married.

4.1.2. Personal factors

Table 4.2. Knowledge of HIV/AIDS, attitude towards PLHA and drug use of fishermen

Characteristics	Frequency	Percentage
Knowledge of HIV/AIDS		
Poor (1-4 scores)	46	34.3
Good (5 score)	88	65.7
Total	*134*	*100*
Mean = 4.5; min = 1; max = 5; SD = 0.9		
Attitude towards PLHA		
Negative (1-3 score)	63	47.0
Positive (4 score)	71	53.0
Total	*134*	*100*
Mean = 3.1; min = 1; max = 4; SD = 1.1		
Drug use		
No	117	87.3
Yes	17	12.7
Total	*134*	*100*

The level of knowledge on HIV/AIDS was classified into two categories: poor knowledge (0-4 scores) and good knowledge (5 scores). Table 4.2 shows that 34.3% of fishermen in this study have poor HIV/AIDS knowledge and 65.7% of fishermen have good HIV/AIDS knowledge. On the average fisherman reached a score of 4.5 out of a total of 5, regarding to HIV/AIDS knowledge.

Fishermen have good knowledge about HIV/AIDS prevention as the proportion is quite high at 65.7%, and can be explained because behavior change communication program for the community through different channels have been

strong and over a long period in Binh Thuan and Binh Dinh provinces through the active participation of organizations, individuals and NGOs.

Attitudes towards PLHA were classified into two categories: negative attitude (0-3 scores) and positive attitude (4 scores), with 47% of fishermen having more negative attitudes and 53% of fishermen with more positive attitudes towards PLHA. On average, fisherman scored a 3.1 out of a total of 4 in regards to attitude towards PLHA.

Regarding drug use, 12.7% of respondents had used drugs, but all of the fishermen responded that they did not inject drugs.

4.1.3. Individual perceptions, and whether the respondent received information regarding HIV/AIDS prevention

Table 4.3. Self perceived risk of HIV infection, perceived availability of condom, and whether the respondent received information regarding HIV/AIDS prevention

Characteristics	Frequency	Percentage
Self perceived risk of HIV infection		
No	43	32.1
Yes	91	67.9
Total	*134*	*100*
Perceived availability of condom		
No	27	20.2
Yes	107	79.8
Total	*134*	*100*
Received information regarding HIV/AIDS prevention		
No	26	19.4
Yes	108	80.6
Total	*134*	*100*

When questioned to assess whether they are at risk of getting HIV/AIDS, 67.9% of fishermen admitted that they were at risk, and 32.1% of fishermen thought that they were not risk of HIV infection. Table 4.3 revealed that 79.8% of the respondents knew where to get condom and 80.6% of the respondents received information regarding HIV/AIDS prevention.

Table 4.4. Sexual risk behavior of fishermen (condom use with non-regular partners)

Characteristics	Frequency	Percentage
Condom use with non-regular sex partners		
Inconsistent	37	27.6
Consistent	97	72.4
Total	*134*	*100*

Table 4.4 shows condom use with non-regular sex partners during the last 12 months, result indicate that 72.4% of fishermen use condom consistently and 27.6% of fishermen are using condom inconsistently.

4.2. Bivariate Analysis

4.2.1. Relationship between individual characteristics, individual perceptions, whether the respondent received information regarding HIV/AIDS prevention and sexual risk behavior

4.2.1.1. Relationship between socio-demographic factors and sexual risk behavior (condom use with non-regular sex partners)

Table 4.5. Socio-demographic characteristics and condom use of fishermen (n=134)

Characteristics	Condom use with non-regular partners in the last 12 months			Chi-Square (X^2)	P-value
	Consistent % (n)	Inconsistent % (n)	Total % (n)		
Age					
≤29	79.3 (46)	20.7 (12)	100 (58)	2.97	0.39
30-34	61.9 (13)	38.1 (8)	100 (21)		
35-39	71.0 (22)	29.0 (9)	100 (31)		
≥40	66.7 (16)	33.3 (8)	100 (24)		

Table 4.5. Socio-demographic characteristics and condom use of fishermen (cont.)

Characteristics	Condom use with non-regular partners in the last 12 months			Chi-Square (X^2)	P-value
	Consistent % (n)	Inconsistent % (n)	Total % (n)		
Education					
Primary school	71.8 (56)	28.2 (22)	100 (78)	0.03	0.86
Secondary and higher	73.2 (41)	26.8 (15)	100 (56)		
Marital status					
Single	75.0 (21)	25.0 (7)	100 (28)	0.12	0.73
Married	71.7 (76)	28.3 (30)	100 (106)		

In terms of age, data showed that the proportion of inconsistent condom use of fishermen in the age group 30-34 was the highest (38.1%), followed up by fishermen in the age group more than 40 years old (33.3%). There is no significant association between age and condom use (X^2=2.97, p=0.39)

Regarding education level, 28.2% of fishermen who have primary school have inconsistent condom use vs. 26.8% of fishermen who have secondary school and higher. There is no significant association between education level and condom use (X^2=0.03, p=0.86)

For fishermen's marital status, 28.3% of fishermen who are currently married have inconsistent condom use vs. 25% of fishermen who are currently single. There is no significant association between marital status and condom use (X^2=0.12, p=0.73)

4.2.1.2. Relationship between personal factors and sexual risk behavior (condom use with non-regular sexual partners)

Table 4.6. Personal factors and condom use of fishermen (n=134)

Characteristics	Condom use with non-regular partners in the last 12 months			Chi-Square (X^2)	P-value
	Consistent % (n)	Inconsistent % (n)	Total % (n)		
Knowledge of HIV					
Poor	45.6 (21)	54.4 (25)	100 (46)	25.05	<0.001
Good	86.4 (76)	13.6 (12)	100 (88)		
Attitude towards PLHA					
Negative	68.2 (43)	31.8 (20)	100 (63)	1.02	0.31
Positive	76.1 (54)	23.9 (17)	100 (71)		
Drug use					
No	76.1 (89)	23.9 (28)	100 (117)	6.25	0.012
Yes	47.1 (8)	52.9 (9)	100 (17)		

Table 4.6 demonstrates that 13.6% of fishermen who have good knowledge have inconsistent condom use vs. 54.4% of fishermen who have poor knowledge. There is an association between knowledge on HIV/AIDS and condom use with non-regular sex partners among fishermen (X^2=25.05, p<0.001).

Regarding attitudes towards PLHA, 76.1% of fishermen who have positive attitudes have consistent condom use vs. 68.2% of fishermen who have negative attitudes. There is no significant relationship between attitudes towards PLHA and condom use of fishermen (X^2=1.02, p=0.31).

In relation to drug use of fishermen, 52.9% of fishermen who ever used drugs have inconsistent condom use vs. 23.9% of fishermen who don't drug use. There is an association between drug use and condom use with non-regular sex partners among fishermen (X^2=6.25, p=0.012).

4.2.1.3. Relationship between individual perceptions, whether the respondent received information regarding HIV/AIDS prevention and sexual risk behavior (condom use with non-regular sexual partners)

Table 4.7. Individual perceptions, whether the respondent received information regarding HIV/AIDS prevention and condom use of fishermen (n=134)

Characteristics	Condom use with non-regular partners in the last 12 months			Chi-Square (X^2)	P-value
	Consistent % (n)	Inconsistent % (n)	Total % (n)		
Self perceived risk of HIV infection					
No	37.2 (16)	62.8 (27)	100 (43)	39.20	<0.001
Yes	89.0 (81)	10.0 (10)	100 (91)		
Perceived availability of condom					
No	44.4 (12)	55.6 (15)	100 (27)	13.21	<0.001
Yes	79.4 (85)	20.6 (22)	100 (107)		
Received information regarding HIV/AIDS prevention					
No	26.9 (7)	73.1 (19)	100 (26)	33.36	<0.001
Yes	83.3 (90)	16.7 (18)	100 (108)		

Table 4.7 conveys that 10% of fishermen who have self perceived risk of HIV infection have inconsistent condom use vs. 62.8% of fishermen who don't have self perceived risk of HIV infection. There is an association between self perceived

risk of HIV infection and condom use with non-regular sex partners among fishermen (X^2=39.20, p<0.001).

Regarding perceived availability of condoms, 20.6% of fishermen who have perceived availability of condoms have inconsistent condom use vs. 55.6% of fishermen who don't have perceived availability of condoms. There is an association between perceived availability of condoms and condom use with non-regular sex partners among fishermen (X^2=13.21, p<0.001).

Regarding information received regarding HIV/AIDS prevention, 16.7% of fishermen who have received information regarding HIV/AIDS prevention have inconsistently used condom vs. the 73.1% of fishermen who did not receive information regarding HIV/AIDS prevention. Again there is an association between receiving information regarding HIV/AIDS prevention and condom use behavior with non-regular sex partners among fishermen (X^2=33.36, p<0.001).

4.2.2. Relationship between individual characteristics and individual perceptions

Table 4.8. Knowledge of HIV/AIDS and self perceived risk of HIV infection of fishermen (n=134)

Characteristics	Self perceived risk of HIV infection			Chi-Square (X^2)	P-value
	No % (n)	Yes % (n)	Total % (n)		
Knowledge of HIV					
Poor	54.4 (25)	45.6 (21)	100 (46)	15.92	<0.001
Good	20.4 (18)	79.6 (70)	100 (88)		

Table 4.8 showed that 79.6% of fishermen who have good knowledge have self perceived risk of HIV infection vs. 45.6% of fishermen who have poor knowledge, with an association between knowledge on HIV/AIDS and self perceived risk of HIV infection of fishermen (X^2=15.92, p<0.001).

Table 4.9. Knowledge of HIV/AIDS and perceived availability of condom of fishermen (n=134)

Characteristics	Perceived availability of condom			Chi-Square (X^2)	P-value
	No % (n)	Yes % (n)	Total % (n)		
Knowledge of HIV					
Poor	47.8 (22)	52.2 (24)	100 (46)	33.35	<0.001
Good	5.7 (5)	94.3 (83)	100 (88)		

Table 4.9 showed that 94.3% of fishermen who have good knowledge have perceived availability of condom vs. 52.2% of fishermen who have poor knowledge. There is an association between knowledge on HIV/AIDS and perceived availability of condom of fishermen (X^2=33.35, p<0.001).

4.3. Multivariate Analysis

To examine the net effect of the independent variables (age, education, marital status, knowledge on HIV/AIDS, attitude towards PLHA, drug use, self perceived risk of HIV infection, perceived availability of condom, and whether the respondent received information regarding HIV/AIDS prevention) on sexual risk behavior (as measured by inconsistent condom use of fishermen), the binary logistic regression model was used. This is because the outcome variables have two categories: inconsistent condom use and consistent condom use.

However, an examination of the bivariate correlation matrix between independent variables showed that perceived availability of condoms is correlated closely with having received information regarding HIV/AIDS prevention (r=0.74, p<0.001). Also, knowledge on HIV/AIDS is correlated closely with receiving information regarding HIV/AIDS prevention (r=0.68, p<0.001). Therefore, two variables were eliminated (perceived availability of condom and whether the respondent received information regarding HIV/AIDS prevention) from the logistic model to avoid multicollinearity among independent variables, which can affect

greatly the outcome of binary regression model analysis by making the estimates of the coefficients unstable. The results of binary regression model are presented in table 4.10. For this analysis a level of significance of $p<0.05$ was considered statistically significant.

Table 4.10. Logistic regression analysis of characteristics for using condom inconsistently with non-regular sex partners among fishermen

Characteristics	Inconsistent condom use		
	Coefficient	Odds ratio	S.E
Age	0.03	1.03	0.04
Education			
Primary school (reference group)			
Secondary school and higher	-0.08	0.92	0.51
Marital status			
Currently single (reference group)			
Currently married	-0.31	0.73	0.71
Knowledge on HIV/AIDS			
Poor (reference group)			
Good	-1.63	0.19**	0.53
Attitude towards PLHA			
Negative (reference group)			
Positive	-0.87	0.42†	0.52
Drug use			
No (reference group)			
Yes	0.35	1.41	0.69
Self-perceived risk of HIV infection			
No (reference group)			
Yes	-2.36	0.10***	0.53
Number of observers		134	
LR chi square		53.4	
Pseudo R square		0.34	

*Note: † p<0.10; ** p< 0.01; *** p< 0.001*

The results of the logistic regression model show that age, education, marital status, knowledge on HIV/AIDS, attitude towards PLHA, drug use, and self-perceived risk of HIV infection together explain the variation of inconsistent condom use with non-regular partners among fishermen by 34% at 0.001 of significant level. Specifically, looking at the effects of the independent variables on inconsistent condom use, table 4.10 indicates that knowledge on HIV/AIDS, and self-perceived risk of HIV infection were significantly associated with inconsistent condom use. Fishermen who had good knowledge were 81% less likely to have inconsistent condom use than fishermen who had poor knowledge ($p<0.01$). Similarly, fishermen who had self-perceived risk of HIV infection were 90% less likely to have inconsistent condom use than fishermen who do not have self-perceived risk of HIV infection ($p<0.001$).

The small sample size (n=134) may be one of the feasible explanations for the lack of significant results. Age, education level, marital status, and drug use did not show a significant relationship with condom use at 0.05 levels. However, the multivariate model shows that fishermen who had positive attitudes were 58% less likely to have inconsistent condom use than fishermen who had negative attitudes ($p<0.10$).

4.4. Simulation results

In order to examine how completely the model accounts for variation in patterns of fishermen's sexual risk behavior, we compare the difference between exposed or not with knowledge on HIV and perceived risk of HIV infection among fishermen. Based on the logistic regression model the study used prediction and simulation to calculate the values of predictors after excluding variables that did not have actual effect on the dependent variable. The following figures present the predicted probability of occurring sexual risk behavior.

Figure 4.1 displays effects of HIV/AIDS knowledge on inconsistent condom use. In the hypothetical situation that all fishermen have poor knowledge, the predicted proportion of fishermen using condoms inconsistently would be 42.3%.

Contrary to this, in the hypothetical situation of all fishermen having good knowledge, the predicted proportion of fishermen using condoms inconsistently decreases to 18.0%. The results suggest that HIV/AIDS knowledge affects inconsistent condom use among fishermen.

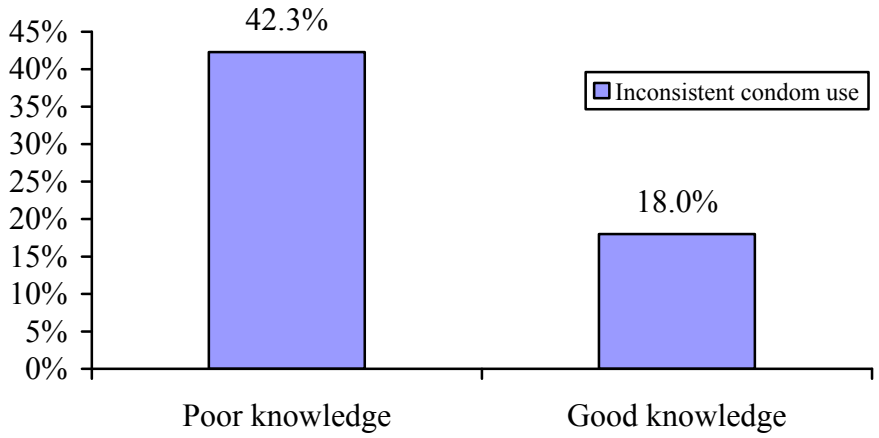

Figure 4.1. Effect of HIV/AIDS knowledge on inconsistent condom use of fishermen

Similarly, figure 4.2 displays effects of self-perceived risk of HIV infection on inconsistent condom use. In the hypothetical situation of no fishermen have self-perceived risk of HIV infection, the predicted proportion of fishermen using condom inconsistently would be 53.5%.

Conversely, in the hypothetical situation that all fishermen have self-perceived risk of HIV infection, the predicted proportion of fishermen using condom inconsistently decreases to 13.5%. The results suggest that self-perceived risk of HIV infection has an affect on inconsistent condom use among fishermen.

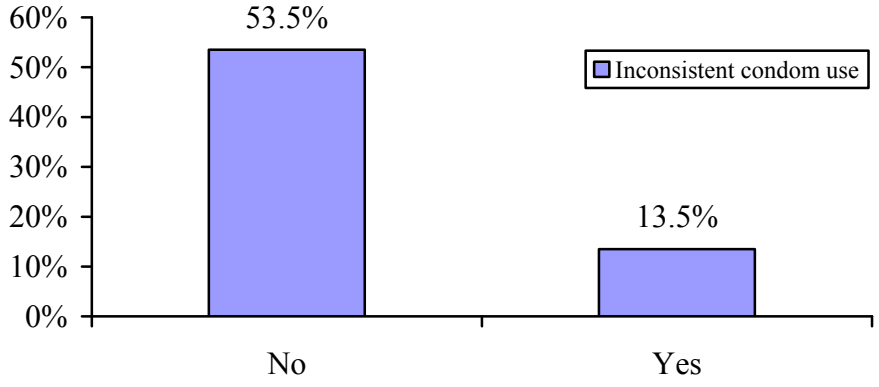

Figure 4.2. Effect of self-perceived risk of HIV infection on inconsistent condom use of fishermen

4.5. Discussion

Results of the study reveal that fishermen were mainly in the 17-29 years age group (43.3%). The reason may be due to occupational characteristics, such as the hard work associated with being a fishermen. The age of the majority of fishermen was between 15-35 years old, a time when sexual activity may be most frequent, and therefore the most vulnerable with HIV/STIs (Kher, 2008). However, there was no statistically significant association between age and sexual risk behavior of fishermen with non-regular sex partners in this study.

Fishermen in this study had low education levels with 58.2% of them having primary education level compared with 80% seafarers in Songkhla and Samutsakhon provinces (Rojnkureesatien, 2006) and 47.8% Myanmar migrant fishermen in Ranong province (Hu, 2004). The evidence and theories show that people with more education are more likely to practice safer sex in regards to HIV/AIDS prevention (Kher, 2008). This study may suggest that information about HIV/AIDS/STI prevention should be adjusted to be understandable and acceptable for fishermen, especially in terms of simple language and employing direct education methods.

This study shows that 34.3% of fishermen had poor HIV/AIDS knowledge and 54.4% fishermen who had poor knowledge of HIV/AIDS inconsistently used condom with non-regular sex partners. There is association between knowledge on HIV/AIDS and condom use with non-regular sex partners among fishermen. Fishermen who had good knowledge were 81% less likely to have inconsistent condom use than fishermen who had poor knowledge ($p<0.01$). Similarly, a study on fishermen in Ranong province showed that HIV/AIDS knowledge correlated with consistent condom use when having sex ($p<0.05$) (Hu, 2004). This may suggest that lots of work should be done to improve knowledge and information in regards to HIV among fishermen in Binh Dinh and Binh Thuan provinces. This study also showed that knowledge on HIV/AIDS were associated with self-perceived risk of HIV infection and perceived availability of condom of fishermen ($p<0.001$).

Regarding attitude towards PLHA, result showed that there is significant relationship between attitude towards PLHA and condom use of fishermen. Fishermen who had positive attitude were 58% less likely to have inconsistent condom use than fishermen who had negative attitude ($p<0.10$). Results from several studies demonstrate a significant relationship between attitudes towards PLHA and sexual behavior. Result from a study on fishermen in Ranong province showed an association between negative attitude towards PLHA and unsafe sexual behavior with female sex workers ($p<0.001$) (Maler Htoo, 2009). Another study with Myanmar migrants in Samutsakhon province revealed that positive attitude towards PLHA related significantly with condom use during non-marital sex ($p<0.05$) (Thu, 2003).

For drug use of fishermen, 52.9% of fishermen who have ever drugs use have inconsistent condom use vs. 23.9% of fishermen who have not used drugs. There is association between drug use and condom use with non-regular sex partners of fishermen ($p=0.012$). Another study on fishermen showed that the relevance has statistical significance between drug use and unsafe sexual behavior ($p=0.006$) (Maler Htoo, 2009). This may suggest that addictive drug use could be one of the reasons for increasing sexual risk behavior among fishermen.

Result of study showed that proportions of consistent condom use of fishermen who had perceived risk of HIV infection (89%) was higher than proportions of consistent condom use of fishermen with no perceived risk of HIV infection (37.2%). Self perceived risk of HIV infection was significantly associated with inconsistent condom use and fishermen who had self-perceived risk of HIV infection were 90% less likely to have inconsistent condom use than fishermen who have no self- perceived risk of HIV infection ($p<0.001$). Some studies on seafarers in Thailand also indicate that perceived risk of HIV infection related to sexual risk behavior, and seafarers often have low perception about the risk of HIV infection (Ford and Chamratrithirong, 2008; Rojnkureesatien, 2006).

In regards to this study the proportion of consistent condom use of fishermen who know where to get a condom (79.4%) was higher than proportions of consistent condom use of fishermen who did not know where to get condom (44.4%). Similarly, the proportion of consistent condom use for fishermen who received

information regarding HIV/AIDS prevention (83.3%) was higher than the proportion of consistent condom use of fishermen who did not received information regarding HIV/AIDS prevention (26.9%). Perceived availability of condom, and receiving information regarding HIV/AIDS prevention were associated with condom use behavior of fishermen ($p<0.001$). These results were consistent with the previous studies among migrant fishermen in Ranong, Thailand. Fishermen consistent condom use when having sex with female sex workers are more likely to know where to get condoms at pharmacy (drug store) rather than fishermen who inconsistently use with female sex workers. Also, fishermen who consistently use condoms with female sex workers are more likely to receive information about HIV/STI prevention than fishermen with inconsistent condom use with female sex workers. Perceived availability of condom and receiving information regarding HIV/AIDS prevention was statistically associated with safe sex with sex workers ($p<0.01$) (Hu, 2004).

CHAPTER V
CONCLUSION AND RECOMMENDATION

5.1. Conclusion

The objective of this study was to describe independent variables (age, marital status, level of education, knowledge on HIV/AIDS, attitudes towards PLHA, drug use, self-perceived risk of HIV infection, perceived availability of condoms, whether the respondent received information regarding HIV/AIDS prevention), and to assess any association of these factors with sexual risk behavior with non-regular sex partners among fishermen in Binh Dinh and Binh Thuan provinces, Vietnam.

Results from bivariate analysis of this research showed that knowledge on HIV/AIDS, drug use, self-perceived risk of HIV infection, perceived availability of condoms, and receiving information regarding HIV/AIDS prevention were associated with inconsistent condom use of fishermen when having sex with non-regular partners ($p<0.05$).

In results of multivariate analysis showed that knowledge on HIV/AIDS, attitude towards PLHA, and self perceived risk of HIV infection were significantly associated with inconsistent condom use of fishermen when having sex with non-regular partners. Fishermen who had good knowledge were 81% less likely to have inconsistent condom use than fishermen who had poor knowledge ($p<0.01$). Similarly, fishermen who had self-perceived risk of HIV infection were 90% less likely to have inconsistent condom use than fishermen who did not self- perceived risk of HIV infection ($p<0.001$). Fishermen who had positive attitude were 58% less likely to have inconsistent condom use than fishermen who had negative attitude ($p<0.10$).

In conclusion, the factors including good knowledge of HIV/AIDS, positive attitude towards PLHA, and self-perceived risk of HIV infection were associated with lower sexual risk behavior. Specifically, good knowledge of

HIV/AIDS, positive attitude towards PLHA, and self-perceived risk of HIV infection were associated with lower inconsistent condom use of fishermen when having sex with non-regular partners (including casual partners and female sex workers).

5.2. Recommendations for HIV/AIDS prevention program

Results of research should be used to advocate policy makers and other stakeholders for better understanding about factors related to sexual risk behavior of fishermen and providing more effective and practical support for prevention programs to reduce the impact of HIV/AIDS epidemic among this group in Binh Dinh and Binh Thuan provinces.

The findings in this study lead to the recommendation that HIV/AIDS knowledge and self-perceived risk of HIV infection has a significantly positive effect on fishermen's condom use behavior. The influence of HIV/AIDS knowledge and self-perceived risk of HIV infection should continue to be emphasized when designing interventions programs for fishermen. The study findings identify an important challenge to HIV/AIDS intervention programs attempting to change HIV-related behavior among fishermen. Intervention programs should focus on behavior change communication to provide knowledge on HIV/AIDS for fishermen through multiple-channels such as peer educator, health workers, radio, newspaper, TV, etc. Health education agencies and NGOs should cooperate in providing health education and raising awareness of fishermen. Additionally, health education agencies should provide life skills training such as refusing to have sex without condoms and discussing condom use as a vital method for prevention of HIV transmission among fishermen. Media boxes could be put at convenient locations of the big fishing ports that the fishermen can easily access and use. (A media box is a box that includes leaflets, booklets providing basic information about HIV/AIDS prevention and condoms).

The "100% Condom Use Program" should be extensively strengthened to promote condom use among fishermen and their partners as well as limit the spread of HIV among them. The program should make sure the availability and accessibility of condom by strengthening activities to disseminate condoms. Particularly, condom

distribution should be promoted through multiple-channels such as peer educator, commune health station, pharmacy, clubs, hotels and condom automatic-vending machine. It should be recommended to fishermen that correct and consistent use of condom when having sex with sex workers and casual partners is very important for HIV/AIDS prevention.

5.3. Recommendations for further research

Perhaps due to the small sample size, this study could not demonstrate the relationship that they ought to have for some factors. Therefore, it is necessary to include larger sample sizes in future studies.

Further studies should focus on gaining more insight into other factors, such as alcohol consumption. Information from quantitative research seems to be inadequate to explain the deeper reasons of sexual risk behavior among fishermen. A combination of qualitative and quantitative studies are needed in order to further explore reasons they engage in unsafe sex practices with their non-regular sex partners.

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APPENDIX

Some selected questions from the questionnaire that are used in this study:

Code of questions	Question	Code of answers
C102	In what year were you born?	Year /___/___/___/___/
C106	What is your highest education level?	1 = Primary (1-5 level) 2 = Secondary (6-9 level) 3 = High school (10-12 level) 4 = College/University
C203	What is your marital status?	1 = Singe 2 = Living with wife 3 = Living together without marriage 4 = Separate 5 = Divorce 6 = Widow/Widower
C402	Answer these question with your own opinion: 1. Can having sex with only one faithful, uninfected partner reduce the risk of HIV transmission? 2. Can using condoms reduce the risk of HIV transmission? 3. Can a healthy-looking person have HIV? 4. Can a person get HIV from mosquito bites? 5. Can a person get HIV by sharing a meal with someone who is infected?	 (1). 1 = Yes; 2 = No (2). 1 = Yes; 2 = No (3). 1 = Yes; 2 = No (4). 1 = Yes; 2 = No (5). 1 = Yes; 2 = No
C429	Answer these question with your own attitude: 1. Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had AIDS? 2. If a member of your family got infected with HIV, would you want it to remain a secret or not? 3. If a member of your family became sick with the virus that causes AIDS, would you be willing to care for her/him in your own household? 4. In your opinion, if a teacher has HIV but is not sick, should she/he be allowed to continue teaching in the school?	 (1). 1 = Yes; 2 = No (2). 1 = Yes; 2 = No (3). 1 = Yes; 2 = No (4). 1 = Yes; 2 = No

Code of questions	Question	Code of answers
C301	Do you have ever used drugs?	1 = Yes 2 = No
C304	Do you have ever injected drugs?	1 = Yes 2 = No
C204	***For past 12 months, how many partners have you had sex intercourse*** have you had sex intercourse who are: **Casual sexual partners without payment:** you have sex intercourse with them one time *(not your wife/lover or FSW)* **Female sex workers (FSWs):** is a person you have sex with payment	Number of casual partners: /___/___/ Number of FSWs: /___/___/___/
C215	***For past 12 months,*** do you usually use condoms when you have sex with your casual sexual partners?	1 = Always *(Use every time)* 2 = Almost 3 = Half of times 4 = Sometimes 5 = Never
C220	***For past 12 months,*** did you usually use condoms when you had sex with FSWs?	1 = Always *(Use every time)* 2 = Almost 3 = Half of times 4 = Sometimes 5 = Never
C413	With your current life, do you think you can be infected HIV?	1 = Yes 2 = No 3 = Unknown
C416	Do you have received any information regarding HIV/AIDS prevention communication as below? 1. HIV/AIDS information 2. Hepatitis information 3. Safe injection information 4. Safe sex information 5. Drug detoxication information 6. Gender education information 7. STI information 8. Other information *(Specify)*:…….....	 (1). 1 = Yes; 2 = No (2). 1 = Yes; 2 = No (3). 1 = Yes; 2 = No (4). 1 = Yes; 2 = No (5). 1 = Yes; 2 = No (6). 1 = Yes; 2 = No (7). 1 = Yes; 2 = No (8). 1 = Yes; 2 = No
C440	Do you know where could you buy condom?	1 = Yes 2 = No

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