3rd International Conference on Reproductive Health and Social Sciences Research

August 7, 2009
Krung Thep room1, Royal City Hotel

Organizied by
Institute for Population and Social Research (IPSR), Mahidol University

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Opening Remarks

The 3rd International Conference on Reproductive Health and Social Sciences Research

Assoc. Professor Dr, Sureeporn Punpuing
Director, Institute for Population and Social Research, Mahidol University
7 August 2009

Distinguished quests, Professors, Lectures, colleagues, students from Master Degree Program in Health Promotion, Diponegoro University, Semarang, Indonesia, ladies and Gentlemen

On behalf of the Institute for Population and Social Research, it is my pleasure to be here for the opening the 3rd International Conference on Reproductive Health and Social Sciences Research.

This conference aims to disseminate the results of research in reproductive Health and Social Sciences and provides opportunity for researchers and graduates to share their research with the public and exchange their experiences with each other to enhance research quality.

At this conference, participants from 9 countries in Asia and USA including Thailand will be presenting papers on Reproductive Health, Social and behavioral aspects of HIV/AIDS prevention and Control, Family Planning, Aging, Quality of life, and Maternal and child health. Their different substantially in term of various Population indicators, effect not only fertility levels but also the quality of life of population. It is desirable to raise/lower these indicators to improving quality of life of the population.

To date, the understanding about social and behavioral aspect of HIV/AIDS prevention and control are still below the satisfactory level, despite all academic and technical inputs and resources expended. Also, there still exist a varying degree of success and achievements in family planning and health improvement programs. I hope and expect that papers presented at the Conference will, in some way or another, contribute to better understanding of the issues.

Lastly, I am pleased to note that papers at this Conference will be academically and technically edited by the high level of experts and be published in proceeding of the conference. I wish the conference every success to achieve it stated objectives.

As stated all above, let us now proceed with today conference.

Thank you.

3rd International Conference on Reproductive Health and Social Sciences Research

August 7, 2009 at the Royal City Hotel, Bangkok, Thailand

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1. Rationale

This conference is the third in a series of annual conferences sponsored by the Institute for Population and Social Research (IPSR), Mahidol University and co-supported by the Population and Social Research Development Foundation. It aims to disseminate to the public the results of research in reproductive health and social sciences conducted by researchers and graduate students in these fields. In addition, the proceedings, containing research articles from the conference, will be published, which will help fulfill the requirements of the Commission for Higher Education.

2. Objectives

- To disseminate the results of research in reproductive health and social sciences conducted by researchers and graduate students in these fields.
- To provide an opportunity for graduate students to bring the benefits of their research to the public.
- To enhance research quality.

3. Expected Benefits

This conference is held as one mechanism to ensure the quality of graduate study in Thailand. All papers to be presented in this conference will be reviewed by experts in the field. The papers presented can be used as a partial fulfillment for graduation, according to the regulations of the Commission on Higher Education, Ministry of Education. This event also provides an opportunity for researchers and graduate students to share their research with the public and exchange their experiences with other scholars, which will benefit the development of social science and reproductive health research.

4. Organizer

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Lect. Thomas Edward Blair, Ph.D. (candidate)
Lect. Charamporn Holumyong, Ph.D.

Secretariat: Ms. Luxana Nil-ubol

5. Date and Venue

7 August 2009 at the Royal City Hotel, Bangkok

6. Conference includes

Presentations & discussions

7. Presentation

Full paper

- Research papers submitted for presentations will be in the area of Reproductive Health and Social Sciences Research
- Research abstracts and full papers will be reviewed by reviewers
- Type of presentation: Oral presentation; each oral presentation will be a PowerPoint presentation only and will be limited to 20 minutes, including questions and answers
- Language: English

Abstract

- Abstract in English, no more than 150 words.
- Submission of full paper in English–15 pages, A4 size paper, including figures, tables, references, and appendices. English text should be typed double spaced in Times New Roman, 12 pt font for introduction, objective, methods, results, discussion, conclusion, acknowledgement, and references
- Full paper will be reviewed by reviewers and the accepted paper will be published in the Proceedings of the Conference

8. Important Dates

Deadline for abstract submission :	30 June 2009
Abstract approval:	15 July 2009
Deadline for full paper submission:	25 July 2009
Registration:	1-30 July, 2009

9. Expected attendants

- Researchers and graduate students
- Interested scholars

10. Registration Fee

600 baht for participants from other Institutes; fee includes copy of the Proceedings

11. Contact person for more information

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Oral Presentation Schedule

Conference Program

3rd International Conference on Reproductive Health and Social Sciences Research

August 7, 2009 at the Royal City Hotel, Bangkok, Thailand

Time **Program**

08:00 hrs. – 08:30 hrs. : Registration
08:30 hrs. : Opening Remarks by Assoc.Prof. Dr. Sureeporn Punpuing
09:30 hrs. – 12:10 hrs. : Oral Presentations

Session 1 : Reproductive Health, HIV/AIDS & Health

Time: 08:30 – 12:10 hrs.
Chair: Dr. Yothin Sawangdee & Dr. Pimonpan Isarabhakdi

1) Determinants of consistent condom use among female sex workers in Khanh Hoa province, Vietnam
   Lam Chi Cuong
2) Influence of Internet Exposure to Adolescents' Sexual Attitudes: A Study among Secondary School Students in Semarang, Central Java, Indonesia
   Dyah Anantalia Widyastari
3) Environmental Factors Affecting Risk Behaviors among Injecting Drug Users in Vinhlong Province, Vietnam
   Khuu Van Nghia
4) Factor Influencing Premarital Sex Behaviour of University Student in Central Java
   Ida Susilaksmi & Roro Rukmi
5) Risk behavior among Injecting Drug Users in Thanh Hoa province, Vietnam
   Vo Hai Son
6) Sexual and reproductive health knowledge differential among unmarried adolescents in project and non-project sites of Family Planning Association of Bangladesh
   Farid Alam Khan
7) The Relationship between Obesity and Disability among Older Americans
   Anthony Richard Bardo
8) A Transnational Rite of Passage: Lived Experiences of Thai Students in Perth, Western Australia
   Tannikarn Soonsinpai

12:10 hrs: Lunch

Conference Program

3rd International Conference on Reproductive Health and Social Sciences Research

August 7, 2009 at the Royal City Hotel, Bangkok, Thailand

Time **Program**

Session 2 : Health, Family Planning and Maternal and Child Health

Time: 13:00 – 16:00 hrs.
Chair: Dr. Uraiwan Kanungsukkasem & Dr. Orapin Pitakmahaket

1) Relationship between Child Mortality Experience and Fertility Among Married Women in Lao PDR
   Vilaysook SISOULATH
2) Child Undernutrition and Mortality in KDSS,Thailand
   Munkhzul Zookhuu
3) Impact of mass media on antenatal care (ANC) utilization in Bangladesh
   Firoz Uddin
4) The Factors Affecting Knowledge of Source for Condom in Vietnam 2005
   Dinh Thi Thanh Hoa
5) Impact of Life Changes on Consistent Condom Use Among Thai Male Youth: A Study in Kanchanburi DSS, Thailand
   Wang Dongling
6) Evaluating the Impact of Health Card Program on Access to Reproductive Health Services: An Indonesian Experience
   Erlangga Agustino Landiyanto
7) Women's Quality of Life and the Relationship between Menopausal Symptoms and the Quality of life among Mongolian women in Ulaabaatar city, Mongolia
   Gandolgor Ulziinorov
8) Factors affecting infant mortality in Lao PDR
   Thipsavanh INTHARACK
9) Factors Affecting Antenatal Care Utilization in Afghanistan
   Wali Mohammad Wyar

16:30 hrs: Closing

Proceeding

14) Evaluating the Impact of Health Card Program on Access to Reproductive Health Services: An Indonesian Experience
Erlangga Agustino Landiyanto

15) Women's Quality of Life and the Relationship between Menopausal Symptoms and the Quality of life among Mongolian women in Ulaabaatar city, Mongolia
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17) Factors Affecting Antenatal Care Utilization in Afghanistan
Wali Mohammad Wyar

Determinants of consistent condom use among female sex workers (FSWs) in Khanh Hoa province, Vietnam

Lam Chi Cuong
Master of Arts (Population and Reproductive Health Research), Mahidol University, Thailand

Abstract

This study aims to identify more insights into the determinants of consistent condom use among 600 female sex workers (FSWs) aged 17-55 years in Khanh Hoa, Vietnam. Major results of logistic regression showed that FSWs' HIV/AIDS knowledge and number of sexual partners in the last 6 months were significantly associated with consistent condom use. FSWs admitted being nearly 2 times less likely to use condoms consistently with their regular partners compared to non-regular partners in the last 6 months. Although there was a rather good knowledge about HIV/AIDS, high risk sexual behaviors were still common among FSWs. Many FSWs still engaged in unsafe sex with multiple sexual partners, particularly with regular partners. Additionally, negotiation skill and perceived reliability of condoms were significantly associated with consistent condom use among FSWs. Emphatically, the study findings might point out an important challenge to HIV/STIs intervention programs aimed at achieving consistent condom use in FSWs.

Keywords: Determinants/HIV/AIDS/female sex workers/consistent condom use/regular partners/non-regular partners/Khanh Hoa

Introduction

The HIV epidemic is now growing and has become a huge global threat. The epidemic is currently spreading rapidly in Vietnam and Indonesia (UNAIDS, 2008). According to the UNAIDS 2008 Report on the global AIDS epidemic, "unprotected sex and injecting drug use are the most important risk factors for the spread of HIV in several parts of Asia." According to the Ministry of Health of Vietnam (2007), injecting drug users (IDUs) have the highest HIV prevalence (28.4%) of any group (MOH, 2007), while the 2007 National Sentinel Surveillance showed that HIV prevalence among FSWs is only moderate (4.4%) (MOH, 2007). FSWs are commonly considered as a most-at-risk population (MARP) in that their risk behaviors (unsafe sex practices) make them vulnerable to HIV infection and spread HIV to the general population.

Khanh Hoa province is located on the South Central Coast of Vietnam and is home to 1,135,000 people. Its principle city, Nha Trang, has long been renowned as having one of the 29 most beautiful bays in the world. Consequently, Khanh Hoa has become an increasingly popular and attractive tourist destination in recent years.

As tourism has developed, commercial sex work has also increased (Rosenthal & Oanh, 2006) and is one of the major drivers of the HIV epidemic in Khanh Hoa. Results from Sentinel surveillance of FSWs in Khanh Hoa province shows a ten-fold increase in HIV prevalence among FSWs: from 0.5% in 1996 to 5% in 2006 (Khanh Hoa Provincial Health Department, 2006). In response to the National HIV/AIDS strategy, many

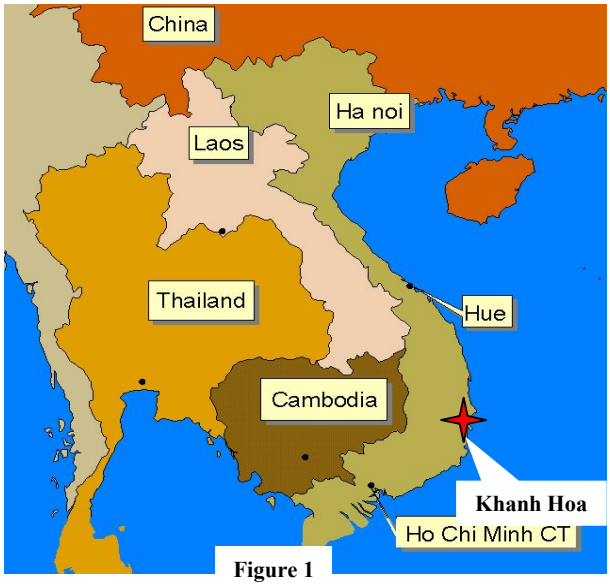

Figure 1

comprehensive prevention programs such as Information, Education and Communication (IEC), Behavior Change Communication (BCC), and condom programs through outreach activities have been implemented throughout the whole province with a view to increasing the knowledge of HIV/AIDS among the general population, particularly MARP groups such as IDUs and FSWs. So far, there have been few studies on assessing determinants of condom use among FSWs with their partners, and those studies were conducted only in Nha Trang City, not in the whole province. Therefore, more supportive programs and further studies of factors determining consistent condom use and risky sexual behaviors of FSWs in Khanh Hoa province are needed. The objective of this study is to identify more insights into determinants of consistent condom use among FSWs in Khanh Hoa province, Vietnam. Not only would the study findings and recommendations provide more

effective and practical support for HIV intervention programs, but they would also contribute to limiting HIV transmission in the province.

Theoretical Models

There have been many previous theoretical models that have been developed, with a view to explaining changes in sexual behavior and their relationship to other factors. Particularly, the Health Belief Model (HBM), one of the first theories of health behavior, and which remains one of the most widely used socio-psychological theories was developed by a group of the U.S. Public Health Service social psychologists in the 1950s. The Model argues that the likelihood that a person will engage in preventive behavior is influenced by related elements such as perceived susceptibility or perceived severity, implying that a person's behavior change depends upon his knowledge and attitude. In short, "the HBM is a good fit for addressing problem behaviors that evoke health concerns (e.g., high-risk sexual behavior and the possibility of contracting HIV)" (MAX, 2007:47). In addition, another theoretical model developed by Catania, Kegeles & Coates is the AIDS Risk Reduction Model (ARRM), with a view to explaining and predicting the individual's behavior change efforts "specifically in relationship to the sexual transmission of HIV/AIDS" (1990). In order to change HIV-related behaviors, the ARRM highlights many possible major factors such as HIV/AIDS knowledge, perception of HIV risk, environmental-structural support, social norms, negotiation skill, sexual relationship, alcohol consumption, drug use, etc. might help to change the individual's attitude and risk behavior. Theories of this study are the combination of both Health Belief Model (HBM) and AIDS Risk Reduction Model (ARRM) that explain HIV-related sexual behavior change (condom use) and its relationship with other factors as above-mentioned. From previous studies, it appears that there are many contextual factors (e.g. socioeconomic factors, and sociocultural factor) and individual factors (e.g. psychological, and emotional factors) affecting sexual related risk taking consistent or inconsistent condom use among FSWs and their clients. These are very important for adopting and sustaining safer sex behaviors among FSWs. Other factors also influence condom use significantly, as concluded in many previous studies, such as alcohol consumption, the kinds of establishment and factors in the workplace, or HIV risk perception. Base on the data, in this study only predisposing factors (age, marital status, educational level, duration of work, and age at first sex), enabling risk factors (HIV/AIDS knowledge, number and type of sexual partners), and reinforcing factors (negotiation skill, accessibility to condoms, perceived reliability of condoms) for testing the relationship of these factors with condom use.

Methodology

Data Source

The data in this study were obtained from a cross-sectional survey conducted by Khanh Hoa Provincial Health Department (Ministry of Health of Vietnam) from July to December, 2007 in Khanh Hoa province, that is located in the Southern Central Coast of Vietnam (**Figure 1**). The survey conducted geographic and social mappings to create a list of FSWs, who were practicing commercial sex work in 5 districts and in the city of Khanh Hoa. A simple random sampling design was employed to select a sample size of 600 FSWs (aged 17-55 years). Respondents were interviewed face to face to obtain information by using a structured questionnaire based on National Guidelines included 6 parts related to respondents' demographic characteristics, exposure to mass media, HIV/AIDS knowledge, attitude towards PLHIV, sexual relationship history, number and type of sexual partners, and injecting drugs and tattooing[1].

Data Analysis

There are two groups of variables namely predictor variables, and outcome variables. Predictor variables in this study were predisposing factors (age, marital status, working experience, education, and age at first sex), enabling risk factors (HIV knowledge and number of sexual partners in the last 6 months), and reinforcing factors (negotiation skill, perceived accessibility to condoms, and perceived reliability of condoms). Consistent condom use with regular partners and consistent condom use with non-regular partners in the last 6 months were treated as outcome variables.

Data analysis was divided into two steps. Firstly, descriptive statistics such as frequency distribution, percentages, means, and standard deviation were applied to describe general characteristics of 600 FSWs. Secondly, since both outcome variables, consistent condom use with regular partners and with non regular partners in the last 6 months are dichotomous in nature (1=consistent and 0=inconsistent), binary logistic regression is an appropriate analysis to identify key determinants of consistent condom use with regular and non-regular partners among FSWs. Adjusted Odd Ratios and 95% Confidence Intervals were calculated to indicate statistical associations at 5% level of significance.

Results

Background characteristics of the respondents

Most study respondents were still young (those aged 20-29 years accounted for nearly 46%), about one-third (33%) aged 30-39 years, with a mean age of 29.4 years. Nearly half (46.3%) were divorced, or separated, followed by single (39.5%). More than half (52%) had completed secondary school, followed by primary school

[1] *This part was not analyzed in this study since only 4 respondents reported had ever used drugs previous to the survey.*

(30.5%), while about 5% reported they had no formal education. The study FSWs were migrants with 42% originally from other provinces, while about 58% were living in Khanh Hoa. More than half (52.4%) reported they had unstable jobs and had to do many different jobs to make their living. Nearly 28% of FSWs were unemployed, and about 4% used to be students before engaging in commercial sex work. Average number of years FSWs had engaged in commercial sex is about three years and more than half (57.2%) had been working as sex workers for 2-5 years. In addition, slightly less than half (45.7%) of the respondents reported that they had never contracted STIs, but more than half (54.3%) admitted that they had experienced at least one symptom compatible with a STI before (see **Table 1**).

Table 1: Percentage distribution of FSWs by general characteristics

Characteristics		Frequency	Percentage
Age (years)	*Mean = 29.4; Median = 28.0; SD = 8.1; Min-Max = 17-55*		
17-19		62	0.3
20-29		275	45.8
30-39		198	33.0
40-55		65	10.9
Marital status			
Single		237	39.5
Married		85	14.2
Divorced/separated/widowed		278	46.3
Having children			
Yes		331	55.2
No		269	44.8
Education			
Illiterate		29	4.8
Primary school		183	30.5
Secondary school		313	52.2
High school or higher		76	12.5
Duration of work (years)	*Mean = 3.0; Median = 2.0; SD = 2.9; Min-Max = 0-30*		
≤ 1		185	30.8
2-5		343	57.2
≥ 6		72	2.0
Place of residence			
Khanh Hoa		346	57.7
Other provinces		254	42.3
Previous occupation			
Peasant		67	11.2
Worker		29	4.8
Pupil/student		23	3.8
Unemployed		167	27.8
Others		314	52.4

Table 1: Percentage distribution of FSWs by general characteristics *(Continued)*

Characteristics	Frequency	Percentage
Have ever got STIs		
Yes	326	54.3
No	274	45.7
Total	**600**	**100.0**

Level of HIV/AIDS knowledge

FSWs in this study had a rather high level of HIV/AIDS knowledge: 69% had good knowledge (the mean score of HIV/AIDS knowledge in this study is 9.8) (see **Table 2).**

Table 2: Percentage distribution of FSWs by level of HIV/AIDS knowledge

Level of HIV/AIDS knowledge		Frequency	Percentage
Good knowledge *(Mean score ≥ 9.8)*	Mean = 9.8 Median = 11.0 SD = 1.7 Min-Max = 3-11	416	69.3
Poor knowledge *(Mean score < 9.8)*		184	30.7
Total		**600**	**100.0**

Also shown in detail in **Figure 2** is the proportion of FSWs exposed and did not expose to source of HIV information. Mass media, particularly TV, group discussion, and health staff played an important role in disseminating HIV knowledge among FSWs. TV (83%) had become the most frequent cited source of HIV information for FSWs, followed by other sources such as: group discussion (77%), leaflets (54%), and health staff (40%).

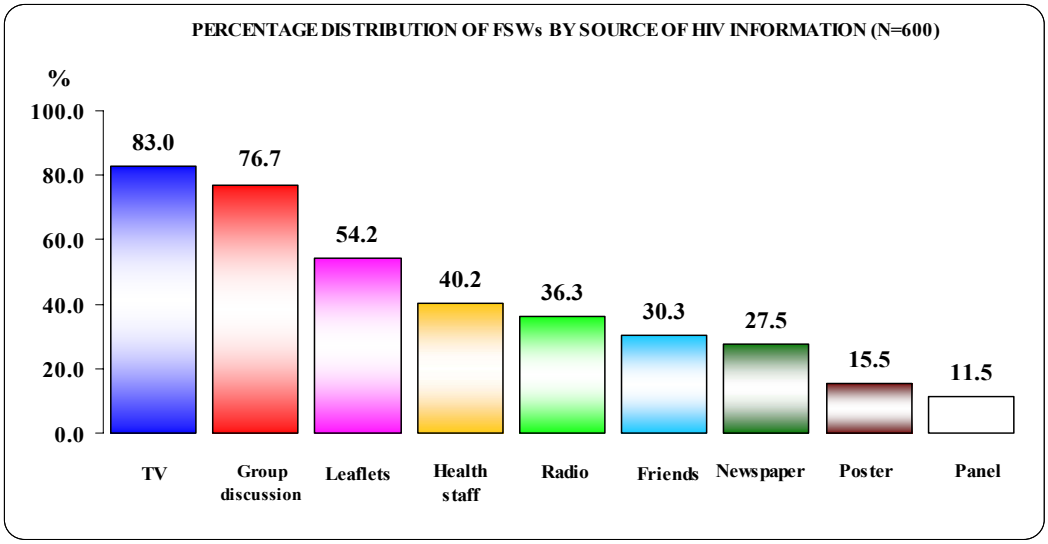

Figure 2: Source of HIV information (N=600)

Most of the FSWs knew that HIV could be transmitted by sharing infected needles (99.0%), having sex without condoms (97.7%) or from mother to child during pregnancy (96.8%). Nevertheless, still 23.2% of them mistakenly believed that mosquito bites could transmit HIV. A very high proportion of FSWs were aware that HIV infection can be prevented by using condom use when have sex (98.3%), or not sharing infected needles (96.8), even though nearly 22% erroneously believed that using mosquito nets could prevent this infection (see **Table 3).**

Table 3: Percentage distribution of FSWs by HIV transmission ways and prevention methods

(N = 600)

HIV knowledge	Agree		Disagree		Don't know	
	N	%	N	%	N	%
Transmission ways						
Sharing needles	594	99.0	6	0.1	0	0.0
Mosquitoes	139	23.2	449	74.8	12	2.0
Have sex without condoms	586	97.7	13	2.2	1	0.2
Mother to child	581	96.8	17	2.9	2	0.3
Sharing utensils	33	5.5	565	94.2	2	0.3
Normal contacts	33	5.5	559	93.2	8	1.3
Prevention methods						
Not sharing needles	581	96.8	3	0.5	16	2.7
Always using condoms when having sex	590	98.3	7	1.2	3	0.5
Using mosquito net	131	21.8	459	76.5	10	1.7
HIV infected women should not get pregnant or deliver a child	550	91.7	48	5.3	2	0.3
Not living with PWHA	119	19.8	468	78.0	13	2.2

Sexual relationship of the respondents

The median age of sexual debut of FSWs was 20 years and nearly one-fifth reported having initiated sex when they were under 17; nearly half (48%) had their first sexual experience at ages 20-25 years. The median number of regular and non-regular partners of FSWs during last 6 months was 3 and 70, respectively (see **Table 4)**.

Table 4: Percentage distribution of FSWs by sexual relationship

Sexual relationship	Frequency	Percentage
Age at first sexual intercourse (years)		
14-17	115	19.2
18-19	156	26.0
20-25	287	47.8
26 -35	42	7.0

Table 4: Percentage distribution of FSWs by sexual relationship *(Continued)*

Sexual relationship	Frequency	Percentage
Frequency of sexual intercourses with regular partners last month (times)		
1-4	201	33.5
≥ 5	399	66.5
Frequency of sexual intercourses with non-regular partners last month (times)		
1-8	141	23.5
≥ 9	459	76.5
Number of regular sexual partners during the last 6 months		
0 - 1	191	31.8
≥ 2	409	68.2
Number of non-regular sexual partners during the last 6 months		
1-10	81	13.5
≥ 11	519	86.5
Total	**600**	**100.0**

Level of condom use

Level of condom use depends on type of sexual partners in the last sexual intercourse and in the last 6 months (see **Table 5**). Data showed that condom use among FSWs varied differently from non- regular partners to regular partners during the last sexual intercourse and the 6 months previous to the survey. Accordingly, level of condom use of the FSWs was higher among non-regular partners compared to regular partners. In detail, FSWs claimed to use condoms less consistently with regular partners in comparison with non-regular partners in the last sexual intercourse (75.7% vs. 96.7%) and in the last 6 months (43% vs. 80.8%: nearly two times less consistently!). It also showed that unsafe sex practice was still common among FSWs, particularly for regular sexual partners (No condom use at last sex was 24.3 % and inconsistent condom use in the last 6 months was 57.0%). This finding supports previous research that found "higher intimacy among sex workers and regular paying partners was negatively associated with consistent condom use." (Kerrigan et al., 2003).

Table 5: Percentage distribution of condom use by type of sexual partners

Condom use with	Frequency	Percentage
Non-regular sexual partners last sexual intercourse		
Yes	580	96.7
No	20	3.3
Regular sexual partners last sexual intercourse		
Yes	454	75.7
No	146	24.3

Table 5: Percentage distribution of condom use by type of sexual partners *(Continued)*

Condom use with	Frequency	Percentage
Non-regular sexual partners during last six months		
Consistent	485	80.8
Inconsistent	115	19.2
Regular sexual partners during last six months		
Consistent	258	43.0
Inconsistent	342	57.0
Total	**600**	**100.0**

Negotiation skill, perception of condoms accessibility and reliability

Table 6 showed a small proportion of the interviewees (8%) complained condoms are not easy to buy and receive when necessary. About 17% conceded not to be able to convince their sexual partners to use condom when having sex. High proportion of respondents (43.5%) perceived that "condoms are not reliable and effective in preventing HIV and other STIs transmission because of their facile breakage and slippage".

Table 6: Percentage distribution of FSWs by reinforcing factors

Reinforcing factors	Frequency	Percentage
Negotiation skill		
Yes	495	82.5
No	105	17.5
Perceived accessibility to condoms		
Yes	552	92.0
No	48	8.0
Perceived reliability of condoms		
Yes	339	56.5
No	261	43.5
Total	**600**	**100.0**

Determinants of consistent condom use among FSWs

To identify key determinants of consistent condom use among FSWs in the past 6 months types of sexual partners, binary logistic regression, in which consistency of condom use with regular and non-regular partners was treated as outcome variables and predisposing factors, enabling risk factors, and reinforcing factors as predictor variables. **Two models** were employed to predict consistent condom use with regular and non-regular partners among FSWs. In **Model 1**, **consistent condom use among FSWs with regular partners** was predicted by predisposing factors (age, marital status, working experience, education, and age at first sex), enabling risk factors (HIV knowledge and number of regular partners in the last 6 months), and reinforcing factors (negotiation skill,

perceived accessibility to condoms, and perceived reliability of condoms). In **Model 2**, **consistent condom use among FSWs with non-regular partners** was also predicted by explanatory variables i.e. predisposing factors, enabling risk factors, and reinforcing factors, which were similar to Model 1. Results of binary logistic regression are in details predicted in **Table 7** below.

Table 7: Binary logistic regression results for determinants of consistent condom use

Predictors	Model 1 (condom use with regular partners)		Model 2 (condom use with non-regular partners)	
	B	**Exp (B)**	**B**	**Exp (B)**
Age (≥ *40 years* ®)				
≤19 years	-0.96	0.38	-1.05	0.35
20-29 years	-0.84	0.43*	-0.62	0.54
30-39 years	-0.38	0.68	-0.40	0.67
Marital status (*Single* ®)				
Married	-0.87	0.42**	-0.10	0.90
Divorced/ separated/widowed	0.11	1.12	0.04	1.04
Duration of work (≥ *6 years* ®)				
≤ 1 year	0.62	1.85	1.48	4.41***
2-5 years	0.50	1.66	0.59	1.80
Education level (*Secondary school or higher* ®)				
Primary school or lower	-0.01	0.99	-0.04	0.96
Age at first sexual intercourse (≥ *26 years* ®)				
14-17 years	-0.15	0.86	0.30	1.34
18-19 years	-0.20	0.82	0.30	1.34
20-25 years	-0.19	0.83	0.55	1.74
HIV/AIDS knowledge (*Poor knowledge* ®)				
Good knowledge	0.66	1.93**	0.85	2.34***
N. of regular partners (*0-1* ®)				
≥ 2	1.13	3.09***		
No. of non-regular partners (≤ *10* ®)				
≥ 11			0.75	2.11*
Negotiation skill (*Unpersuadable* ®)				
Persuadable	0.67	1.95*	0.82	2.27**
Perceived accessibility to condoms (*Inaccessible* ®)				
Accessible	0.42	1.53	-0.36	0.70
Perceived reliability of condoms *(Unreliable®)*				
Reliable	0.42	1.52*	0.45	1.56

Table 7: Binary logistic regression results for determinants of consistent condom use *(Continued)*

Predictors	Model 1 (condom use with regular partners)		Model 2 (condom use with non-regular partners)	
	B	**Exp (B)**	**B**	**Exp (B)**
Constants	**-2.78**	**.06*** **	**-1.30**	**0.27**
R Square	**0.14**		**0.09**	
N	**600**		**600**	

*Significant level: * $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$; ® = Reference category*

Model 1: Predictors of consistent condom use among FSWs with regular partners

Predisposing factors

It is found that FSWs aged 20-29 years was significantly associated with consistent condom use with regular partners, while other age groups (under 19, and 30-39) were not: FSWs aged 20-29 years were 57% less likely to use condoms consistently with regular partners than those who were 40 years or more ($p \leq 0.05$), when other variables are held constant. Regarding marital status of respondents, the results showed that divorced/separated/widowed FSWs were more likely to use condoms consistently with regular partners than were single ones, but the relationship is statistically insignificant. Only married FSWs was found its significantly negative effect on intention to use condoms consistently: married FSWs were 58% less likely to be consistent condom users with regular partners compared to those who were still single ($p \leq 0.01$), controlling for other variables. **Table 7** also indicates that other covariates (duration of work, education level) did not have significant association with consistent condom use. These findings are similar with previous studies: education factor was not associated with consistency of condom use (Ford et al., 2000; Tam, 2004), and have the same argument with Sopheab et al. (2008) that FSWs' duration of work was not associated with consistent condom use.

Enabling risk factors

A significant association between HIV/AIDS knowledge and consistent condom use was found in Model 1: HIV knowledge had a positive effect on consistence of using condoms among the respondents and their regular partners. FSWs who had good HIV/AIDS knowledge were 1.9 times more likely to be consistent condom users than those who had poor knowledge ($p \leq 0.01$), when other factors are held constant. Number of sexual partners was significantly associated with consistent condom use with regular partners during the last 6 months in the model: FSWs who had 2 or more regular partners were 3 times more likely to use condom consistently than those who had only 1 regular partner ($p \leq 0.001$).

Reinforcing factors

Negotiation skill and perceived reliability of condoms had a positive effect on consistent condom use in the model (OR=1.95 and OR= 1.52, respectively). It could be predicted that FSWs who had good sexual negotiation skill were 2 times more likely to convince successfully their regular partners to use condoms consistently than those who did not and FSWs who perceived condoms were reliable and effective in preventing HIV/STIs transmission were 1.5 times more likely to be consistent condom users than those who did not ($p \leq 0.05$). Nevertheless, among reinforcing factors, perceived accessibility to condoms was found no statistically significant association with consistent condom use. It might be explained that accessibility to condoms is no longer a problem in Khanh Hoa since condoms are easy to buy and receive in many places in the province or an intimate relation with this type of partners probably led the respondents not to intent to use condoms consistently.

Model 2: Predictors of consistent condom use among FSWs with non-regular partners

Predisposing factors

It is indicated in **Model 2** that duration of work of FSWs was highly associated with condom use: those who worked less than 6 years (less than 1 year and 2-5 years) had higher odd compared to those who worked longer than 6 years, particularly those who worked less than 1 year were more likely to use condom consistently with non-regular partners about 4.4 times compared to those who had been working 6 years or more (significant at high level of confidence: $p \leq 0.001$). This finding is opposite with a 2000 study in Vietnam, which found that FSWs who had been working less than one year were less likely to use condoms consistently with sexual partners than were FSWs who had been working longer (Nguyen et al., 2000).

Enabling risk factors

Model 2 again in this study proves that HIV knowledge was a strong predictor of condom use at the highest level in the model ($p \leq 0.001$): HIV knowledge was significantly associated with consistent condom use among the respondents and their non-regular partners. FSWs who had good HIV/AIDS knowledge were 2.3 times more likely to use condoms frequently with non-regular partners than those who did not. In addition, number of non-regular partners in the last 6 months showed its positive influence on consistent condom use: FSWs who had 11 or more non-regular partners were 2 times more likely to be consistent condom users than those who had 10 or less non-regular partners ($p \leq 0.05$).

Reinforcing factors

By comparison with **Model 1**, FSWs's negotiation skill that plays a very important role in convincing condom use also shows its positive effect in **Model 2**. FSWs who claimed they could negotiate successfully their non-regular partners to use condoms were 2.3 times more likely to be consistent condom users than those who did not ($p \leq 0.01$). However, perceived accessibility to condoms and perceived reliability of condoms were not statistically significant associated with consistent condom use with non-regular partners. In

other words, both "predictor variables" could not "predict" FSWs' safe sexual practice with their non-regular partners, implying that an increased perception of accessibility to and reliability of condoms was not associated with an increased sexual practice such as consistent condom use, particularly with non-regular partners.

Conclusion

Although various studies have shown that safe sex is not a common practice among FSWs, the factors that determine their consistent condom use with regular or non-regular sexual partners are little known. The main aim of the study is to gain more insight into the determinants of consistent condom use among FSWs with regular and non-regular sexual partners in Khanh Hoa, Vietnam.

Results from logistic regression analysis illustrates the effects of various factors such as predisposing factors, enabling risk factors, and reinforcing factors, which are hypothesized in the theoretical models and found in many previous studies, on consistent condom use. The results from both models of the analysis point out that among such various predictor variables, HIV/AIDS knowledge, number of sexual partners, and negotiation skill are supported by the study findings since they are all statistically significant predictors of consistent condom use among FSWs with different types of sexual partner. HIV knowledge was found to be significantly associated with consistent condom use with both regular and non-regular partners. FSWs who had good HIV/AIDS knowledge were more likely to use condoms consistently with regular and non-regular partners (1.9 times and 2.3 times, respectively) than those who had poor knowledge. The finding in this study is similar with the findings in some previous studies, which found a positive relationship between HIV/AIDS knowledge and condom use: FSWs who had more HIV/AIDS knowledge were more likely to use condoms (Habib et al., 2001; Dominique et al., 2001), in contrast to other studies since they all found no relationship or no significant association between HIV/AIDS knowledge and condom use (Soonthorndhada, 1999; Wong et al., 2003; Tam, 2004). More depressingly, the opposite results were found in Toor's study: a negative association between HIV/AIDS knowledge and condom use (2003). However, it was found in this study that there was a significantly positive association between HIV/AIDs knowledge and consistent condom use. Along with HIV/AIDS knowledge, **Negotiation skill** was also found significantly associated with consistent condom use with both regular and non-regular partners. FWSs who had good sexual negotiation skill were 2 times more likely to convince successfully their regular partners using condoms consistently than those who did not. FSWs who claimed they could negotiate successfully their non-regular partners using condoms were 2.3 times more likely to be consistent condom users than those who did not. The result of this analysis was supported by a 2003 study in Cambodia, which found that negotiation skill was a very important factor significantly affected condom use among FSWs. Moreover, they argued that the influence of negotiation skill is even stronger than HIV/AIDS knowledge (Wong et al., 2003)! The **number of sexual partners** was also found to be significantly associated with consistent condom use with types of sexual partners during the last 6 months. FSWs who had 2 or

more regular partners were 3 times more likely to use condom consistently than those who had only 1 regular partner. And FSWs who had 11 or more non-regular partners were 2 times more likely to be consistent condom users than those who had 10 or less non-regular partners. This finding is similar with the findings in some previous studies, which concluded FSWs who had more sexual partners were more likely to use condoms frequently than those had fewer (Nguyen, 2000; Tam, 2004). Furthermore, both negotiation skill and number of sexual partners are theoretically supported by the AIDS Risk Reduction Model (ARRM) that pointed out many different possible factors might help to change the individual's attitude and risk behavior. **Duration of work** was highly associated with condom use: those who worked less than 6 years (less than 1 year and 2-5 years) had higher odd compared to those who worked longer than 6 years, particularly those who worked less than 1 year were more likely to use condom consistently with non-regular partners about 4.4 times compared to those who had been working 6 years or more. **Perceived reliability of condoms** was found having positive effect on consistent condom use in this study: FSWs who perceived condoms were reliable and effective in preventing HIV/STIs transmission were 1.5 times more likely to be consistent condom users than those who did not.

Recommendations for HIV/AIDS intervention

The findings in this study lead to the recommendation that HIV/AIDS knowledge has a significantly positive effect on FSWs' condom use behavior. The influence of HIV/AIDS knowledge should continue to be emphasized when designing interventions programs for FSWs and their partners as well. The study findings identify an important challenge to HIV/STIs intervention programs attempting to change HIV-related sexual behavior among FSWs. Enabling risk factors and reinforcing factors influencing FSWs' condom use with both regular and non-regular sexual partners should be taken into account in order to promote the consistent use of condoms. Emphatically, intervention programs should focus on enhancing FSWs' sexual negotiation skill as well as overcoming the negative perception of FSWs towards reliability of condoms in order to make condom use the norm.

Recommendations for future studies

The results of the study reveal that although there was rather good knowledge about HIV/AIDS high risk sexual behaviors were still common among FSWs. Therefore, further studies should focus on gaining more insight into other factors, such as alcohol consumption, drug use or psychological factors, i.e. self-esteem, self-efficacy, perceived susceptibility to HIV infection are important predictors that are most likely to affect condom use behavior of FSWs that might be involved in influencing safe sex practice among FSWs. It would be necessary for improving understanding of condom use behavior among FSWs and their partners as well. More importantly, it would be helpful for designing more effective and practical HIV/STIs interventions aiming at increasing consistency of using condoms among FSWs and the clients. From the study key findings,

this also suggests that the combination of qualitative and quantitative methods in order to further explore reasons they engage in unsafe sex practice with their sexual partners, particularly with regular partners deserves further research.

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The Influence of Internet Exposure on Adolescents' Sexual Attitudes: A Study among Secondary School Students in Semarang, Central Java, Indonesia

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Background and Rationale

Semarang as Central Java's capital is considered representative of Javanese Culture. Javanese ethnic in the past were well known for holding Moslem traditional values strictly. However, studies reveale that youth in Central Java nowadays enjoy a much more liberal environment (Ford, Shaluhiyah, and Suryoputro, 2007: 59-76). Youth sexual attitudes and behavior are becoming more permissive (Ford, Shaluhiyah, and Suryoputro, 2007: 59-76; Shaluhiyah, 2006; Winarno, 2008); 18% of males and 6% of females of Central Java's youth had engaged in premarital sexual intercourse (Ford, Shaluhiyah, and Suryoputro, 2007: 59-76; Winarno, 2008). This is a concern since adolescents are in an exploratory phase of life; they do not plan their sexual experiences and often are not well prepared or informed about sexual practices.

Most people would agree that parents and children should be able to talk about sex, sexuality, and relationships in a convenient atmosphere. However, in practice, parents are often reluctant to talk to their children about sex (Strasburger, 2006: 1427-1431). That's why, in the absence of other suitable sources for seeking information, media helps to fill information gaps for young people, providing information about topics that parents and schools are not discussing (Strasburger, 2006: 1427-1431).

The amount of time adolescents spend using computers and going online is likely to increase as computer penetrate homes and schools. In United States, internet use is particularly high for adolescents with 75.6% of 14-to 17-year-olds and 65.4% of 10-to13-year-olds accessing the internet (Gray et al., 2005: 1467-1478). In Europe, British adolescent's internet use was approximately 36%, with five hours per day as an average time used (Thornburgh and Lin, 2002: 480).

Compared to developed countries like USA and British, South East Asian economies are in the developing phase when it comes to internet use, with user penetrations typically at the lower end of the scale (Family Safe Media, 2006).

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Despite highly penetrated internet markets to be found in Singapore, Brunei and Malaysia, of Asia's estimated 450 million internet users in early 2007, only about 65 million were to be found in South East Asia. In other words, South East Asia had around 14% of the internet user population of the region at the time.

As well as other South East Asia countries, the numbers of internet subscribers in Indonesia are limited. In Indonesia, there were about 20 million people (9%) accessing internet (Research&Market, 2007), whilst in Central Java specifically Semarang, internet is more widely used nowadays especially when it penetrates schools. Out of 97 high schools in Semarang, approximately 25 % of them are already connected to the internet.

The existence of internet has become controversial because it's a source of promise and source of concern (Thornburgh and Lin, 2002: 480). Despite its risk providing sexually explicit online material, many people argued that internet provide information about health and life (Brown and Keller, 2000: 255-256; Greenfield, 2004: 741-750; Lenhart, 2005). By its accessibility, availability and affordability, internet widely reaches communities across the countries providing information people need. Internet make people's life become more efficient, more productive, enabling them to avoid unnecessary transportation making them less stressed, for them to have more time and new online contacts (Barak and Fisher, 2001: 324-332, 2003: 293-308; Brown and Keller, 2000: 255-256; Feldman, 1989; Gray et al., 2005: 1467-1478; Greenfield, 2004: 741-750; Levy and Strombeck, 2002: 495-510; Lou, Zhao, and Gao., 2003; Osgerby, 2004; Thornburgh and Lin, 2002: 480).

However, the extent of sexually explicit online material has become a major concern of adolescents' internet use. Many studies have indicated that the exposure of sexually explicit materials is associated with adolescent's recreational attitude towards sex and behaviors (Brown and Keller, 2000: 255-256; Fleming et al., 2006: 135-154; Gray et al., 2005: 1467-1478; Levy and Windahl, 1984: 51-78; Lo and Wei, 2005; Lou, Zhao, and Gao., 2003; O-Prasertsawat and Petchum, 2004: 755-9; Peter and Valkenburg, 2006: 178-204; Phoemshap, 2003: ix, 87 leaves ; 30 cm; Thornburgh and Lin, 2002: 480). Therefore, the internet has been perceived as being a serious risk to adolescents, given they are highly curios about sexual matters on the one hand, and on the other hand, lacking experiences and abilities to put the information gained from the internet into the right perspective (Ross, Dick, and Ferguson, 2006).

Objectives

As the internet is both a source of promise and concern for adolescents, and considering that information of sexual and reproductive health among Indonesian adolescents is lacking, this study examines the influence of internet exposure, and other factors contributing to adolescents' sexual attitudes.

Methods

In August-September 2008, a cross sectional study was conducted, involving 320 students who were randomly selected from two strata, public and private schools in Semarang. A self administered questionnaire based on semi-school setting was employed to measure adolescents' media use (including internet and other media) and adolescents' sexual attitudes.

Prior to the implementation of the survey, institutional approval, and adolescents' oral consent were obtained. Respondents were given a brief introduction about the research purposes, assured that their answers would remain anonymous and finally, they were asked to make sure that they filled in the questionnaire in privacy. They brought the anonymous questionnaire home in a sealed envelope and returned it the next day.

Result and Discussion

As many studies reveal, adolescents are heavy users of various media (Coleman, Catan, and Dennison, 2005: 227-234; Osgerby, 2004; Strasburger, 2006: 1427-1431; Thornburgh and Lin, 2002: 480). They are engaged with several kinds of media at the same times. Since all of the selected schools provide internet connection for their students, all of the respondents in this study were exposed to the internet.

Out of 335 respondents, 329 of them returned the questionnaires. However, nine respondents were excluded from the analysis since they did not complete the form, thus the response rate was 95.5% and therefore the total sample was 320 students.

Characteristic of Study Population

From the 320 study subjects, more than half (55.8%) were female and most of them (89%) were Javanese. Nevertheless, 7.8% of them were Chinese and the rest were a mixture of other ethnics groups. Although the vast majority of respondent (81.6%) were Moslem, 18% of respondents were Christian and less than 1% were Buddhist.

Table 1: Characteristic of Study Population

Variables	n	Percentage (%)
Sex		
Male	136	41.2
Female	184	55.8
Total	320	100
Ethnicity		
Javanese	285	89.1
Sunda	1	0.3
Batak	4	1.2
Padang	1	0.3
Betawi	1	0.3
Bugis & other Sulawesi	2	0.6
Dayak & other Kalimantan	1	0.3
Chinese	25	7.8
Total	320	100
Religion		
Moslem	261	81.6
Buddhist	1	0.3
Christian	58	18.1
Total	320	100

Sexual Attitudes

It seems that adolescents' sexual attitudes nowadays have shifted from less permissive to more permissive. This study found that 45.9% of adolescents were categorized as more permissive based on their respond to 22 questions of attitudes statements including attitudes toward premarital sex, condom use, cohabitation, prostitution and masturbation. They may respond to the statements with five attitudinal scale ranged from strongly agree to strongly disagree. The total scores then categorized into more or less permissive based on central tendency value.

Table 2: Respondents' Level of Permissiveness

Variables	n	Percentage (%)
Sexual Attitudes		
Less Permissive	173	54.1
More Permissive	147	45.9
Total	320	100

This study found that although two thirds of them negatively responded to premarital sexual intercourse, about one fourth agreed or were undecided towards the statement. This study also found that there was an inconsistency of attitudes towards condoms. Although about a half of respondents agreed using contraception as the act

of responsible person, but more than half agreed that using condom with a regular boy/girlfriend were unnecessary. Given this, it should be a concern since their low awareness and ignorance simply put them in a risk of unwanted pregnancy and sexually transmitted infections.

As a common value in Javanese culture, respondents' attitudes towards prostitutes, cohabitation, homosexuality and pornography also showed a normative result. More than half judged that prostitutes as well as cohabitation were unacceptable. Their attitudes towards homosexuality and erotic movies were negative. However, nearly half of the respondents were unsure about masturbation.

This study indicated that adolescents' sexual attitudes were formed by many factors. Logistic regression showed that internet content was found to be the strongest predictor (Table 3) with exposure to the internet being a protective factor for adolescents. Other media exposure, sex, ethnicity, living arrangement and peer influence also were predictors for adolescents' sexual attitudes.

Table 3: *Determinant Analysis of Adolescents' Sexual Attitudes*

Variables	Sig.	Odds Ratio
Internet Exposure	**.000**	**.287**
Internet Content	.000	
Entertainment sites	**.000**	**1.814**
Potentially harmful or porn sites	.213	.722
Unable to mention any sites	**.000**	**3.930**
Internet Motive	.091	
Communication	.029	1.663
Entertainment	.047	1.575
TV Exposure	**.000**	**.693**
Comic Exposure	.039	
Low exposure	**.012**	**1.286**
High exposure	.504	1.075
Peer Influence	**.000**	**.550**
Living Arrangement	**.000**	**1.484**
Ethnicity	**.000**	**.243**
Sex	**.000**	**3.360**
Constant	.000	.359

Internet Exposure

The time adolescents spend on the internet is likely to increase as this technology becomes more available. Several years ago, when the cost of internet access was relatively high, adolescent went to internet cafés and paid around 7.500 IDR (0.75 USD) for an hour. But now, the rate is only IDR 10.000 (1 USD) for 3 hours internet access at an internet café, or IDR 100.000-200.000 (10-20 USD) a

month to have daily internet connection at home or on an internet mobile. Moreover, as the government of Indonesia starts to establish internet connection at schools, the cost of internet access has rapidly decreased (subsidized), as it is now given free to students. As a result, most students in urban area use or have used the internet.

On average, the study respondents used the internet for about 9 hours a week. They have regular internet connection at school for about 2-4 hours in a week, and the rest of the time would have been at home, friends' houses and at internet cafés. They accessed the internet mostly with their friends, and were rarely accompanied by their parents or other family members.

Table 4: Internet and Sexual Attitudes by Sex

Variable	Male (%)		Female (%)	
	Less Permissive	More Permissive	Less Permissive	More Permissive
Exposure*)				
Low	61.9	38.1	32.7	67.3
High	78.1	21.9	53.8	46.2
Total	70.6	29.4	41.8	58.2
Content*)				
(Group 1)	85.4	14.6	47.4	52.6
(Group 2)	63.2	36.8	33.3	66.7
(Group 3)	81.8	18.2	50.0	50.0
(Group 4)	50.0	50.0	66.7	33.3
Total	70.6	29.4	41.8	58.2
Motive of Access				
Education	72.6	27.4	41.9	58.1
Communication	69.8	30.2	40.6	59.4
Entertainment	55.6	44.4	46.7	53.3
Total	70.6	29.4	41.8	58.2

*Note : *) variables significant at bivariate analysis with p value <0.05*
Group (1): Accessed mailing, networking, communication websites
Group (2): Accessed entertainment websites
Group (3): At least mention one potentially harmful or porn sites
Group (4): Unable to mention any websites

Females who had a low exposure to the internet were more likely to have more permissiveness attitudes about sex, while both females and males who had a high exposure to the internet had less permissive attitudes about sex. (Table 4). This finding also supported by the result of the logistic regression which showed adolescent who were more exposed to the internet were 0.28 times less likely to have more permissive sexual attitudes. This study indicates that the internet was a good medium to deliver health messaged especially to young people since they are getting more involved with this media. The internet helped students find information related to school assignment as well as other information they are interested in. The

availability of the internet in their school gives them opportunity to access more advance information and in a more convenient way than going to the library. The lower price of internet subscriber also gives them a chance to interact with this media more frequently (Barak and Fisher, 2001: 324-332, 2003: 293-308; Brown and Keller, 2000: 255-256; Feldman, 1989; Gray et al., 2005: 1467-1478; Lou, Zhao, and Gao., 2003; Thornburgh and Lin, 2002: 480).

Cultivation Theory claims heavy exposure to mass media creates and cultivates attitudes more consistent with a media-directed version of reality than with reality it self. Media portrayals and messages affect the behavior of young persons over time by enabling them to acquire new attitudes and behaviors or by changing the likelihood that they will perform new or previously learned responses (Chandler, 2006; Escobar-Chaves et al., 2005: 303-326; Shanahan and Morgan, 1999; Ward and Rivadeneyra, 1999).

Referring to this theory, the internet may lead adolescents to have good sexual attitudes. Barak and Crutzen revealed that the internet played an important role in raising awareness of adolescents on sexual reproductive health matters. Adolescents who were more exposed to the internet had significantly have higher knowledge and better attitudes toward sexual matters (Barak and Fisher, 2001: 324-332, 2003: 293-308; Barak and King, 2000: 517-520; Crutzen, 2009; Goodson, McCormick, and Evans, 2001: 101-118; Lou, Zhao, and Gao., 2003).

Internet Content

Most respondents accessed entertainment websites (49.1%) and education-mailing-communication websites (42.5%). Only 4.1% openly admitted they accessed potentially harmful or porn sites while 4.4% were unable to mention any websites. Although, google, friendster, yahoo and one manga were the most accessed websites, the respondents' keywords - *Lalat x, Japanese girl, sex, bokep, bisex, pic,* and *gambar xxx* - indicated that they were being exposed to potentially harmful porn sites.

Table 4 showed that respondents who have more permissive sexual attitudes were mostly those who accessed entertainment websites (group 2). However, the likelihood of having more permissive sexual attitudes was 3.930 and 1.814 times higher among adolescents who were unable to mention any websites and among those who accessed entertainment websites.

It is believed that adolescents unable to mention any websites actually had the same risk with those exposed with potentially harmful or porn sites. They maybe unable to mention any websites because they were reluctant to openly mention the name of the sites they have visited. They tend to respond normatively because Javanese norms hold the value that sexual matters are considered taboo for unmarried young people.

Another possibility is they could not remember the name of websites they have visited. It is not necessary to search porn sites since there are many advertisements and links that directly guide internet users to visit those sites just with one click.

Motive of Access

According to uses and gratification theory, internet users' motives are divided into affection, control and inclusion. In 1988, six primary motives for interpersonal communication were suggested: pleasure, affection, inclusion, escapism, relaxation and control. In 1998, Flaherty, Pearce and Rubin reported that individuals used computers to satisfy three major needs: interpersonal needs (inclusion, affection, relaxation and control); traditional needs associated with media (social interaction, passing time, information, habit, entertainment); and new media needs such as time shifting, meeting other individuals (Angelman, 2000; Johnson and Kaye, 2003: 304-325).

This study found that many respondents had an education motive (59.1%) to access the internet. They accessed the internet to learn new things and because it was easy to find information they needed from. One third of the respondents indicated that communication was their main motive for using the internet. They accessed the internet to keep in touch with people and to find friends. However, most (87.5%) respondents had an entertainment motive to access the internet. although less than 5% of respondents accessed the internet for purposes such as role plays or stimulation.

These findings contradict other studies' findings. Many studies indicate adolescents' motives for accessing the internet is for sexual pleasure. Those who access internet for entertainment purposes were expected to have more permissive sexual attitudes. One possible explanation for why the respondents' motives to use the internet failed as a predictor of adolescents' sexual attitudes was the difficulties in distinguishing internet user's single motive. Respondents seem to have more than one motive when accessing the internet at one point of time.

Other Media Exposure

Except from the internet, other media exposure was also influencing adolescents' sexual attitudes. On average, respondents were exposed by various media (printed, visual and internet) for 54 hours a week, consisting of eight hours printed media exposure, 38 hours visual media exposure and nine hours internet exposure. Table 5 showed that generally, males who were highly exposed to the media were less permissive; though for females they were more permissive.

Using a bivarate analysis, television and visual media were only significant for female adolescents' sexual attitudes whilst printed media had no association for both genders. However, a logistic regression showed that adolescents who had low exposure of comic book were 1.286 times more likely to have more permissive sexual attitudes and adolescents who have higher level of television exposure were 0.69 times less likely to have more permissive sexual attitudes. This study indicates that as apart from the internet, television provides information about sexual reproductive health matters that adolescents need. Since the internet and television are the most popular media for adolescents, its role in providing information on sexual reproductive health are undeniable.

Table 5: Exposure of Various Media

Variable		Male (%)		Female (%)	
		Less Permissive	More Permissive	Less Permissive	More Permissive
Printed Media exposure					
Low		67.2	32.8	41.3	58.7
High		73.1	26.9	42.7	57.3
	Total	70.6	26.9	41.8	58.2
Magazines					
Never		56.0	44.0	48.4	51.6
Low		70.4	29.6	40.6	59.4
High		80.0	20.0	40.4	59.6
	Total	70.6	26.9	41.8	58.2
Newspaper					
Never		68.0	32.0	44.4	55.6
Low		75.0	25.0	40.7	59.3
High		67.8	32.2	42.5	57.5
	Total	70.6	26.9	41.8	58.2
Comic					
Never		72.7	27.3	44.0	56.0
Low		61.7	38.3	38.6	61.4
High		77.8	22.2	41.9	58.1
	Total	70.6	26.9	41.8	58.2
Visual Media Exposure*)					
Low		70.5	29.5	32.3	67.7
High		70.7	29.3	63.2	36.8
	Total	70.6	26.9	41.8	58.2
Television*)					
Low		71.2	28.8	32.4	67.6
High		69.8	30.2	55.3	44.7
	Total	70.6	26.9	41.8	58.2
Video					
Never		69.5	30.5	39.8	60.2
Low		72.2	27.8	45.9	54.1
	Total	70.6	26.9	41.8	58.2

*Note: *) variable significant with p-value <0.05 (on female)*

Individual and Social Factors

From several individual and social factors analyzed in this study, sex and living arrangements were good predictors of adolescents' sexual attitudes whilst ethnic and peer influence were found to be protective factors. Table 6 showed that more females were more permissive then male respondents.

Table 6: Individual and Social Factors

Variable		Less Permissive		More Permissive	
		n	%	n	%
Sex*)					
Male		96	70.6	40	29.4
Female		77	41.8	107	58.2
	Total	173	54.1	147	45.9
Daily Pocket Money					
Low, <5000 IDR		47	50.5	46	49.5
Medium, 5000-10.000 IDR		107	55.7	85	44.3
High, >10.000 IDR		19	54.3	16	45.7
	Total	173	54.1	147	45.9
Living Arrangement*)					
Free living arrangement		102	50.0	102	50.0
Ruled living arrangement		71	61.2	45	38.8
	Total	173	54.1	147	45.9
Knowledge					
Low knowledge		104	53.9	89	46.1
High knowledge		69	54.3	58	45.7
	Total	173	54.1	147	45.9
Family Relation					
Loose relation		101	56.7	77	43.3
Tight relation		72	50.7	70	49.3
	Total	173	54.1	147	45.9
Peer Influence*)					
Low influence		101	46.1	118	53.9
High influence		72	71.3	29	28.7
	Total	173	54.1	147	45.9

*) *variables significant at p-value <0.05*

The difference between female and male respondents might be caused by the influence of visual media exposure to female sexual attitudes. Chi-square test on bivariate level showed that television exposure was only significant for females. This is possible because female adolescents were more likely to spend more time watching television at home than did males. The genres of television programs had been watched also might have more influence to female sexual attitudes. Whilst most males prefer news and sport, most females indicated news, infotainment and soap operas were their most watched programs.

Although living arrangement and peer influence was statistically significant at bivariate level, this study found that only living arrangement predicts adolescents' sexual attitudes along with other variables. Adolescents who have free living arrangement were 1.4 times more likely to have more permissive sexual attitudes.

Conclusion

This study indicates that the internet was not the only factors forming adolescents' sexual attitudes. It was not exposure to a medium, but the users' attitudes toward it which lead them to have more permissive sexual attitudes. Therefore, there is no reason to limit adolescents' internet use. However, it is neccesary to eqquip them with a proper self risk management skill, including the skill in preventing and handling unintentionally access of sexually explicit online materials.

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Environmental Factors Affecting Risk Behaviors among IDUs in Vinhlong Province, Vietnam

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Abstract

This study examines the effects of environmental factors on risk behaviors among IDUs when controlled for personal factors. Secondary data from a cross-sectional study for knowledge, attitudes, beliefs, and practices on HIV/AIDS were used for analysis. The total sample size was 360 IDUs in Vinhlong province. The results of binary logistic regression indicate that environmental factors affect risk behaviors. Attending IDU clubs was less likely to be associated with inconsistent condom use, and receiving peer educator assistance and living with family were less likely to be associated with needle sharing. Personal factors, namely, age group, education level, HIV knowledge, perceived HIV status, number of sexual partners, and duration of injection were associated with risk behaviors. Results suggest that the HIV/AIDS harm reduction intervention programs need to strengthen the roles of peer educators and IDU clubs as well as encourage families to accept and support their IDUs members.

Keywords : HIV/AIDS, risk behavior, inconsistent condom use, needle sharing, environmental factor, IDUs, Vinhlong, Vietnam

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Introduction

Drug injection is a strong driver of HIV infection in Vietnam. According to the Vietnam Administration of HIV/AIDS Control (VAAC), injecting drug users (IDUs) made up more than half of the 132,000 people living with HIV (PLHIV) in the country as of August 31, 2008 (VAAC, 2008; VAAC, 2009). More than 1,500 new cases are reported every month. Thus, the HIV epidemic is still increasing even though it is still concentrated among high risk populations, including IDUs, in Vietnam (VAAC, 2008).

Needle sharing leads to an increase in the HIV transmission rate of 10%-50% person-year at risk (Jarlais and Semaan, 2008). However, the risk is not only due to needle sharing but comes also from unprotected sex. With highly active sexual behavior, IDUs may spread HIV to their non-injecting sexual partners. This behavior is very important because changing sexual risk behavior is more difficult than changing injecting risk behavior (Jarlais and Semaan, 2008; The Centre for Harm Reduction, 2003: 252; Mann, 1996: 149) although HIV transmission through blood-to-blood contact is several times higher than sexual transmission (Tyndall et al., 2002).

According to the HIV/STI Integrated Biological and Behavioral Surveillance in Vietnam (IBBS) (Ministry of Health, 2006: 2), both the following risk behaviors were still unacceptably high among IDUs: needle sharing during the previous 6 months (12%-33%) and having sex with commercial sex workers (CSWs) during the previous 12 months (20%-40%). What is even worse, "condom use is uncommon among IDUs, particularly among IDUs who are HIV-positive" (MOH, 2006: 2). The low rate of condom use among HIV-positive IDUs was noticed with alarm, especially in Angiang, a southern province, in which 45% and 28%, respectively, had unprotected sex with regular partners and with sex workers (MOH, 2006: 26).

As in other southern provinces, where the HIV epidemic is not yet so serious, Vinhlong still has little implementation of the intervention programs and thus is faced with many conditions that increase the epidemic. HIV prevalence among IDUs in Vinhlong is higher than that of any other population. It was up to 20.0% in 2005 and 18.3% in 2006 according to annual sentinel surveillance and the 2007 HIV/AIDS Annual Report from the Pasteur Institute in Ho Chi Minh City (PIHCM, 2007). However, comprehensive understanding of risk behaviors among IDUs, a group that is known as a most-at-risk population (MARPs) and which has the highest HIV prevalence, is lacking. Therefore, it is urgent that we need basic data from IDUs, which will help us understand more about the factors influencing their risk behaviors in order to implement a harm reduction intervention program in Vinhlong.

The objective of this study is to examine the relationship between environmental factors and risk behaviors (needle sharing and inconsistent condom use) among IDUs, controlling for personal factors. However, this study focuses only

on the micro environment and on sociodemographic characteristics and HIV risk behaviors[6] and social support[7].

Methodology

Secondary data from a cross-sectional study on HIV/AIDS Knowledge, Attitudes, Beliefs, and Practices among 360 IDUs who have ever injected drugs during the six months prior to the survey in Vinhlong province, which is a baseline survey of Vietnam HIV/AIDS Prevention Project funded by the World Bank in 2007 was used in this study.

Information using in this study were included three groups, namely, **risk behaviors** with two dependent variables (*needle sharing* and *inconsistent condom use*)**, Environmental factors** with four main independent variables (*living with family, receiving peer educator assistance, receiving health worker assistance, and attending IDU club*)**,** and **Personal factors** with nine control variables (*age, education level, marital status, HIV/AIDS knowledge, perceived HIV status, injecting frequency, injecting duration, number of sexual partners,* and *type of sexual partners*)**.** Some new variables were defined for this analysis such as *needle sharing* if a used needle is borrowed or lent by other IDU, *inconsistent condom use* if a condom is not used consistently with any types of sexual partners (spouse/lover[8], CSW, and casual partner) during the 12 months before the survey, *living with family* if an IDU is living with parents/spouses/siblings, *receiving IDU peer educator assistance* if an IDU has ever received any provision from IDU peer educators[9], namely, condoms, clean syringes and needles, and counseling, *receiving health worker assistance* if an IDU has ever received any provision from health workers, namely, counseling and STI treatment, *perceived HIV-positive status* if an IDU think that his/her current HIV status is positive, and *knowledge of HIV/AIDS* which is based on the national guideline[10] (MOH, 2007: 72). Reaching full five corrected answers are defined as having complete HIV knowledge.

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[6] Sociodemographic characteristics and HIV risk behaviors are fixed with personal factors (age, education level, marital status, HIV knowledge, perceived HIV status, duration of injection, frequency of injection, number of sexual partners, and type of sexual partners)

[7] Social support is fixed with environmental factors (living with family, receiving assistance from peer educators and health workers, and attending IDU clubs)

[8] Lover is defined as a non-paying regular partner who is neither a spouse nor a casual partner

[9] Ex-drug users who are recruited as outreach workers by harm reduction programs. IDU peer educators will approach and provide harm reduction services to current IDUs in community such as providing condoms, clean syringes and needles, counseling, etc.

[10] According to the indicator 21st of national guideline, "Percentage of people in "most-at-risk" populations who correctly identify ways of preventing HIV transmission and who reject major misconceptions about HIV transmission" is calculated by corrected answer of all 5 questions relating to transmission of HIV and misconceptions about HIV: (1) Having only one faithful, uninfected partner can reduce the risk of HIV transmission; (2) Condoms can reduce the risk of HIV transmission; (3) A healthy-looking person can have HIV; (4) Mosquitoes do not transmit HIV; (5) Sharing food does not transmit HIV (MOH, 2007: 72).

Frequencies and cross tabulations were used to describe personal and environmental characteristics as well as risk behaviors of the respondents.

Binary logistic regression was used to examine the relationship between each independent variables (main independent and control variables) and dependent variables (needle sharing, condom use). Simulation will be used to predict probability of risk behaviors when exposed to environmental factors that controlled for personal factors.

Limitation: Because of using a cross-sectional study, it is difficult to establish the cause – effect between independent and dependent variables. Furthermore, the sample size is small with 360 IDUs (Both who had ever had and never had sexual activities in the last 12 months) but it will be smaller when analyzing sexual risk behavior because samples for this analysis are selected only IDUs who had ever had sexual activities.

Results and discussion

Background information

The results of descriptive statistics showed some basic information of the 360 respondents, namely, personal factors with sociodemographic, HIV knowledge and perceived HIV status, and risk behaviors and environmental factors (Table 1 – 4, respectively).

In terms of sociodemographic (Table 1), IDUs were 15-60 with a median age of 27 and the major proportion at the 20-29 age group (53%). Nearly half (48%) IDUs had a secondary education level; and 60% were singles. About HIV/AIDS knowledge and perceived HIV status (Table 2), major proportion (62%) of the participants had incomplete HIV/AIDS knowledge while nearly half (47%) perceived that their HIV status were positive.

Table 1: Distribution of selected sociodemographic characteristics among IDUs in Vinhlong province, Vietnam, 2007

Socio-demographic characteristics	Frequency	Percent
Age group		
15 – 19	47	13.1
20 – 24	82	22.8
25 – 29	109	30.3
30 – 34	44	12.2
35 – 39	37	10.3
40 – 44	15	4.2
45 and over	26	7.2
Total	**360**	**100.0**
Mean = 28.7; Median = 27.0; Min = 15; Max = 60; SD = 9.0		

Table 1: Distribution of selected sociodemographic characteristics among IDUs in Vinhlong province, Vietnam, 2007 *(Continued)*

Socio-demographic characteristics	Frequency	Percent
Education levels		
Illiterate	24	6.7
Primary	117	32.5
Secondary	173	48.1
High school or higher	46	12.8
Total	**360**	**100.0**
Marital status		
Single	217	60.3
Married	92	25.6
Separate/divorce/widow	51	14.2
Total	**360**	**100.0**

Table 2: Distribution of HIV knowledge and perceived status among IDUs in Vinhlong province, Vietnam, 2007

HIV knowledge and perceived status	Frequency	Percent
HIV/AIDS Knowledge		
Incomplete (0-4 scores)	218	61.6
Complete (5 scores)	136	38.4
Total	**354**	**100.0**
Mean = Median = 4.0; Min = 0; Max = 5; SD = 1.1		
Perceived HIV status		
Positive	167	46.6
Negative	141	39.4
Unknown	50	14.0
Total	**358**	**100.0**

In terms of risk behaviors (Tables 3), more than half (58%) injected drugs from 1 to 7 times per week and 28% had less than 1 injection per week. Median duration of injecting drugs is 3 years. Nearly half (47%) of the IDUs had the duration of injecting drugs between 1 and 4 years. Fifteen percents had previously shared needles during the three months prior to the survey. Related to sexual experiences, 79% of the IDUs who had ever had sexual activities during the 12 months prior to the survey. Those having sex with 2 or 3 types of sexual partners (of the total 3 types: spouse/lover, CSW, and casual partner) were 23% whereas more than half (56%) had sex with spouse(s) or lover(s) only. Nearly half (49%) had only 1 sexual partner while 15% had 4 or more sexual partners. The median number of sexual partner of IDU, who had ever had sex, was 2.0. In terms of condom use, only about one-third (34%) IDUs reported consistent condom use with any type of sexual partner. Consistent

condom use was lowest with spouse(s)/lover(s) (31%) while highest with CSW(s) (58%).

Table 3: Distribution of selected injecting and sexual experiences among IDUs in Vinhlong province, Vietnam, 2007

Injecting and sexual experiences characteristic	Frequency	Percent
Injecting frequency		
At least 2 times/day	51	14.2
1-7 times/week	209	58.0
less than 1 time/week	100	27.8
Total	*360*	*100.0*
Injecting duration		
Under 1 year	41	11.4
1-4 years	169	46.9
5-7 years	108	30.0
Over 7 years	42	11.7
Total	*360*	*100.0*
Mean = 5.1; Median = 3.0; Min = 0; Max = 37; SD = 6.6		
Ever sharing needles (borrow or lend)		
Yes	53	14.7
No	307	85.3
Total	*360*	*100.0*
Ever having sexual activity during the last 12 months		
Yes	284	78.9
No	76	21.1
Total	*360*	*100.0*
Types of sexual partners		
Having sex with spouse(s)/lover(s) only	157	55.9
Having sex with CSWs only or casual partner(s) only	59	21.0
Having 2 or 3 types of sexual partners	65	23.1
Total	*281*	*100.0*
Number of sex partners during the last 12 months		
1	139	48.9
2	60	21.1
3	43	15.2
4+	42	14.8
Total	*284*	*100.0*
Mean = 2.3; Median = 2.0; Min = 1; Max = 36; SD = 2.8		

Table 3: Distribution of selected injecting and sexual experiences among IDUs in Vinhlong province, Vietnam, 2007 *(Continued)*

Injecting and sexual experiences characteristic	Frequency	Percent
Condom use with any types of sexual partner(s)		
Consistent	96	34.2
Inconsistent	185	65.8
Total	*281*	*100.0*
Condom use with spouse(s)/lover(s)		
Consistent	68	30.9
consistent	152	69.1
Total	*220*	*100.0*
Condom use with sex worker(s)		
Consistent	60	57.7
Inconsistent	44	42.3
Total	*104*	*100.0*
Condom use with casual sex partner(s)		
Consistent	14	45.2
Inconsistent	17	54.8
Total	*31*	*100.0*

Table 4: Distribution of selected environmental characteristics among IDUs in Vinhlong province, Vietnam, 2007

Environmental characteristic	Frequency	Percent
Living arrangment		
Living with family	332	92.2
Living without family (friend,homeless,…)	28	7.8
Total	360	100.0
Ever received assistance from health worker (HW) (counseling/STI treatment)		
Yes	194	53.9
No	166	46.1
Total	360	100.0
Ever received counseling from HW		
Yes	184	51.1
No	176	48.9
Total	360	100.0
Ever received STI Treatment from HIV		
Yes	54	15.0
No	306	85.0
Total	360	100.0

Table 4: Distribution of selected environmental characteristics among IDUs in Vinhlong province, Vietnam, 2007 *(Continued)*

Environmental characteristic	Frequency	Percent
Ever received assistance from peer ecucator (PE) (condom/syringe/counseling)		
Yes	259	71.9
No	101	28.1
Total	360	100.0
Ever received condom from PE		
Yes	158	43.9
No	202	56.1
Total	360	100.0
Ever received syrlinge from PE		
Yes	186	51.7
No	174	48.3
Total	360	100.0
Ever received counseling from PE		
Yes	207	57.5
No	153	42.5
Total	360	100.0
Ever attended IDU club		
Yes	29	8.1
No	331	91.9
Total	360	100.0

Four environmental characteristics, i.e., living with family, receiving health worker (HW) assistance, receiving peer educator (PE) assistance, and attending IDU clubs are presented in Table 4. Almost all (92%) IDUs in this study were living with their families. More than half (54%) and nearly three-fourths (72%) IDUs had ever received assistance from HW and PE, respectively. Most of the PE assistance was counseling, syringes, and condom providing, which were 58%, 52% and 44%, respectively. Receiving HW assistance were 51% whereas receiving STI treatment was only 15%. The proportion of IDUs who reported that had ever attended IDU club was very small, only 8%.

Condom use by personal and environment factors

Table 5 shows that IDUs who were younger and more educated have used condoms more consistently than their counterparts. Perceiving negative HIV status had greater percentage of consistent condom use than that positive (39% vs. 28%); Percentages of consistent condom use were not much different between groups that had incomplete and complete HIV knowledge (33% vs. 35%); Those who had at least two types of sexual partners were lower consistent condom use than those with only one type of sexual partner (spouse(s)/lover(s) only or CSW(s) only or casual

partner(s) only). Consistent condom use were different regarding number of sexual partners, it was lower at group with 2 sexual partners than that with 1 sexual partner; It was also lower at group with more than 3 sexual partners than that group with 3 sexual partners. However, consistent condom use at group with 3 sexual partners was higher than group with 1 or 2 sexual partners.

In terms of environmental factors, those IDUs, who were living with family or had ever attended IDU clubs, used condom slightly or more consistent than their counterparts (35% and 55% vs. 30% and 32%, respectively). In contrast, those who had ever received assistance from HW or PE had used condoms slightly lower consistent than those had never received (31% and 33% vs. 38% and 37%, respectively).

Needle sharing by personal and environment factors

Table 6 describes that IDUs who were younger, less educated, and had incomplete HIV knowledge shared needles more than their counterparts. Those being separated/ divorced/ widowed had the highest percentage of needle sharing (20%), while it was the lowest at married group (11%); Those IDUs who perceived their HIV positive status shared needles more than those with perception of HIV negative or unknown (23% vs. 8%); The higher frequency of injection they were, the more needle sharing IDUs had; The group that has been injected from 5 to 7 years had the greater percentage of needle sharing than that group with below 5 years (22% vs. 11%). However, the percentage of needle sharing at group with over 7 years of injection was lower than that at group with 5-7 years (12% vs. 11%).

Table 5: Percentage distribution of condom use by personal and environmental factors

Personal and environmental factors	condom use (N=281)			
	Consistent	**Inconsistent**	**Total**	***(n)***
Age				
Under 20	60.7	39.3	100	*(28)*
20-29	36.3	67.7	104	*(146)*
30 and over	24.3	75.7	100	*(107)*
Education				
Low (primary and lower)	23.9	76.1	100	*(117)*
Moderate (secondary)	40.3	59.7	100	*(134)*
High (high school and higher)	46.7	53.3	100	*(30)*
Marital status				
Single	41.8	58.2	100	*(153)*
Married	20.9	79.1	100	*(91)*
Separate/divorce/widow	35.1	64.9	100	*(37)*
HIV knowledge*				
Incomplete (0-4 scores)	33.1	66.9	100	*(163)*
Complete (5 scores)	35.4	64.6	100	*(113)*

Table 5: Percentage distribution of condom use by personal and environmental factors *(Continued)*

Personal and environmental factors	condom use (N=281)			
	Consistent	**Inconsistent**	**Total**	***(n)***
Perceived HIV status**				
Positive	28	72	100	*(125)*
Negative	39	61	100	*(154)*
Types of sexual partners				
Spouse(s)/lover(s) only	33.8	66.2	100	*(157)*
CSWs only or casual partner(s) only	47.5	52.5	100	*(59)*
At least 2 types of sex partners	23.1	76.9	100	*(65)*
Number of sexual partners				
1	37	63	100	*(138)*
2	25	75	100	*(60)*
3	45.2	54.8	100	*(42)*
4+	26.8	73.2	100	*(41)*
Living with family				
Yes	34.5	65.5	100	*(258)*
No	30.4	69.6	100	*(23)*
Receiving health worker assistance				
Yes	31	69	100	*(155)*
No	38.1	61.9	100	*(126)*
Receiving peer educator assistance				
Yes	33.2	66.8	100	*(208)*
No	37	63	100	*(73)*
Attending IDU club				
Yes	54.5	45.5	100	*(22)*
No	32.4	67.6	100	*(259)*

*Note: Due to missing values * 5 cases; ** 2 cases*

Table 6: Percentage distribution of needle sharing by personal and environmental factors

Personal and environmental factors	Sharing needles (N=360)			
	No	**Yes**	**Total**	***(n)***
Age				
Under 20	80.9	19.1	100	*(47)*
20-29	83.8	16.2	100	*(191)*
30 and over	89.3	10.7	100	*(122)*
Education				
Low (primary and lower)	81.6	18.4	100	*(141)*
Moderate (secondary)	86.1	13.9	100	*(173)*
High (high school and higher)	93.5	6.5	100	*(46)*

Table 6: Percentage distribution of needle sharing by personal and environmental factors *(Continued)*

Personal and environmental factors	Sharing needles (N=360)			
	No	Yes	Total	*(n)*
Marital status				
Single	84.8	15.2	100	*(217)*
Married	89.1	10.9	100	*(92)*
Separate/divorce/widow	80.4	19.6	100	*(51)*
HIV knowledge*				
Incomplete (0-4 scores)	80.7	19.3	100	*(218)*
Complete (5 scores)	93.4	6.6	100	*(136)*
Perceived HIV status**				
Positive	77.2	22.8	100	*(167)*
Negative	92.1	7.9	100	*(191)*
Injecting frequency				
At least 2 times/day	74.5	25.5	100	*(51)*
1-7 times/week	85.2	14.8	100	*(209)*
Less than 1 time/week	91.0	9.0	100	*(100)*
Injecting Duration				
Under 5 years	88.6	11.4	100	*(210)*
5-7 years	77.8	22.2	100	*(108)*
Over 7 years	88.1	11.9	100	*(42)*
Number of sexual partners				
0	76.3	23.7	100	*(76)*
1	89.2	10.8	100	*(139)*
2	81.7	18.3	100	*(60)*
3	90.7	9.3	100	*(43)*
4+	88.1	11.9	100	*(42)*
Living with family				
Yes	86.4	13.6	100	*(332)*
No	71.4	28.6	100	*(28)*
Receiving health worker assistance				
Yes	86.6	13.4	100	*(194)*
No	83.7	16.3	100	*(166)*
Receiving peer educator assistance				
Yes	88.0	12.0	100	*(259)*
No	78.2	21.8	100	*(101)*
Attending IDU club				
Yes	96.6	3.4	100	*(29)*
No	84.3	15.7	100	*(331)*

*Note: Due to missing values * 6 cases; ** 2 cases*

Needle sharing was highest at group without sex, compared to those having at least 1 sexual partner. Those who had 2 or more than 3 sexual partners shared needles more than those with 1 or 3 sexual partners (18% and 12% vs. 11% and 9%, respectively). Nevertheless, percentages of needle sharing among groups with at least 3 sexual partners were lower than that among group with 2 sexual partners (9-12% vs. 18%).

Regarding environmental factors, those who were living with family, had ever received assistance from HW or PE, and had ever attended IDU clubs shared needles less than their counterparts (14%, 13%, 12%, and 3% vs. 29%, 16%, 22%, and 16%, respectively).

Effects of environmental factors on risk behaviors

To examine the net effects of environmental factors on risk behaviors such as inconsistent condom use and needle sharing, binary logistic regression models were used because the outcome variables have two categories (yes and no). The results of models are presented in Table 7. Model I considered effects of personal factors on risk behaviors only, whereas Model II focused on effects of environmental factors on risk behaviors when controlled for personal factors. For these analyses, if levels of significant at 0.05, it was considered as statistical significant.

Looking at the effects of personal factors on inconsistent condom use, Model I indicates that age, education, and number of sexual partners were significantly associated with inconsistent condom use. Older IDUs were more likely to use condoms inconsistently than younger IDUs. IDUs aged 30 years old or more were 4.0 times more likely to use condoms inconsistently than the IDUs who were younger than 20. The higher educated the IDUs were, the less inconsistent condom use they had. The IDUs who had secondary school and high school or higher education levels were 62% and 73% less likely to use condom inconsistently than IDUs who had primary education or illiterate. Multiple sexual partners were associated positively with inconsistent condom use. Those IDUs who had 2 sexual partners were 2.6 times more likely to use condom inconsistently than those having only 1 sexual partner, significantly ($p<0.05$). Marital status, HIV knowledge, perceived HIV status, and type of sexual partners did not show the significant relationship with condom use at 0.05 levels. However, statistics shows that those perceiving HIV-positive status were 1.7 times more likely to be associated with inconsistent condom use than those with perception of HIV-negative or unknown status at significant level 0.1.

Table 7: Odds ratios of condom use and needle sharing by environmental factors, after controlling for personal factors

Characteristics	Inconsistent Condom use Odds ratios (N=276)		Sharing needles Odds ratios (N=354)	
	Model I	Model II	Model I	Model II
Age				
Under 20 (ref)				
20-29	**2.41†**	2.04	**0.32***	**0.27***
30 and over	**3.96***	**3.43**	**0.15***	**0.12***
Education				
Primary or illiterate (ref)				
Secondary	**0.38****	**0.39****	0.69	0.68
High school or higher	**0.27****	**0.27****	**0.21***	**0.14***
Marital status				
Single (ref)				
Married	1.58	1.56	1.57	2.02
Separate/divorce/widow	0.83	0.80	1.57	1.37
HIV knowledge				
Incomplete (ref)				
Complete	1.27	1.26	**0.31****	**0.36***
Perceived HIV status				
Negative or unknown (ref)				
Positive	**1.73†**	**1.68†**	**4.10*****	**4.13*****
Types of sexual partners				
Spouse(s)/lover(s) only (ref)				
CSW(s) only or casual partner(s) only	0.57	0.52	-	-
At least 2 types of sex partners	1.49	1.50	-	-
Number of sexual partners (1)				
1 (ref)				
2	**2.56***	**2.71***	-	-
3	0.70	0.72	-	-
4+	1.91	1.94	-	-
Number of sexual partners (2)				
0 (ref)				
1	-	-	0.50	**0.40†**
2	-	-	0.83	0.75
3	-	-	0.38	0.44
4+	-	-	0.48	0.41
Injecting frequency				
At least 2 times/day (ref)				
1-7 times/week	-	-	0.64	0.61
Less than 1 time/week	-	-	**0.35†**	**0.32†**

Table 7: Odds ratios of condom use and needle sharing by environmental factors, after controlling for personal factors *(Continued)*

Characteristics	Inconsistent Condom use Odds ratios (N=276)		Sharing needles Odds ratios (N=354)	
	Model I	**Model II**	**Model I**	**Model II**
Injecting duration				
Under 5 years (ref)				
5-7 years	-	-	**3.45****	**3.29****
Over 7 year	-	-	1.37	1.16
Living with family				
No (ref)				
Yes	-	0.65	-	**0.29***
Receiving peer educator assistance				
No (ref)				
Yes	-	1.17	-	**0.43***
Receiving health worker assistance				
No (ref)				
Yes	-	1.46	-	1.47
Attending IDU club				
No (ref)				
Yes	-	**0.32***	-	0.19
LR chi square	**44.87*****	**50.97*****	**57.97*****	**69.54*****
Pseudo R square	**0.127**	**0.144**	**0.199**	**0.238**

*Note: † p<0.10; * p<0.05; ** p< 0.01; *** p< 0.001*

In the Model 2, environmental variables were included in order to examine the net effects of environmental factors on condom use when controlled for personal factors. The results indicate that those who had ever attended IDU clubs were 68% less likely to use condom inconsistently than those had never attended. Total the Model II explains for 14% variation of inconsistent condom use among IDUs ($p<0.001$).

Similarly, Model I of needle sharing in Table 7 also presents the results of binary logistic regression between personal variables and needle sharing that there were significantly associated between needle sharing and age, education, HIV knowledge, perceived HIV status, and injecting duration. IDUs aged 20-29 and 30 or more were 68% and 85% less likely to share needles than those younger than 20 significantly ($p<0.05$). Having higher education levels were negatively associated with needle sharing. The group with high school or higher educated was 79% less likely to share needles than that with primary educated or illiterate. Those who had complete HIV knowledge were 69% less likely to share needles than those with incomplete HIV knowledge significantly ($p<0.01$) while perceiving HIV-positive status were 4.1 times more likely to be associated with needle sharing than those with

perception of HIV-negative or unknown status significantly ($p<0.001$). The longer injecting durations were positively associated with needle sharing. Those who have been injected for 5-7 years were 3.5 times more likely to share needles than those with less than 5 years injection ($p<0.01$). Although injecting frequency was not significantly associated with needle sharing, statistics also indicate that having less than 1 injection per week were 65% less likely to be associated with needle sharing than those with at least 2 injections per day ($p<0.10$).

Although the Model I did not show any relationship between needle sharing and marital status and number of sexual partners, total the model still explains for 20% the variation of needle sharing ($p<0.001$) among IDUs in Vinhlong province.

Likewise, environmental variables were included in the Model II of needle sharing to determine the net effects of environment on needle sharing when controlled for personal factors. The results indicate that there were only two environmental variables that were associated with needle sharing, i.e., living with family and receiving PE assistance. Those IDUs who were living with their family and had ever received PE assistance were 71% and 57% less likely to share needles than those were not living with families or had not received any PE assistance ($p<0.05$).

Interestingly, number of sexual partners was not associated with needle sharing in the Model I but it was associated in the Model II at level significant 0.10 after environmental variables were included. Those IUDs with 1 sexual partner were 60% less likely to share needles than those with no sexual partner ($p<0.10$). Total the Model II explains for 24% variation of needle sharing when considering on environmental factors, controlled for personal factors ($p<0.001$). It means that environmental factors increase 4% explanation of needle sharing variation (24% vs. 20%).

Simulation results

The odds ratios obtained from logistic regression models are used to generate a series of predicted probabilities of having/ not having risk behaviors for different values of significant individual variables. The results are displayed in Figure 1, 2, and 3.

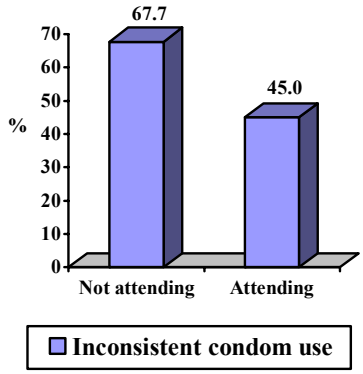

Figure 1: Simulated effects of attending IDU clubs on inconsistent condom use

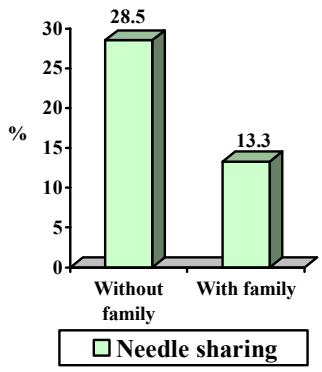

Figure 2: Simulated effects of living with family on needle sharing

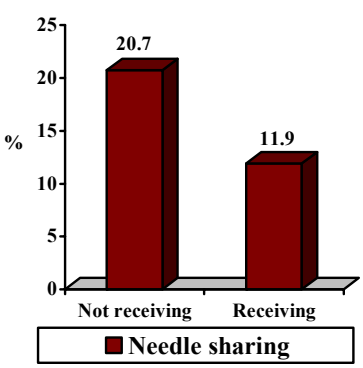

Figure 3: Simulated effects of receiving peer educator assistance on needle sharing

Figure 1 displays the net effects of attending IDU clubs on inconsistent condom use. In the hypothetical situation of no IDUs attended IDU clubs, the predicted proportion of IDUs using condom inconsistently would be 67.7%. On the contrary, in the scenario of all IDUs attended IDU clubs, the predicted proportion of IDUs using condom inconsistently decreases to 45.0%. The results suggest that attending IDUs clubs effects on inconsistent condom use. Figures 2 and 3 display the net effects of living with family and receiving PE assistance on needle sharing. In the hypothetical situation of no IDUs lived with their family and no receiving PE assistance, the predicted proportion of IDUs sharing needles would be 28.5% and 20.7%, respectively. Conversely, in the scenario of all IDUs lived with their families and received PE assistance, the predicted proportion of IDUs sharing needles decreases to 13.3% and 11.9%, respectively. The results suggest that living with family and receiving PE assistance effect on needle sharing.

Discussion

Similar to findings from previous studies (MOH, 2006), a major proportion of IDUs in this study were young, had little education, and were unmarried; this group also had sex with both multiple partners and multiple types of sexual partners. Half of the IDUs had two sexual partners and 23% had at least two types of sexual partners although the proportion of risk behavior, in terms of needle sharing, was lower compared to those in southern provinces (15% vs. 25-37%) (MOH, 2006: 49). Inconsistent condom use was still high (66%), as it was in other provinces such as Angiang, Cantho, and HCM City (MOH, 2006: 51).

Some findings from this study reconfirmed previous conclusions that environment influences risk behaviors of IDUs. For example, attending an IDU club reduced the rate of inconsistent condom use (FHI, 2009; MOH, 2006) and living with family and receiving peer educator assistance reduced needle sharing (Thanh et al., 2008; Marvel et al., 2009; Qureshi et al., 2002). In practice, behavior change

communication (BCC) intervention on IDUs was based mostly on ex-users or "former" IDUs who got training and cooperated with the project and known as peer educators. The peer educator-based intervention indicated good results on risk behaviors reduction, i.e., reducing prevalence of needle sharing as well as reducing prevalence of inconsistent condom use (MOH, 2006). Peer educators play important roles in providing BCC information and counseling to IDUs because of their advantages in reaching other IDUs "by increasing trust and credibility and having an equal level of communication." Thus, they contribute to the successes of the intervention by providing directly to IDUs "knowledge and skills and allowing them to have a meaningful function in the program" (UN, 2004: 31). For instance, the ECHO Model (The Eastern Connecticut Health Outreach Model), which provides harm reduction intervention for IDUs based on IDU "clubs" (a different name for drop-in centers) and peer educators' activities. The clubs provide BCC materials, educational and supportive activities, and counseling as well as care services and referral; peer educators provide regularly visiting to other IUDs in community with counseling, condoms, and clean syringe and needles. The ECHO Model demonstrated many successes in reducing risk behaviors among IDUs in Haiphong and Quangninh. It is considered as a safe environment for IDUs (FHI, 2009).

In addition, in terms of reducing HIV risk behaviors among adolescents, family-based HIV preventions are introduced as family therapy to support individual level interventions (peer groups) because of the important roles parents play in educating and influencing their adolescent children in terms of primary sexuality as well as in support for treatment of drug abuse. The family-based HIV intervention indicated successful in reducing drug abuse (Marvel et al., 2009) or sexual risk (Parsons et al., 1998). Living with family is also related to lower frequency of injection drugs (Qureshi et al., 2002).

This study also displays consistent results with previous studies, namely, that young age and low educational levels were associated positively with inconsistent condom use and needle sharing (Thanh et al., 2008); that incomplete HIV knowledge, perceived HIV-positive status, and long duration of injection were associated positively with needle sharing (Thanh et al., 2008; Purcell et al., 2006). Perceiving HIV-positive status was associated positively with risk behaviors among IDUs in this study. Nevertheless, it is difficult to conclude the cause-effect from the cross-sectional data. Many cross sectional studies in Vietnam and in the U.S confirmed that PLHIV had high prevalence of risk behaviors (Thanh et al., 2008; Rosengard et al., 2004; Tyndall et al., 2002). HIV-positive IDUs tended to have more risk behaviors, e.g., they tended to have unprotected sex with their sexual partners in the cross-sectional study in the U.S. (Purcell et al., 2006). However, the prospective cohort study in Canada indicated that HIV-positive IDUs were less likely to share needle than those were HIV-negative (Wood et al., 2001). Thus, there was little supported evidences for a conclusion that IDUs who perceived that their HIV-positive status were more likely to practice risk behaviors. The suitable conclusion should be that there was a positive association between perceiving HIV-positive status and practicing risk behaviors.

This is an important implication for both preventing HIV infection among others and for re-infection among IDUs.

However, some unanticipated findings from this study were indicated as well. Regarding personal factors, marital status was associated neither with condom use nor needle sharing. This finding contradicted a conclusion of Persaud et al. (2000) that marital status was related to condom use in the study in Guyana. Having ever used a condom was associated with being married or cohabiting (Persaud et al., 2000); and sharing syringes was associated with type of sex partners among IDUs in Canada (Shaw et al., 2007). However, it had a similar result with an older study of Mandell et al. (1989), which found that marital status was not related with needle sharing. In addition, HIV knowledge and type of sexual partners were not associated with condom use in this study. Whereas having low HIV/AIDS knowledge was significantly associated with continued sexual risk behaviors among HIV-positive IDUs in the U.S. (Purcell et al., 2006); or condoms were less likely to be used with the primary partners or regular partners among IDUs in the U.S. (Purcell et al., 2006; Tyndall et al., 2002) while they were more likely to be used with casual partners (Marrero et al., 2002).

Furthermore, regarding environmental factors, neither receiving peer educator assistance nor living with family had any effect on condom use and attending IDU clubs was not effect on needle sharing, despite the fact that there was a relationship confirmed by previous studies (Thanh et al., 2008; Tyndall et al., 2002; Marvel et al., 2009; Parsons et al., 1998; FHI, 2009; MOH, 2006). The feasible reasons for these inconsistent results may be due to a small sample size (N=276 for condom use and 354 for needle sharing).

Also, receiving health worker assistance showed no relationship with either condom use or needle sharing. The different levels of communication or even a stigmatization from health workers (Thi et al., 2008) may lead to the least effect on changing behaviors of IDUs who received health worker assistance. This unexpected result reconfirmed the important roles of peer educators due to their advantages in approaching and providing intervention for IDUs (UN, 2004).

Conclusion and recommendations

Conclusion

The key findings from this research are that there are three environmental factors which affect risk behaviors of IDUs, i.e., attending IDU clubs were 68% less likely to be associated with inconsistent condom use ($p<0.05$); receiving PE assistance and living with family were 57% and 71% less likely to be associated with needle sharing ($p<0.05$).

The results also reconfirmed that some personal factors were associated with risk behaviors. Regarding sexual risk behavior, factors positively associated with inconsistent condom use were oldest age 30 years or older, and having 2 sexual partners comparing to the youngest 20 years or younger, and having 1 sexual partner,

respectively. In addition, those having secondary and high school or higher educated were less likely to be associated with inconsistent condom use than those with primary educated or illiterate. In terms of injecting risk behavior, factors negatively associated with needle sharing were age 20-29 and 30 or older, high school or higher educated, and complete HIV knowledge, comparing to the age under 20, primary educated or illiterate, and incomplete HIV knowledge, respectively. In contrast, those perceiving HIV positive status and having 5-7 years of injection were more likely to be associated with needle sharing than those perceiving HIV negative or unknown status and having less than 5 years of injection, respectively.

Recommendations for harm reduction intervention programs

(1) Harm reduction intervention for IDUs in Vinhlong needs to be more advocated and supported by policy makers and stakeholders.

(2) The intervention programs should strengthen environmental factors which are included peer educator assistance, IDU club support, and family support. Peer educator assistance is included clean syringes and needles and condoms provision as well as personal counseling. IDU club will provide BCC materials, education and counseling as well as care services and referral. Condoms and clean syringes and needles are also provided in the clubs. Family will create a good relationship between family members as well as physical and mental support for IDUs.

(3) The peer educators' networks should be set up to target IDUs effectively. The networks are not only considered in quantity but also in quality of peer educators, especially in counseling skill in order to enhance their roles in providing harm reduction services efficiently.

Recommendations for future 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 next studies which will represent for IDUs in Vinhlong and even in Vietnam. A large sample size may increase the usefulness of logistic regression analysis and the results may be possible to be applied for other provinces.

The combination of qualitative and quantitative should be conducted in order to indicate more factors, in terms of environment, that importantly influence their risk behaviors. In addition, since the cross-sectional study with its weak point that is not allowed to conclude the cause – effect, the longitudinal studies (e.g., panel studies) may solve this problem.

Moreover, besides studying micro environments as they were in this study, further studies should explore the macro environment such as economic and policy environments, which were not able to be mentioned in this study due to lack of necessary information.

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Factors Influencing Premarital Sex Behaviour of University Student Central Java

Ida Susilaksmi, & Roro Rukmi

Abstract

The study examined factors influencing premarital sex behavior of university students in Central Java. It was a cross sectional study, employed a survey method using structured and self-administered questionnaire. The 500 samples were undertaken at aged 18-24 years in urban Central Java.

Study shows that respondents were mostly single, moslem and Javanese. Although most male (60%) and female (75%) students had western general lifestyle, there were only 9% of males and 3% of females agreed with premarital sexual intercourse. In term of gender attitude, 40% of males and 14% of females were conservative. However, 22% of males and 6% of females engaged in premarital sexual intercourse. In terms of level precautions taken within sexual experience, however, the findings show a picture of greater risk. Just 28% of males and 7% of females reported condom use at last intercourse, with the remainder using ineffective contraceptive methods such as withdrawal (40% of males and 67% of females) or nothing at all (28% of males and 20% of females).

Bivariate analysis demonstrated factors associated with premarital sexual intercourse were religiousity, general lifestyles, level of social activity, sexual attitude and gender attitude

Keywords: Factors/Premarital/Sex/Behavior/University/ Student/Central Java

Introduction

The sexual health of young people has become a major concern of research topic on adolescent reproductive health in Indonesia. It arises from the necessity to design intervention programs to reduce unwanted pregnancies and enhance HIV-AIDS prevention. The sexual and reproductive health needs of the unmarried young people have been largely ignored by existing health services in this country. Therefore, there is a strong need to provide such services and to undertake research which more focused in depth studies in order to understand the complexity of young people sexual and reproductive health (Gubhaju, 2002)

Many studies have been conducted quantitatively and qualitatively in Indonesia that deal exclusively with sexual behaviour of young people, but the information obtained was still limited on understanding the complexity of sexual behaviour. Perhaps, the apparent lack of depth in Indonesia studies of sexual behaviour reflected the many methodological and cultural constraints that are evolved (Cleland and Ferry, 1995). There were important concerns about how to reach and involve people in providing reliable information on private and sensitive topics (Cleland and Ferry, 1995). At the same time, there were also concerns about the political acceptability of research in this area, especially in Central Java which has little tradition of open discussion of sexuality (Cleland and Ferry, 1995).

In Indonesia, the number of adolescent and young people is growing rapidly. Between year 1997 and 2000, the 15-24 year-old age group has increased from 21-43 millions or from 18% to 21% of Indonesia's total population (Achmad and Xenos, 2001). The rapid growth of youth population has created pressure to expand education, health and employment program aimed at this age group. Government policy maker are also concerned because adolescents and young people are particularly prone to various types of risky behavior (Achmad and Xenos, 2001).

The degree of premarital sexual experience is one component of young people's social reality in Central Java. Premarital sexual intercourse is not a practice or reported practice, which is anyway condoned by society (Achmad and Xenos, 2001). It is increasingly recognized that Indonesian young people are facing rapid social change because of globalization, industrialization and transformation of cultural values and norms (Achmad and Xenos, 2001).

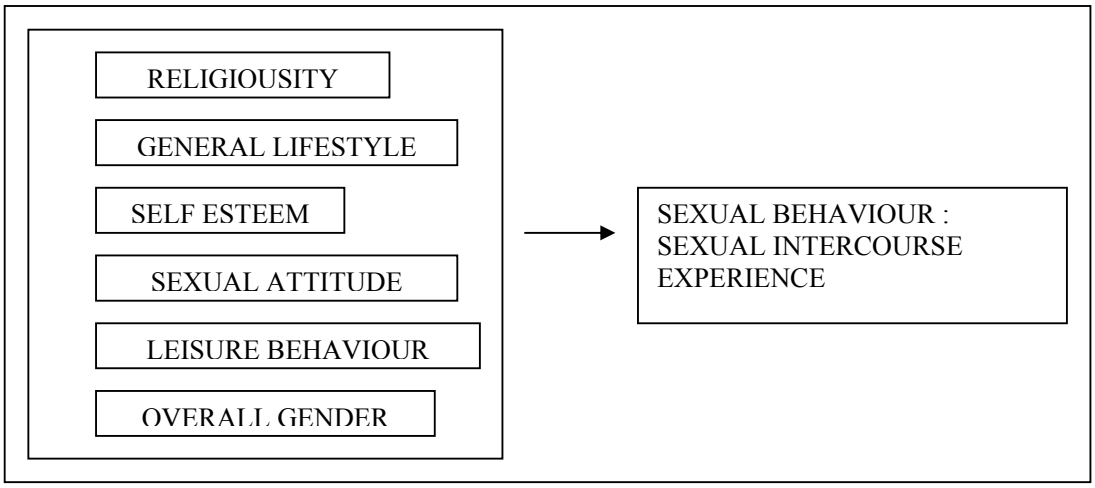
The various studies that have been conducted trough quantitative surveys, such as demographic health survey (DHS) and KAP (knowledge, attitude and practice) surveys indicated that the percentage of youth reporting premarital sexual intercourse range between 2% and 27%. For females, the rate of premarital sexual activity were concentrated in the range of 2% to 6%. Almost all young people expressed disapproval of sexual activity outside marriage, although small proportions approve it if a couple planned to marry (Achmad et al, 1999).

Among young university students in Semarang, the practice of dating and having close relationship (pacaran or being a lover, usually without sexual relation) is common. Typically, dating comprises holding hands, kissing, necking, touching

breasts (48%) and petting (25%-28%) but rarely intercourse (PILAR PKBI Central Java, 2000, 2003; Sembodo, 2000).

The primary purpose of this study is to identify the level of youth sexual behaviour and examine factors which influence their sexual behaviour which can contribute towards policy formulation and program development for young people sexual and reproductive health.

CONCEPTUAL FRAMEWORK



Methods

This survey covered three big cities in Central Java; namely Semarang, Purwokerto, and Surakarta. It used a quota sampling design strategy, which is non-probability aimed to make the sample representative of the population by setting and filling quota control (Gilbert, 2001). Three-stage sampling involved firstly, the selection of the universities in three cities (Semarang, Surakarta, and Purwokerto) in term of the proportion of the number of students; secondly, quota sampling by departments, and thirdly, by age and sex.

Participants were 500 undergraduates (265 males and 235 females) in the age of 18-24 years. They were recruited from 8 universities in three big cities in Central Java. This study employed the type of self-administration in which the questionnaire was provided to respondents with an interviewer present. The presence of the interviewer ensured a high completion rate and can be used to reassure respondents, to answer their queries, and even edit their completed questionnaire.

Result and Discussion

Socio-demographic characteristic of the respondents

Age

The total sample comprises 500 students who were all aged 18-24 year old. The age group proportion were somewhat unequal between sexes, there were more females in the age of 18-20 years and more males in the age of 21-24 years. The total sample included 265 (53%) young males and 235 (47%) young females. The age distribution is shown in Table.1

Ethnicity

Young students in the survey are rather a homogenous group. More than four-fifth of them are Javanese (84% males and 92% females). The others are Sundanese and from other ethnic groups including Chinese. Therefore, it can be said that the study deals with a fairly homogenous groip, Javanese students. Thus the study does not seek to generalize the findings from other groups or entities.

Religion

Table 1 shows the denominational orientation of the sample. As can be seen, the sample is basically Muslim as indeed is the majority of the population of Indonesia. More than 80% of respondents are Moslem, more than 15% are Christian and there is an extremely small proportion of Buddhists.

The actual premarital sexual experience

The level of sexual experience of the sample is relatively low in comparison to other sexual culture such as Thailand, Brazil, and North America and other Western Countries (Ford, 1992; Ford and Kittisuksathit, 1994; Ford et al, 2003), with only 22% of males and 6% of females reporting having ever engaged in premarital sexual intercourse. (see Table 2)

Moreover, reinforcing the picture of an overall low pattern of sexual risk, the majority (60 % of males and 80 % of females) of such sexual intercourse took place within a committed or serious relationship. The reported cases of casual sexual contact, for instance with a sex worker, was very low (7 % of males). The majority of sexual experience respondents (66% of males and 80% of females) reported engaging in intercourse with only one partner in the past twelve months, with the length of relationship before intercourse took place often being lengthy (over one year for 26% of males and 47% of females). In terms of sexual orientation practically the whole sample (99%) identified themselves as heterosexual.

Given that such behaviours as sexual intercourse before marriage and especially casual sex and homosexuality are seriously against Javanese socio-cultural norms, the low level of premarital sex, casual sex, and homosexual orientation may be expected to have involved some under reporting. But, there is confidence in the broad validity of the results based upon the following findings. The behavioral findings of

individuals consistently linked with attitudinal findings. For example, reported non-premarital sex linked with a belief in 'no sex before marriage', whilst sexual experience linked with an ambivalent or more positive attitude regarding sex before marriage.

In terms of level precautions taken within sexual experience, however, the findings show a picture of greater risk. Just 28% of males and 7% of females reported condom use at last intercourse, with the remainder using ineffective contraceptive methods such as withdrawal (40% of males and 67% of females) or nothing at all (28% of males and 20% of females).

It is important to note here that contraceptive services are not provider for the unmarried in Indonesia. A range of factors including fear of being seen to make use of contraceptive services (as evidence of 'sinful' behaviour), lack of perceived risk, and lack of communication between partners combine to make it highly unlikely that any effective contraceptive or prophylactic precautions are taken by young people.

General lifestyle

In Indonesia, and of course in Central Java, young people face daily contact with stimulus of explicit material through media such as television programs, movies, videos, magazines, books and internet. This mass media introduces audiences and readers to salient landmark of young people, in effect teaching them how to transform themselves from adolescents into proper adults according to prevailing cultural standards.

In this study, lifestyles were measured by the respondents to six items on the preferences in terms of clothes, foods, music, magazines/novels, and television program and frequency in accessing internet. The respondent's preferences in lifestyle were categorized as western or traditional general lifestyle. The finding shows that the majority of respondent's preferences were categorized as modern or western lifestyle (53% of males and 61% of females).

Religiousity

In this study, religiousity of respondents was identified by considering some components. One way to measure the religiousity would be to examine the respondent respond to some question which related to their religious activities, such as how often on average they spend their time for praying, participating in mosque or church activity, and running religious related organization activities. The majority of students (58.3%) were categorized in moderate religiousity, particularly female students were likely to be more religious than males. Only 5.5% females were indicated very not religious compare with 11.7% of males students.

Religiousity has long been considered as an important influence on sexuality, which has resulted in reported differences between religiously 'active' and 'inactive' persons particularly with regard to premarital sexual intercourse (Kinsey, Pomeroy, Martin & Gebard, 1953, cited in Davidson et al, 1995). Religious also has component of the culture of any society, is involved in specific and non specific ways with the experience of human sexuality (Brusich, 1990).

Specific religious doctrines may influence sexuality by prescribing or prohibiting certain behaviours. In general, therefore, religion has an effect on sexuality by the way it shapes a person's concept of him/herself as sexual being and may influence, directly or indirectly, decisions about what people do sexually.

Self Esteem

The sources for the development of self esteem of young people rest primarily in reflected appraisal in terms of their competency andt self efficacy in comparison with those of their peers, in order to discern their level of worth (Hendry et al, 1993). The study identified majority of Javanese students experiencing fairly self esteem (40,9% of males and 39,4% of females). Young males tend to have higher self esteem than females (37,5% / 29,4%).

When young people enter to a new period in the life course it may challenge the self image, particularly in individuals' self evaluation, as they attempt new asks in which they may succeed or fail (Hendry et al, 1993). In the case of Indonesian and Javanese students, perhaps the threat of unemployment or uncertainty of socio-economic conditions in their future life after leaving school may in circumstances lead to depression and finally lower their self esteem (Hendry et al, 1993). On the other hand, with maturation young students may also improve their interpersonal skills. They may thus be more capable of selecting romantic partners and, in this context, of enhancing their self esteem.

Leisure Behavior

This study also includes a set of question on social activity, in order to measure and asses any association between the pattern of student sexual behaviour and the level of social activity. The social activity index items were selected to measure respondents' involvement in activities in places or environments were sexual relationship are highly likely to be contracted. These index item include visits to night clubs, staying away overnight, engaging in smoking, drinking alcohol, taking drugs, watching pornography and so forth.

Although the majority of Javanese students show a low level social activity, substantial proportions of young males and females (85% / 55%) have at some time watched pornography and been to parties in homes or boarding houses (59% / 58%). Compared to females, the majority of males had higher levels of social activity.

Sexual Attitude

In assessing sexual lifestyles it is also useful to examine attitudes which may be viewed as both influences upon, and rationalization of, sexual activity. The finding revealed that the majority of both male and female respondents considered premarital sexual intercourse to be unacceptable for them personally. Only 9 % of males and 3% of females consider premarital sexual intercourse personally acceptable (see Table 4).

The majority of studies of sexual norms that have been done in Asian countries show that there is a marked 'double standards' which accepts, or at least tolerates, sex before marriage for young men but not for young women. These

findings show that only slightly higher percentage accept premarital sex for males than females. Both males and females hold the same pattern of attitudes to premarital sex; however, a higher proportion of the males sample has a neutral perspective on it. Although some social sanction apply to both sexes, there is more social stigmatization and criticism reserved for women than for men, reflecting the 'double standard' found in most Asian countries (Ford and Kittisuksathit, 1994).

In term of attitudes to condom use, the finding shows a quarter of males (24%) and more than a quarter of females (27%) do not agree to use a condom with a study partner. The main reasons for this revolve around the lack of perceived risk, reduction of pleasure, but probably most importantly that condom is only acceptable for married couples and only for use with sex workers, so that is provides a poor image for the unmarried.

There are varied attitudes pertaining to other sexual practices (oral sex and masturbation), pornography and homosexuality between males and females. In comparing attitudes towards these variables, the pattern of disparity between males and females is reserved. Males tend to be more accepting than females regarding other sexual practices. In fact, most respondents generally have a neutral or 'not sure ' perspective on these sexual matters. These findings reinforce the view of Javanese youth culture undergoing social change and feeling uncertainty and ambivalence about their sexual attitudes and values.

The pattern of overall sexual attitudes reported that the young males have more liberal sexual attitudes than females (40% / 20%) whereas young females have more traditional and restrictive sexual values (37% / 24%). In fact, again a substantial percentage of both males and females responded 'uncertainty' or 'unsure' regarding sexual values. It could be note that a higher percentage of both males and females express liberal sexual attitudes than reported actual premarital sexual intercourse, possibly indicating the potential for higher levels of such behaviour. The range of pattern and reported behaviour reflected different patterns of sexual lifestyles among Javanese youth. It shows that there is a tendency running from a traditional restrictive to a possibly a modern-romantic sexuality.

Gender Attitude

This study identifies gender attitude, which consists of overall gender attitude. This study revealed that the majority of young females tend to be more egalitarian than young males. It is shown by the overall gender attitude which indicated that 40% of males and only 14% of females hold conservative/traditional gender attitudes. Most young males were more endorsed traditional gender attitudes in sexuality than were females. Furthermore a much lower percentage of the young men than women adhere to egalitarian gender attitudes with regard to sexuality. These finding probably indicate a measure of the double standard among youth Javanese.

Cross-tabulation and logistic regression analysis

The study demonstrated that young students' religiousity, general lifestyle, leisure behaviour, attitude to premarital sex, and overall sexual attitude indicated by

those characteristics are associated with reported premarital sexual intercourse (see Table). All associations between leisure behaviour, attitude to premarital sex, and overall sexual attitude as independent variables and premarital sexual intercourse experience as deopendent variable were statistically significant for both males and females. Therefore, the respondents with such characteristic as high level of leisure behaviour, positive attitude to premarital sexual intercourse and liberal sexual attitudes tended to have higher levels of premarital sexual intercourse than those respondents without those characteristics.

Furthermore, there are no statistically significant associations between religiousity and sexual behaviour in the female cases, since the Chi-square tests were not statistically significant (p>0,05). In fact, there is a small numerical association for both cases, although it is not statistically significant.

The young males with low level of religiousity (not religious and very not religious) were more likely to engage premarital intercourse than the young males who have high level of religiousity. The young female students who have Western and very Western lifestyle taste were more likely to develop premarital sexual intercourse than the young females who hold traditional taste. It is realized that there are several limitations of bivariate analysis in showing associations between two variables. The association is always based on the assumption of linear relationship. Furthermore, the contingency tables only demonstrated simple associations between two variables, while the interrelationships among those variables were complex. The occurrence of premarital sexual intercourse might be influenced by multiple variables. Perhaps the bivariate analysis could not fully control the associations between independent variable and dependent variable because of interactions with other variable.

The logistic regression analysis of female cases demonstrated that general lifestyle is very important variable to explain the occurrence of premarital sexual intercourse among young female. More over the logistic regression analysis suggested that the Western lifestyle taste and positive attitude to premarital sex variables were the main predictor of the occurrence of premarital sex of young female. The probability of the occurrence of premarital sexual intercourse of young female with those characteristics was 68%.

The logistic regression analysis of male cases indicated that religiousity, self-esteem, and level of social activity are important variables to influence the occurrence of premarital sex among young males.

This multivariate association demonstrated that moderate religiousity, high and very high level of social activity, neutral and positive attitudes to premarital sex were the predictors of the occurrence of premarital sex among the males. Low self-esteem variable provided negative association to the occurrence of premarital sexual experience, because the unstandardized (B) indicated negative score (-1,564). The logistic regression analysis suggested that the high level of social activity was the best predictor to the occurrence of premarital sex. Moreover, the probability of the occurrence of premarital sexual intercourse of young males with those characteristics was 99 %.

In summary, the bivariate analysis and multivariate analysis suggested that certain independent variables are important towards the occurrence of premarital intercourse for both males and females. The independent variable which influence to the occurrence of premarital sexual intercourse for both males and females was positive attitudes to premarital sex. High and very high level of social activity, moderate religiousity provided positive contribution to the occurrence of premarital sex among males. Meanwhile, Western lifestyle taste variable only provide the influence to the occurrence of premarital sex among females. These independent variables, which effect to the occurrence of premarital sexual intercourse among males and females, are important to be considered and emphasized to elaborate in further analysis.

Conclusion

This study revealed the occurrence of premarital sexual intercourse was relatively low in comparison to other sexual cultures. Only 22% of males and 6% of females have ever engaged in premarital sex. It means that Javanese youth sexual lifestyle are fairly begin of risk pattern with regard to the threats of HIV-AIDS and other STI. Meanwhile, bivariate analysis demonstrated that the pattern of level of sexual experience was characterized by the level of social activity, level of religiousity and general lifestyle taste.

The religiousity and level of social activity factors also provided positive association to the occurrence of premarital sex among male sample and general lifestyle factor provided positive association to the occurrence of premarital sex among young females.

Multivariate analysis identified that the occurrence of premarital sexual intercourse among females more likely to develop when there were positive attitudes to premarital sex and Western cultural taste. The probability of the occurrence of premarital sexual with those characteristics was 68 %. Whereas, the occurrence of premarital sexual intercourse among young males, was more likely to emerge when there were moderate (as opposite to high) religiousity, high and very high level of social activity and positive and neutral perspective on premarital sex. The probability of the occurrence of premarital sex based on those was 99 %.

The finding revealed the primary importance of socio-sexual behaviour pattern for the focus on policy development. This study suggests that there are key priorities that could protect young people sexual and reproductive health care in Central Java. The first priority is to continue in maintaining and promoting the majority of traditional restrictive sexual behaviour in order to protect young people's sexual and reproductive health care and prevent from the threats of HIV-AIDS and other STI. The second priority is to promote and improve safer sex bahaviour in order to prevent from unwanted pregnancy, and the threats of HIV-AIDS and other STI.

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Notes

Table 1: Frequency and percent distribution of age, ethnicity, and religion of respondent

Characteristic	Male		Female	
	Frequency	%	Frequency	%
Age				
18-20	93	35	113	48
21-24	172	65	122	52
Ethnicity				
Javanese	223	84	216	92
Sundanese	13	5	7	3
Others	29	11	12	5
Religion				
Islam	220	83	204	87
Christian	83	16	31	13
Buddhism	3	1	0	0

(n = 500) Chi-Square 0.00 is highly statistically significant P<0.05

Table 2: Frequency and percent distribution of actual sexual experience

Sexual Experience	Male		Female	
	Frequency	%	Frequency	%
Premarital	58	22	15	6
Marital	4	1	3	1
Never	203	7	217	3

(n = 500) Chi-Square is not statistically significant P>0.05

Table 3: Frequency and percent distribution of type of contraception use at last intercourse

Type of contraception use	Male		Female	
	Frequency	%	Frequency	%
Condom	16	28	1	7
Withdrawal	23	40	10	67
Nothing	16	28	3	20
Calendar	3	5	0	0
Other	0	0	1	6

(n = 500) Chi square 0.000 is highly statistically significant at P<0.05

Table 4: Frequency and percent distribution of attitudes to premarital sexual intercourse

Attitude to premarital sex	Male		Female	
	Frequency	%	Frequency	%
Agree	24	9	6	3
Neutral	134	51	84	35
Disagree	107	40	145	62

(n = 500) Chi square 0.000 is highly statistically significant at P<0.05

Table 5: Frequency and percent distribution of attitudes to condom use

Attitude to condom use	Male		Female	
	Frequency	%	Frequency	%
Agree	64	24	63	27
Neutral	185	70	160	68
Disagree	16	6	12	5

(n = 500) Chi square 0.000 is highly statistically significant at P<0.05

Table 6: Frequency and percent distribution of attitudes to other sexual practices, pornography and homosexuality

Attitude	Male		Female		Significant
	Frequency	%	Frequency	%	
Attitudes to other sexual activity					
Disagree	58	22	89	38	
Neutral	151	57	129	55	
Agree	56	21	16	7	P<0.05
Attitudes to pornography					
Disagree	40	15	89	38	
Neutral	185	70	136	58	
Agree	40	15	10	4	P<0.05
Attitude to homosexuality					
Disagree	132	50	115	49	
Neutral	106	40	110	47	
Agree	27	10	10	4	P<0.05

(n = 500) Chi square is statistically significant at P<0.05

Table 7: Frequency and percent distribution of overall sexual attitudes

Overall sexual attitude	**Male**		**Female**		**Significant**
	Frequency	%	Frequency	%	
Attitudes to other sexual activity					
Strongly restrictive	106	4	24	10	
Restrictive	53	20	63	27	
Both restrictive and liberal	93	37	101	43	
Liberal	74	28	42	18	
Strongly liberal	32	12	5	2	P<0.05

(n=500) Chi-square is 0.000 is highly statistically significant (p<0.05)

Table 8: Frequency and percent distribution of attitudes to overall gender attitude

Overall gender attitude	Male		Female	
	Frequency	%	Frequency	%
Strongly conservative	32	12	2	1
Conservative	74	28	31	13
Both conservative and modern modern	114	43	101	43
Modern	37	14	78	33
Strongly modern	8	3	23	10

(n = 500) Chi-Square is not statistically significant P>0.05

Table 9: Cross-tabulation between religiousity, general lifestyle, leisure behaviour, attitude to premarital sexual intercourse, sexual attitudes and sexual intercourse experience both male and female

Variables	**Sexual intercourse experience (Male) (n=265)**		**Sexual intercourse experience (Male) (n=265)**	
	Ever (%)	**Never (%)**	**Ever (%)**	**Never (%)**
Religiousity				
Very religious	0	14	6	9
Religious	8	22	11	18
Moderate	48	44	67	64
Less religious	18	13	6	4
Very less religious	26	7	11	5
Very religious	0	14	6	9
Chi-square test	P<0.05		n.s	
General lifestyle				
Very western	30	24	50	24
Western	33	27	40	35
Traditional	18	29	11	29
Very traditional	20	21	0	13
Chi-square test	n.s		P<0.05	
Leisure behaviour				
Very low level	57	11	11	2
Low level	31	27	22	9
High level	8	45	44	49
Very high level	3	18	22	40
Chi-square test	P<0.05		P<0.05	
Attitude to premarital sexual intercourse				
Agree	10	50	28	65
Neutral	64	47	56	34
Disagree	26	3	17	1
Chi-square test	P<0.05		P<0.05	
Overall sexual attitude				
Strongly restrictive	0	8	0	13
Restrictive	10	20	11	26
Moderate	16	34	50	41
Liberal	31	29	28	18
Strongly liberal	43	9	11	2
Chi-square test	P<0.05		P<0.05	

P<0.05 is statistically significant
n.s is statistically not significant

Table 10: Logistic regression analysis of the occurrence of premarital sexual intercourse (Female cases)

Predictors variables	Undstandardized (B)	Significant P<0.05	Odd ratio	95% Confidence Interval (lower-upper
Western lifestyle	2.639	0.017 *	14.005	1.610-121.831
Very western lifestyle	2.014	0.081	7.491	0.783-71.683
Neutral attitude to premarital sex	1.228	0.05	3.415	0.976-11.943
Agree to premarital sex	3.488	0.002*	32.726	3.650 -292.971

Table 11: Logistic regression analysis of the occurrence of premarital sexual intercourse (Male cases)

Predictors variables	Undstandardized (B)	Significant P<0.05	Odd ratio	95% Confidence Interval (lower-upper
Moderate religiosity	0.995	0.026	2.704	1.125-6.496
Low self-esteem	-1.564	0.011	0.209	0.063-0.698
High level of social activity	3.675	0.000	39.468	11.567-134.667
High level of social activity	1.603	0.005	4.967	1.615-15.275
Neutral to premarital sexual intercourse	1.617	0.003	5.037	1.733-14.639
Agree to premarital sexual intercourse	3.246	0.000	25.690	5.478-120.471

Risk behavior among Injecting Drug Users (IDUs) in Thanh Hoa province, Vietnam

Vo Hai Son

Abstract

This study examined the effects of an HIV/AIDS prevention program on IDU's risk behaviors in Thanh Hoa province, Vietnam. Data used was a cross-sectional survey of 414 male IDUs conducted by the Vietnam HIV/AIDS prevention project.

A logistic regression assessed the effect of the program on risk behaviors of IDUs by controlling their demographic, sexuality, drug use characteristics, and HIV/AIDS knowledge.

Findings showed that IDUs accessed the program were 52 to 64% less likely to share needles compared to those who did not ($p<0.05$). IDUs receiving free condoms were 12.3 times more likely to use them with their wives or girlfriends, and 3.4 times more likely to use them consistently with sex workers or non-regular partners compared with those who did not receive ($p<0.05$).

The program reduced IDU's HIV risk behaviors and thus the program should increase accessibility to condoms, clean syringes and needle to strengthen the effect of intervention.

Introduction

The first case of HIV infection in Vietnam was reported in 1990 in Ho Chi Minh City. During 1991-1992 and in the first half of 1993, only 11 additional cases of HIV infection were reported. However, in the second half of 1993 more than 1,100 additional cases of HIV infection were reported in provinces in the Southern Region and in the Southern part of the Central Region in Vietnam. By 1998, HIV infection had been reported in all 61 provinces of the country (MOH, 2000). As of 31th December 2008, a cumulative total of 179,735 people had been reported as HIV positive, in which 71,119 people were diagnosed with AIDS, of whom 41,544 had died (MOH, 2009). However, the actual number of infections are much higher than the recorded number, with an estimated 295,000 people living with HIV/AIDS in 2008 and about 315,000 in 2010 (MOH & FHI, 2005). The HIV epidemic in Vietnam is classified as being concentrated with high prevalence among high risk populations, mainly injecting drug users (IDUs), followed by female sex workers (FSWs), and a low prevalence among the general population. IDUs have accounted for most (75%) of the reported infection (MOH, 2009). Also, according to a 1994-2007 sentinel surveillance HIV prevalence of IDUs increased from 6% in 1996 to approximately 30% in 2005 (MOH, 2007). At the same time HIV prevalence among the general

population (pregnant and military recruits), HIV prevalence remained relatively low, less than 1% in all places surveyed in Vietnam (MOH, 2007). Findings from different research in Vietnam demonstrat that IDUs who have high levels of risk such as multiple sexual partners, unprotected sexual intercourse, and sharing of needles and syringes are more likely to infect HIV(Go et al., 2006; Quan et al., 2009; Thanh et al., 2008) .

Behavioral interventions such as needles and syringes exchange, condom distribution, and behavior change communication for IDUs have been shown to be successful in reducing their HIV risk behavior. Many studies have been conducted to evaluate preventive interventions aimed at reducing sexual risk and sharing of needles and syringes among IDUs. A meta-analytic review of sharing needles among IDUs in United States showed that such interventions were highly effective in reducing unsafe drug injection (Ksobiech, 2003). In addition, a meta-analytic review of 12 controlled trails among IDUs in United States indicated that HIV/AIDS prevention interventions were highly effectively in reducing unprotected sex and unsafe drug injection among IDUs, but effects of interventions on needle sharing were non-significant (Crepaz et al., 2006). A recent research of behavioral interventions for IDUs in Vietnam also found that these interventions were effective in reducing risk behaviors (Huong, 2008; Thanh et al., 2008).

In order to control the HIV epidemic, the Vietnam government promulgated the national strategy on HIV/AIDS prevention and control in 2005-2010, and vision until 2020, in which the harm reduction interventions for high risk population were one of the important action plans to control HIV transmission in Vietnam (Government, 2004). At the 2006 national conference for this program it was declared that harm reduction interventions were a top priority for preventing the spread of HIV. Harm reduction accounted for almost one-fifth (20%) of total funds available to intervene for IDUs and FSWs (MOH, 2006). The aim of this paper is to examine the effect of HIV/AIDS prevention program on HIV risk behaviors among IDUs in Thanh Hoa provinces, Vietnam.

Research Methods

Background of HIV/AIDS prevention project

Thanh Hoa is one of 20 provinces involved in the Vietnam HIV/AIDS Prevention Project (VNHPP) funded by the World Bank for five years (2006-2011). Since 2006, under the VNHPP project, Thanh Hoa has focused on three main components namely [i] Exchanging needles and syringes [ii] Distributing condoms and [iii] Counseling for behavior change on the basis of setting up collaborators, and peer- educators' network and health workers in the province. Its main objectives are to increase the percentage of IDUs with safe injecting practices, for them to take part in harm reduction activities run by peer-educators, to increase the percentage of FSWs using condoms, and to ensure availability of needles and condoms used in the harm reduction program in the whole province.

Data Collection

A cross sectional survey was carried out among IDUs from four project districts: Quang Xuong, Quan Hoa, Tinh Gia and Dong Son in Thanh Hoa. Participants in this survey were selected by a snowball sampling method among IDUs who had been introduced by pear educators through distributing a coupon. Those eligible were 15 years of age or older, residents of the study area, and injecting drugs in the six months prior to the conducted survey. The local health care workers in charge of the HIV program at commune health centers made contact to invite them to participate in the study.

Data were collected June to September of 2008 by trained field teams from the provincial center for HIV/AIDS control, and these were supervised by a national advisory team from the Vietnam Administration of HIV/AIDS Control. Using a specially designed questionnaire, the teams collected information on socioeconomic and demographic characteristics; HIV counseling; drug use and sexual behaviors. The interview process was by consent and anonymous. No names or other identifying information was collected and all information provided by participants was kept confidential.

Data Analysis

We performed a logistic regression analyze to derive crude estimates of association between predictors and outcomes. The outcome variables were condom use with regular partners during sexual intercourse in the previous month, use of condoms consistently with female sex workers (FSWs) or non-regular partner during the previous 12 months, and the sharing of needles and syringe with drug use partners in the previous month. Using condoms consistently with FSWs or non-regular partners was defined as always use condoms in all sexual intercourse with FSWs or non-regular partners in the previous 12 months. Needle and syringe-sharing behaviors were defined as either borrowing needles/syringes from drug user partners or handing to them during the last month.

A multivariate logistic regression was used to examine the associations of independent variables with the outcomes. The odd ratios (ORs) and significant value (P) were calculated to estimate and measure the association. Variables were selected for the multivariate model on the basis of prior knowledge about the relationship between them and the outcome, the magnitude of the odd ratios in univariate analysis and specific research interests.

Results

Socio-demographic characteristics of participants

Of the 414 participants, average age was 29.1 years (ranged from 16 to 61, standard variation 7.4). The majority of them (49.6%) were 25-34 years old, 31.1% were under 25 years old and 21% of them were over 35 years old. Most of them completed secondary school (49.4%) or higher level (35.0%). Only 2.2% of them never had schooling and 19.6% of them completed primary school. Almost a half of participants were single (40.6%), 2.7% of them were divorced or separated, and 56.8% were married. The Kinh accounted for the majority of participants (69.8%); the Kinh is the majority ethnic group in Vietnam, constituting 87% of the total population (2003 national census). Other groups (Thai and Muong) were 30.2%. In term of mobile status, almost one-third (27.6%) of participants reported that they had ever been to other provinces for more than one months during the previous 12 months at the survey.

Drug use behavior

The mean duration of drug injection of the participants was 5 years (standard variation 3.6, range 1-51 years), more than half (55.6%) of participants had a history of drug injection of 4 years or longer, and 44.2% of them had used drugs for less than 4 years. Almost a half (46.6 %) of participants injected drugs twice or more per day. Regarding to drug injecting sharing behavior, 15% of participants reported sharing needles and syringes in the last month (Table 1)

Table 1: Drug using characteristics of participants (N=414)

Characteristics	Frequency	Percentage	Descriptive Statistics
Duration of drug injection			
< 4 years	183	44.2	Mean: 5; SD: 3.6
≥ 4 years	230	55.6	Median: 4
			Max: 51; Min: 1
Frequency of drug injecting use during last month			
< 1 time per day	101	24.4	
1 time per day	118	28.5	
≥ 2 times per day	193	46.6	
Sharing needles and syringes during last month			
Yes	62	15.0	
No	351	85.0	

Total may not add up to 100% for some variables because of missing values

Sexual behaviors

About 40% of participant reported to have sex with FSWs or non-regular partners during the 12 months prior to the survey. The majority of participants (81.8%) who had

sex with FSWs or non-regular partners during the previous 12 months reported to use condoms consistently. Regarding to IDUs who had sex with their wives or girlfriends in the last month, 46.5% of them reported using a condom the last time they had sex. (Table 2)

Table 2: Sexual behavior characteristics of participants (N=414)

Characteristics	Frequency	Percentage
Have sex with FSWs or non-regular partner during the last 12 months		
Yes	165	39.9
No	249	60.1
Use condom consistently with FSW or non-regular partner during the last 12 months		
Yes	135	81.8
No	30	18.2
Use condom with wives or girlfriends at the last sex intercourse		
Yes	145	46.5
No	167	53.5

Knowledge on HIV/AIDS and HIV test

The mean score of HIV/AIDS knowledge of participants was 8.9 (SD: 2.2). 67.9% of them answered correctly 9 or more out of 11 questions about HIV prevention and rejected misconceptions of HIV transmission. These IDUs was measured as have good HIV/AIDS knowledge. Relating to HIV test, 30.9% of participants reported ever having a HIV test in their life. About 31% of IDUs in this study had a HIV test before the survey.

Table 3: Characteristics on knowledge about HIV/AIDS and HIV test

Characteristics	Frequency	Percentage	Descriptive Statistic
Knowledge about HIV/AIDS			Mean score: 8.9
Good	281	67.9	Median: 10; SD: 2.2
Poor	133	32.1	Max: 11; Min: 0
Ever had HIV test			
Yes	127	30.9	
No	295	69.1	

Accessed the HIV prevention intervention program

Table 5 highlights that about 75% of IDUs received counseling on HIV/AIDS from health workers. In addition, most of the IDUs received needles and syringes from a program during the last 6 months (87%), while only 56% received condoms from a program during the same period. These figures were much higher than that of Global Fund project in 20 provinces of Vietnam, 16.4% and 41.1% respectively (Thanh et al., 2008).

Table 5: Frequency of IDUs by accessed the program (N=414)

Characteristics	Frequency	Percentage
Received a counseling on HIV/AIDS from health workers		
Yes	309	74.6
No	103	24.9
Received needles and syringes from program during the last 6 months		
Yes	359	87.1
No	53	12.9
Received condom from program during last 6 months		
Yes	231	55.8
No	181	43.7

Total may not add up to 100% for some variables because of missing values

Determinants of needles and syringes sharing behaviors

In the multivariate logistic regression on sharing needles and syringes, results show that the mobile status of IDUs has a significantly increased probability of sharing needles and syringes (OR=2.4, 95% CI 1.3-4.5). Surprisingly, IDUs who have a good knowledge of HIV/AIDS are more likely to share needles and syringes than those who have poor knowledge of HIV/AIDS (OR=2.4, 95% CI 1.2-5.0). However, having a HIV test had a positive effect on reducing the sharing of needles and syringes among IDUs (OR =0.4, 95% CI 1.2-5.0). Both receiving a counseling, and free needle/syringe had a positive effect on reducing the unsafe injecting behavior (OR= 0.36 95%CI 0.2-07; and OR=0.48, 95% CI 0.2-0.9 respectively) (Table 6).

Table 6: Logistic regression analysis of factor for sharing of needles and syringes during the last months among IDUs

Factors	N	%	Odd Ratio	95% CI
Age				
< 25	113	*21.8*	1	
25 -34	193	*12.4*	0.58	0.2-1.6
≥35	87	*10.3*	0.84	0.2-4.4

Table 6: Logistic regression analysis of factor for sharing of needles and syringes during the last months among IDUs *(Continued)*

Factors	N	%	Odd Ratio	95% CI
Education				
Primary school or lower	90	*13.3*	1	
Secondary school	175	*18.3*	1.19	0.5-2.8
High school or higher	145	*12.4*	0.76	0.3-2.0
Marital status				
Not married	179	*18.4*	1	
Current married	234	*12.4*	1.25	0.6-2.8
Ethnic groups				
Kinh	288	*15.6*	1	
Thai or Muong	125	*13.6*	1.19	0.6-2.5
Mobile status				
No	296	*12.2*	1	
Yes	113	*77.0*	**2.41***	1.3-4.5
Duration of drug injection				
< 4 years	182	*19.8*	1	
≥ 4 years	230	*11.3*	0.85	0.4-1.6
Frequency of drug injecting use in the last month				
< 1 time per day	101	*12.9*	1	
1 time per day	118	*16.1*	1.64	0.7-4.0
≥ 2 times per day	193	*15.0*	1.41	0.6-3.3
Sexual intercourse with FSWs or non-regular partner during the last 12 months				
No	248	*12.5*	1	
Yes	165	*18.8*	1.6	0.8-3.1
Knowledge about HIV/AIDS				
Poor	132	*9.8*	1	
Good	281	*17.4*	**2.4***	1.2-5.0
Ever had HIV test				
No	284	*18.0*	1	
Yes	126	*7.9*	**0.41***	0.2-0.9
Received a counseling on HIV/AIDS from health workers during the previous 6 months				
No	103	*28.2*	1	
Yes	308	*10.4*	**0.36***	0.2-0.7
Received needles and syringes from program during last 6 months				
No	52	*21.2*	1	0.2-0.7
Yes	359	*13.9*	**0.48***	0.2-0.9

*N: 399, LR chi-square: 47.1, Sig. <0.01, Pseudo R: 0.14, * Sig. level of 0.05*

Determinants of sexual behaviors

The result of the multivariate regression analysis shows that getting married or having sex with FSWs or non-regular partners during the previous 12 months among IDUs was significant associated with reducing condom use with wives or girlfriends in the last sex intercourse in the last months. Furthermore, receiving counseling from health workers also had a negative effect on condom use with their wives or girlfriends. However, receiving free condoms from the program during the previous 6 months increased probability of use condoms with wives or girlfriends the last time they had sex in the last month (OR 12.3, 95% CI 6.3-23.9) (Table 7).

Table 7: Logistic regression analysis of factor for using condom with wives of girlfriends in the last sex intercourse in the previous months

Factors	**N**	**%**	**Odd Ratio**	**95% CI**
Age				
< 25	78	*53.8*	1	
25 -34	153	*44.4*	1.08	0.5-2.5
≥35	81	*43.2*	1.56	0.6-4.3
Education				
Primary school or lower	72	*18.6*	1	
Secondary school	138	*44.2*	0.72	0.4-1.5
High school or higher	99	*49.5*	0.76	0.3-1.7
Marital status				
Not married	81	*61.7*	1	
Current married	231	*41.1*	**0.36***	0.2-0.9
Ethnic groups				
Kinh	213	*41.3*	1	
Thai or Muong	99	*57.6*	0.64	0.3-1.3
Mobile status				
No	299	*47.2*	1	
Yes	80	*45.0*	0.90	0.5-1.6
Sharing needles and syringes during last month				
No	263	*47.5*	1	
Yes	48	*41.7*	0.64	0.3-1.4
Sexual intercourse with FSWs or non-regular partner during the last 12 months				
No	187	*50.3*	1	
Yes	125	*40.8*	**0.39****	0.2-0.7
Knowledge about HIV/AIDS				
Poor	99	*40.4*	1	
Good	213	*49.3*	1.48	0.8-2.7

Table 7: Logistic regression analysis of factor for using condom with wives of girlfriends in the last sex intercourse in the previous months *(Continued)*

Factors	N	%	Odd Ratio	95% CI
Ever had HIV test				
No	215	*42.3*	1	
Yes	95	*55.8*	**1.83†**	1.0-3.4
Received a counseling on HIV/AIDS from health workers during the previous 6 months				
No	77	*48.1*	1	
Yes	234	*45.7*	**0.44***	0.2-0.9
Received free condom from program during last 6 months				
No	39	*43.6*	1	
Yes	272	*46.7*	**12.3*****	6.3-23.9

*N: 303, LR chi-square: 96.6, Sig. <0.001, Pseudo R: 0.23, †Sig. level of 0.1 * Sig. level of 0.05*

Regarding the use of condoms consistently with FSWs or non-regular partners during the previous 12 months, the research indicates that IDUs who get married are 80% less more likely to use condom consistently with FSWs or non-regular partner than those who were single ($p<0.05$). IDUs, who are of the ethnic group Kinh, are 8.1 times more likely to use condoms consistently with FSWs or non-regular partner than other ethnic IDUs. Also, IDUs who reported to share needle and syringe were 63% less likely to use condom consistently than those who did not share needle and syringe, but significance are low level ($p<0.1$) However, receiving free condoms from the HIV/AIDS prevention program increased the probability of using condoms consistently with FSWs or non-regular partner during the previous 12 months with OR =3.24, 95% CI 1.2-8.9. Other components of the program were not showed in this data (Table 8).

Table 8: Logistic regression analysis of factor for using condom consistently with FSWs or non-regular partner in the previous 12 months

Factors	N	%	Odd Ratio	95% CI
Age				
< 25	59	*79.7*	1	
25 -34	78	*84.6*	1.74	0.4-7.3
≥35	28	*78.6*	1.73	0.3-10.0
Education				
Primary school or lower	25	*28.0*	1	
Secondary school	70	*77.1*	1.17	0.3-4.8
High school or higher	67	*89.6*	3.74	0.8-15.9

Table 8: Logistic regression analysis of factor for using condom consistently with FSWs or non-regular partner in the previous 12 months *(Continued)*

Factors	N	%	Odd Ratio	95% CI
Marital status				
Not married	85	*88.2*	1	
Current married	80	*75.0*	**0.20***	0.1-0.8
Ethnic groups				
Thai or Muong	25	*56.0*	1	
Kinh	140	*86.4*	**8.1****	2.1-30.8
Mobile status				
No	107	*83.2*	1	
Yes	57	*78.9*	0.95	0.3-2.6
Sharing needles and syringes during last month				
No	134	*85.8*	1	
Yes	31	*64.5*	**0.37**†	0.1-1.0
Knowledge about HIV/AIDS				
Poor	54	*83.1*	1	
Good	111	*81.1*	1.09	0.4-3.1
Ever had HIV test				
No	116	*82.8*	1	
Yes	48	*81.3*	0.87	0.3-2.6
Received a counseling on HIV/AIDS from health workers during the previous 6 months				
No	44	*77.3*	1	
Yes	121	*83.5*	0.87	0.3-2.8
Received free condoms from program during last 6 months				
No	50	*72.0*	1	
Yes	115	*86.1*	**3.24***	1.2-8.9

*N: 161, LR chi-square: 34.0, Sig. <0.001, Pseudo R: 0.22, †Sig. level of 0.1 * Sig. level of 0.05*

Conclusion

The findings suggest that the risk on cross spreading of HIV between IDUs, FWSs, and their sex partners is high in Thanh Hoa province. A significant proportion (about 40%) of IDUs reported having sex with FSWs or non-regular partners during the previous 12 months, while about 20% of them reported not using condoms consistently with these sexual partners. Otherwise, the majority (74.6%) IDUs reported to receiving counseling from health workers, but only about half (45.7) of them reported using condoms with their wives or girlfriends the last time they had

sex. Correspondingly, “condom not available” and “dislike use condoms” were among the major reasons for not using condoms among IDUs. This study also found that IDUs who get married or were from an ethnic minority tended to inconsistently use condoms with their sex partners. Regarding sharing needles and syringes, this research shows that IDUs who have good knowledge of HIV/AIDS are 2.4 times more likely to share needles and syringes than those who have poor knowledge. It means that although IDUs have good knowledge on HIV/AIDS, they still did not concern the risk of HIV transmission when they craved for drugs. A high proportion (15%) of IDUs reported sharing needles and syringes during the previous month. These findings might indicate that needles and syringes are not easily obtained in the research sites. Qualitative research in Thanh Hoa indicated that IDUs were sharing needles and syringes due to a lack of money or injecting in late evenings (Ngo, Schmich, Higgs, & Fischer, 2009). The proportion (15%) sharing needles and syringes in this study is similar to results in other studies in big province/cities in Vietnam (MOH & FHI, 2006; Thanh et al., 2008). It is argued that the proportion of IDUs sharing equipment, accompanied with the high HIV prevalence rate (29%) is why the HIV epidemic in Vietnam is predominantly concentrated among IDUs. Although the spread of HIV though sharing needles and syringes is high in some countries in Asia, unsafe sexual intercourse is still the major way of HIV transmission in the world (UNAIDS, 2008). This research also showed that IDUs who reported to having sex with FWS during the last 12 months were less likely to use condoms with their wives or girlfriend, in addition, those who reported sharing needle and syringe were less likely to use condom consistently with FSWs or non-regular partners.

As many international reports indicate, exchanging needles and syringes as well as distributing free condoms are the best solutions for preventing the spread of HIV, given the lack of a cure ("Asia needs political commitment to fight AIDS," 1997; UN, 2004; UNAIDS, 2008). Many studies also demonstrate that HIV/AIDS prevention programs can reduce HIV risk behaviors among IDUs (Ksobiech, 2003; Thanh et al., 2008), In addition, a meta-analytic review of 12 controlled trails among IDUs indicated that HIV/AIDS prevention interventions were highly effectively in reducing unprotected sex and unsafe drug injection among IDUs, but effects of interventions on needle sharing were non-significant (Crepaz et al., 2006). Our finds also show that IDUs who received free needles and syringes are less likely to share their drug taking instruments than those who did not receive needles and syringes. Also, those who received free condoms are more likely to use them with their wives and girlfriends, and are more likely to consistently use condoms with FSWs or non-regular partners than those who did not receive free condoms. Providing counseling from health workers also increased the safe injecting practices among IDUs, however, using condoms were not influenced by counseling for both with regular sex partners and non-regular partners in this research.

This study has several limitations and possible biases. IDUs are a hidden population and difficultly access. Sampling for the study was based on the peer educator network and thus may not be a representative sample of IDUs.

Recommendations

It is recommended that other HIV intervention programs ensure that IDUs have access to condoms, and clean syringes and needles. In addition, the program should strengthen capacity building for health workers, peer educators on counseling skills to make sure that all of IDUs who receive counseling will practice safe risk behaviors. To prevent the spread of HIV from high-risk populations to general population, the program should further strengthen behavior change communication activities for IDUs and their families, especially for married IDUs of ethnic minority groups.

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Sexual and reproductive health knowledge differential among unmarried adolescents in project and non-project sites of Family Planning Association of Bangladesh

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Abstract

This study examines the sexual reproductive health (SRH) knowledge differential of unmarried adolescents in project and non-project sites run by the Family Planning Association of Bangladesh (FPAB). Secondary data from the "Reproductive Health and Family Life Education for Youth" project, implemented by the FPAB from the early 1980s until now to increase adolescents' sexual and reproductive health knowledge, was used.

The sample included 601 adolescents in project sites and 199 in non-project sites. Results from a multinomial logit regression reveal that adolescents in project sites had better knowledge than those in non-project sites although the difference was not pronounced. Additionally, adolescents' knowledge in both sites is significantly affected by their sex, education, and place of residence. Therefore, this study suggests that appropriate BCC (Behavior Change Communication) materials with peer educators can be added to the existing project to increase adolescent knowledge and protect them from STIs including HIV/AIDS.

Background

In Bangladesh, there are 36 million adolescents between the ages of 10 and 19, representing 28% of the population of 153 million (BBS, 2008). Many of these adolescents have limited access to sexual SRH knowledge, poor knowledge and misconceptions about SRH issues. Knowledge of STI/HIV/AIDS among males and females was found to be 36% and 31%, respectively (Young Power Social Action, 2008). Adolescents have huge misperceptions, 84% believe that wet dreams are harmful, 14% believe it is a disease, 28% said it is sinful and 75% students felt that masturbation is a harmful habit (Imtiaz, 2008). In addition, unmarried female adolescents have highly superstitious beliefs about food restrictions during menstruation (Larson et. al., 2005).

The cultural and religious norms and practices of Bangladesh do not allow adolescents to discuss SRH issues. In a recent survey, about 95% could not talk about SRH openly while 70% shared their experiences with 'intimate' friends and classmates only (Bhuiya et al., 2004).

A recent survey in 2007 completed by the Population Council, shows that over 40% and 20% of urban and rural males, respectively, were sexually active before the

age of 19 (Price, 2007). Also, the risk among adolescents for HIV/AIDS is reflected in data of the national HIV surveillance, which reports that 55% of patients with STIs identified were less than 20 years old. Another recent adolescent SRH knowledge surveys, conducted by Population Council, 'What is known' is often incorrect and derived through communication with friends who are equally less knowledgeable. At the same time most parents and community members do not feel that adolescents need SRH knowledge to protect themselves from the vulnerability of STI/HIV/AIDS (Jahangir et al., 2001).

The school curriculum does not contain courses on sex education in Bangladesh. The absence of SRH education in the education curriculum and the existing service delivery system is not catering to the needs of adolescents, especially unmarried adolescents (Bhuiya et al, 2004). Additionally, concerns and fears of adolescents about SRH knowledge issues exit among unmarried adolescent (Nahar et al, 1999).

Since the beginning of the adolescent SRH knowledge program in Bangladesh, both government and non-government organizations in different sectors have had to face sociocultural and programmatic obstacles. In addition, a 2008 survey conducted by BCCP, found that the level of adolescent SRH knowledge status was "unsatisfactory" by the government of Bangladesh both in terms of program efforts and achievements in addressing SRH needs.

In addition, inadequate programmatic efforts from both public and private sectors are a significant obstacle to meet the growing unmet need for adolescents' knowledge. There is a lack of skilled workers; those who are treating adolescents tend to do so poorly as they cannot provide correct knowledge, or in a passionate and confidential way. The challenge of promoting adolescent SRH knowledge is the gap between the "strategies and implementation" is caused by programmatic obstacles.

The Family Planning Association of Bangladesh (FPAB) implemented the "Reproductive Health and Family Life Education for Youth" project in 71 project sites around the country. The main purpose of the project was to raise awareness and change attitudes on SRH and enabling adolescents to seek information and care. Different forms of IEC (Information Education and Communication) materials were used to build up adolescents' awareness during the project instance.

A needs assessment was conducted in both FPAB project and non-project sites in 2000 to identify the SRH needs, appropriate means and ways to address SRH needs of adolescents and youth and to assess IEC materials. This study, therefore, aims to determine sexual and reproductive health knowledge differentials among unmarried adolescents in project & non-project sites of Family Planning Association of Bangladesh.

Data and methods

The "Reproductive Health and Family Life Education for Youth" survey was conducted by FPAB. A total 800 adolescents were interviewed, 601 in project and 199 in non-project sties. A multinomial logistic regression was applied to examine the differential of SRH knowledge among respondents in the different sites. In order to determine whether SRH knowledge has any association with sociodemographic characteristics the following facts - sex, age, education, occupation, place of residence, and religion - were included as potential confounding factors.

There are some limitations with the survey. For instance, an important question on the project sites such as source of SRH knowledge is not available in the data. Beside of this, there is no enough information related to sociodemographic characteristics of the respondents that helps to know the social effect on SRH knowledge.

Results

Table 1 show that the distribution of sex and age among respondents in project and non-project sites are similar. About three-fourths of the respondents are adolescents aged 15-19 years and the rests are aged 10-14 years. Respondents in non-project were better educated, with 81% of them completing secondary education, compared to 69% in the project sites. In both sites the proportions of respondents who have finished higher secondary education were quite low.

Moreover, 76% of the respondents in non-project sites and 65% in project sites were students, whereas less than 10% of respondents in both sites were involved in cultivation including agricultural labor. The rest of the respondents in both sites were engaged in other occupations, such as small business, service, rickshaw puller, day labor and technical workers.

Table 1 : Socio-demographic characteristics of respondents

Socio demographic characteristics	Project sites N=601		Non-project sites N=199	
	Percent	Number	Percent	Number
Sex				
Male	49.9	300	50.3	100
Female	50.1	301	49.7	99
Age level				
10-14	27.8	167	27.1	54
15-19	72.2	434	72.9	145

Table 1: Socio-demographic characteristics of respondents *(Continued)*

Socio demographic characteristics	Project sites N=601		Non-project sites N=199	
	Percent	**Number**	**Percent**	**Number**
Education				
Primary	24.1	145	15.6	31
Secondary	69.1	415	80.9	161
Higher secondary	6.8	41	3.5	7
Occupation				
Others	26.0	156	15.1	30
Cultivation	8.3	50	9.0	18
Student	65.7	395	75.9	151
Place of residence				
Rural	66.6	400	52.6	104
Urban	33.4	201	47.4	48
Religion				
Hindu	9.0	54	36.7	73
Muslim	91.0	545	63.3	126

Concerning the place of residence, in project sites the majority of respondents (67%) lived in rural areas, while in non-project sites slightly more than half of respondents (53%) lived in rural areas. As expected, since Bangladesh is a Muslim country, the proportions of Muslims are 91% in both types of sites.

Sexual and reproductive health knowledge

Both male and female respondents had a good understanding females should take care of their reproductive health. This was the case in both types of sites. However, all respondents had a poor understanding of the female reproductive age.

Regarding the question of mental changes during puberty, female respondents appeared to have better knowledge than male respondents in both sites. For physical changes during puberty, male respondents in non-project sites appeared to have better knowledge than female respondents, while in project sites it was the females who had better knowledge. Concerning the question of why menstruation occurs; female respondents in the non-project sites had better knowledge than females in project sites. The female respondents in project sites appeared to have better knowledge than in non-project sites when asked the consequence of not maintaining personal hygiene during menstruation.

Table 2: Percentage distribution of correct answer on SRH knowledge

Specific question about SRH knowledge	Project sites		Non-project sites	
	Male %	Female %	Male %	Female %
When women reproductive age starts?	7.3	4.3	3.2	4.3
When women reproductive age ends?	1.3	15.6	0.2	3.8
Whether women should take care through out life for her reproductive health?	98.7	98.3	96.1	99.2
What types of mental changes occur during puberty?*	23.3	41	23.1	36.1
What types of physical changes occur during puberty?*	54.2	57	50.4	37.7
Why Menstruation occurs?	-	22.9	-	38
What a women should do to maintain hygiene during menstruation?*	-	63	-	63.3
What are the consequences of not maintaining personal hygiene during menstruation?*	-	39	-	29.5

* The question has 3 possible responses.

The level of SRH knowledge among adolescents in this study was divided into three levels. That is, if the respondents could correctly answer more than 80% of all questions their knowledge were considered as high, between 50 to 80% as medium, the rest were regarded as having low level knowledge.

Both in the project and non-project sites the majority of respondents had high or medium knowledge. In project sites the proportion of respondents who had medium and high knowledge level was 74%, higher than the 65% in non-project sites. 70% of the male respondents in project sites could correctly answer more than half of the questions whereas only 57% of the males in non-project sites. Female respondents in project sites also had better knowledge than females in non-project sites (79% vs. 74%). In project sites 35% of respondents aged 15-19 had high knowledge level while 32% of respondents aged 10-14 had such a knowledge level. Moreover, 88% of the respondents in the project sites with higher secondary education had medium or high knowledge level. In the non-project sites none of the respondents' knowledge was low if they had higher secondary education. On the other hand, in project sites the proportion of respondents having medium or high knowledge gradually increased as their educational level increasing from primary to higher secondary; this tendency was not same in non-project sites.

Students both in project (37%) and non-project sites (29%) sites had better knowledge than any other occupation. Respondents in the project sites involved in cultivation had better knowledge level compared with those of other occupations. Urban respondents in project sites had better knowledge compared with respondents

in non-project sites urban areas (43% vs. 28%). Rural respondents in project sites also had better knowledge compared with rural respondents in non-project sites (30% vs. 22%). In terms of religion, in project sites both Hindu and Muslim respondents had better knowledge than those with the same religions in non-project sites. In addition, the Hindu respondents in the project sites appeared to have better knowledge level than those in non-project sites (35% vs. 27%). Similarly, Muslim respondents in project sites also had better knowledge level than those in non-project sites (35% vs. 28%).

Table 3: SRH knowledge by sociodemographic characteristics

Characteristics	Project sites			Non-project sites		
	N=601			N=199		
	Low	Medium	High	Low	Medium	High
Total	25.6	39.9	34.4	34.7	37.7	27.6
Sex						
Male	30.3	30.0	39.7	43.0	22.0	35.0
Female	20.9	49.8	29.2	26.3	53.5	20.2
Age level						
10-14	28.1	40.1	31.7	27.8	31.5	40.7
15-19	24.7	39.9	35.5	37.2	40.0	22.8
Education						
Primary	41.4	36.6	22.1	58.0	16..0	26.0
Secondary	21.4	41.0	37.6	32.0	40.0	29.0
Higher secondary	12.2	41.5	46.3	0.0	86.0	14.0
Occupation						
Others	30.8	42.3	26.9	53.3	20.0	26.7
Cultivation	42.0	22.0	36.0	55.6	22.2	22.2
Student	21.5	41.3	37.2	28.5	43.0	28.5
Place of residence						
Rural	23.8	46.0	30.3	39.6	37.2	22.2
Urban	29.4	27.9	42.8	34.7	37.7	27.6
Religion						
Hindu	20.4	44.4	35.2	28.8	43.8	27.4
Muslim	26.1	39.4	34.5	38.1	34.1	27.8

Sexual and reproductive health knowledge differentials

In this study a multinomial logit regression analysis was applied to examine the net differentials of SRH knowledge between project and non-project sites. The model of parameter estimating SRH knowledge is significant at the level of 0.001. All of these determinant variables together explain the variation in the knowledge status of individuals by 14% (*Pseudo R^2*). In addition, among the seven explanatory variables used, four had a significant effect on the response variable. In this analysis, low level of knowledge is regarded as the reference level. Most of all, project sites had a significant positive relationship with SRH knowledge ($p < 0.01$). Especially, project sites played a significant role in differentiating the high knowledge level from the low knowledge (reference) level. That is, respondents in project sites had higher knowledge compared with respondents in non-project sites. However, project sites do not differentiate the medium knowledge level from the low knowledge level.

Regarding sex of respondents, there is a significant relationship between sex and their SRH knowledge. Particularly, sex plays a significant role in differentiating the medium knowledge level from the low knowledge. That is, male respondents had significant less knowledge than female respondents. However, sex did not differentiate the high knowledge from the low knowledge ($p > 0.5$).

Table 4: Parameter estimates for medium and high SRH knowledge
Probability > chi2 = 0.0000
Pseudo R2 = 0.1399
Log likelihood = 229.3840

	Medium knowledge		High knowledge	
	Coefficient	Standard Error	Coefficient	Standard Error
Sex* **				
Male	-1.117***	0.201	-0.073	0.206
Female (RC)	-	-	-	-
Age level				
10-14	-0.193	0.221	0.223	0.224
15-19 (RC)	-	-	-	-
Education* **				
Primary	-1.943***	0.577	-2.068***	0.580
Secondary	-1.094	0.522	-1.002	0.520
Higher secondary (RC)	-	-	-	-
Occupation				
Others	-0.024	0.264	-0.080	0.272
Cultivation	-0.528	0.377	-0.255	0.343
Student (RC)	-	-	-	-

Table 4: Parameter estimates for medium and high SRH knowledge *(Continued)*

	Medium knowledge		High knowledge	
	Coefficient	Standard Error	Coefficient	Standard Error
Place of residence* **				
Rural	0.746**	0.236	-0.151	0.226
Urban (RC)	-	-	-	-
Religion				
Hindu	0.321	0.270	0.210	0.282
Muslim (RC)	-	-	-	-
Programmatic factors**				
Project sites	0.016	0.278	0.779**	0.270
Non-project sites (RC)				

NB: The reference category is low level of knowledge

*** - significant at the 0.001 level
** - significant at the 0.01 level
* - significant at the 0.05 level

In terms of education of respondents, there is a significant relationship between education and their knowledge. The primary level of education had a significantly negative effect in distinguishing both medium and high knowledge level from low knowledge. That is, respondents with primary education had the worst status of SRH knowledge compared with those respondents who had secondary or higher secondary education.

Moreover, place of residence was also significantly related with SRH knowledge ($p < 0.001$). Living in rural areas plays a significantly negative role in differentiating the medium knowledge level from the low knowledge level ($p < 0.01$). Whereas, place of residence does not differentiate the high knowledge level from the low knowledge.

Last but not least, respondents' age, occupation, and religion have no statistically significant relationship with the knowledge of SRH.

Predicted probability of SRH knowledge

Table 5 shows the predicted probability of each given value of the independent variables which are significantly associated with respondents' SRH knowledge. The sum of the probabilities of all the categories within one variable should be equal to 1. The overall mean suggest that from the three choices of knowledge, medium knowledge had more probability to be selected followed by high and then low knowledge. Both male and female adolescents in project sites had more probability of

high knowledge than those in non-project sites. But female respondents in both sites have more chance to have medium SRH knowledge.

Concerning education, in project sites the higher the education of the respondents the greater probability that they would have better SRH knowledge. However, in non-project sites this is not the case. Respondents with higher secondary education have the highest probability of having medium knowledge in non-project sites. In project sites urban respondents had a higher probability of having a high SRH knowledge compared to rural respondents (43% vs. 30%), whereas in non-project sites the probability of having knowledge was the same among for all the respondents.

Table 5: Predicted Probability of sexual and reproductive health knowledge

Socio demographic Characteristics	Probability of having knowledge		
	Low	**Medium**	**High**
Programmatic factor**			
Project sites	0.26	0.40	0.35
Non-project sites	0.34	0.39	0.28
Sex***			
Male	0.32	0.29	0.39
Female	0.20	0.51	0.30
Education***			
Primary	0.41	0.35	0.24
Secondary	0.22	0.41	0.37
Higher secondary	0.10	0.42	0.48
Place of residence**			
Rural	0.24	0.46	0.30
Urban	0.29	0.28	0.43

The results of the predicted probability through the multinomial logit regression analysis indicates that the adolescent respondents' SRH knowledge status were influenced by their sociodemographic characteristics, namely, sex, education level, and place of residence, although the levels of effect were different.

Discussion

In this study, female adolescents have better knowledge than male adolescents in both project and non-project sites, which is consistent with one study in United States, where females were found to have higher STI and SRH knowledge than males (Oliveira, 2002). This is mostly likely due to to the question design because in this study most of the questions on SRH are about females. It was found in both sites that education had a significant relationship with knowledge. This finding matches various

studies which have showed that education itself can empower adolescents to acquire SRH knowledge (NFHS, 1996; BDHS, 2004; Khan, 2002; Im-em et al., 2002 and Chen et al., 2003). Particularly, in the project sites, the higher the educational level of respondents the greater probability of respondents having better knowledge. This may due to the fact that higher education makes adolescents understand the message correctly and efficiently. Some other studies conducted among adolescents in Bangladesh also found that higher educated respondents had better SRH knowledge (Huq et al., 2005, pp: 28; Bhuiya et al., 2004). Among all the respondents, students appear to have better knowledge in both sites although the relationship between occupation and knowledge is not significant. This differential between students and other occupations could be caused because students have more access to knowledge compared with others respondents in both rural and urban areas (Haseen, 2007).

Concerning place of residence in project sites, living in urban areas had a significantly positive relationship with knowledge. That is, in project sites urban adolescents had better knowledge than rural adolescents. This finding is consistent with studies in China (Manchester, Hardee, Qi, Yuan and Zhengu, 2004) and Bangladesh (BDHS, 2004). The differential between project and non-project sites could be explained as the effect of the project. On the other hand, it was found that in project sites the probability of having high knowledge among urban respondents increased by 15% whereas the probability of having high knowledge among rural respondents only increased 2%. Perhaps this is because urban respondents in Bangladesh have higher education levels, better receptivity, and easier access to information.

In this study, Muslim respondents appear to have less knowledge than Hindu respondents in both sites. This could be because in Bangladesh Islam is stricter than Hinduism. The finding is in agreement with the results of studies carried out in Ghana (Kofi, Asare, Albert and Akwasi, 2004), in Kuwait (Dia , et al, 2005), and in India (Nair, 2004) which showed that the people whose religion had stricter rules about sex are less likely to have SRH knowledge than those whose religion is not as restrictive about sex.

Conclusion and recommendations

The study found that in project sites the proportion of respondents having medium and high level of SRH knowledge was 74% whereas it was 65 % in non-project sites. Results of the multinomial logit regression indicated that being in project and non-project sites the level of SRH knowledge was significantly related with adolescents' sex, education and place of residence.

From the analysis and predicted probability of each factor of knowledge, it is found that female respondents have a higher probability of having better knowledge than male respondents in both sites. Concerning education, in project sites, the education level of respondents is higher. As well, in project sites urban respondents have better knowledge than rural respondents. While in non-project sites there is no

significant differential of knowledge between urban and rural adolescents. In addition, adolescents who are younger, students, and those who are Hindus appear to have better knowledge than those adolescents who are older, non-students, and believe in Islam. However, in this study there are no significant relationship found between age, occupation, religion and knowledge.

Urban adolescents are likely to have better SRH knowledge than rural adolescents in this study. It was also found that the probability of having high SRH knowledge among urban adolescents increased more compared for rural adolescents. Therefore, SRH promotion program should pay more attention to rural adolescents. Hence, this study suggests that appropriate BCC materials for peer educators can be added to the existing project to increase adolescent knowledge and protect them from STIs including HIV/AIDS.

From this study it was found that in non-project sites the probability of having high SRH knowledge among adolescents did not increase with the rise of education level, which is not consistent with previous studies. Thus, future research could be conducted to study the underlying causes. As well, female adolescents appeared to have better SRH knowledge than male adolescents in both sites, which is also not in agreement with many studies. Therefore, more scientific and systematic research is needed to test and verify the differential of sexual and reproductive health knowledge by sex.

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The Relationship between Obesity and Disability among Older Americans

Anthony Richard Bardo

Introduction

Since 1960 the rate of obesity for American adults has increased from13 percent to 25 percent. This drastic increase in the rate of obesity over a respectively short period of time has prompted obesity to be labeled as an epidemic (Chen, Guo, 2008, Ferraro and Kelly-Moore, 2003). Obesity at all ages is associated with social stigmatization and health problems. However, examining the effect of obesity at old age is complex, because many aspects of aging and old age are also associated with morbidity and mortality (Kulminski et al, 2008, Wu et al, 2007). Experiencing obesity during one period of the life course, or throughout its entirety, has been found to increase the chances of disability at old age (Hayward, Friedman, Chen, 1996, Ferraro and Kelly-Moore, 2003).

Many factors besides obesity have also been found to be associated with the onset of disability. Examining disability through cumulative disadvantage theory can help to explain the role that obesity and other variables have with disability at old age. Cumulative disadvantage theory states that individuals accumulate disadvantages over their life course, which contributes to disadvantages throughout their lives and specifically in later life. Because age is the most significant predictor of disability (Wu et al, 2007), and obesity is commonly a result of cumulative disadvantage, cumulative disadvantage theory has been found to be an effective way to examine the effects of obesity on disability at old age (Ferraro and Kelly-Moore, 2003, Wilson, Shuey, Elder, 2007).

Race, sex, income, and previous health conditions are among the most common predictors of disability (Scharoun-Lee et al, 2009, Wu et al, 2007). The cumulative disadvantages associated with race and sex have been found to influence income, health outcomes, and disability at old age (Hayward, Friedman, Chen, 1996, Kim and Miech, 2009). For example, racial/ethnic minorities and women have been found to have greater chances of being obese and disabled in old age (Murtagh and Hubert, 2004, Taylor, 2008). The greater chance of obesity and disability that minorities experience can be attributed to the social disadvantages that they experience throughout their lives, and one of the most influential disadvantages includes structural limitations towards earning a higher income. Such as, access to an equal education, and employment discrimination.

Individuals with a lower income, on average, have lower levels of education and less ability to purchase healthy foods. Those with lower incomes are more likely to have lower health status and a higher mortality rate at a younger age, when

compared to those with higher incomes. Income has also been found to have a negative association with obesity (Kim and Miech, 2009). Higher rates of obesity are commonly associated with lower income, because of a variety of disadvantages. These disadvantages include a lack of education, time, and other resources to designate to physical activity, as well as a lack of economic resources to purchase healthy foods that prevent obesity and other health conditions leading to the onset of disability (Ferraro and Kelley-Moore, 2003, Hayward et al, 1996).

The most common health conditions associated with the onset of disability include arthritis, hypertension, stroke, and diabetes (Lang et al, 2007, Wu et al, 2007). It is important to note that health conditions can and do occur without the influences of obesity, however for obese individuals these health conditions tend to occur at a younger age (Ferraro and Kelly-Moore, 2003 Lang et al, 2007, Wu et al, 2007). Those who have better health outcomes are more likely to be physically active, not obese, and not disabled (Bruce, Fries, Hubert, 2008). In contrast, those with worse health outcomes have a higher likelihood of being less physically active, obese, and disabled (Ferraro and Kelley-Moore, 2003, Lang et al, 2007, Wu et al, 2007).

Objective

The overarching research question is whether or not the cumulative disadvantages associated with obesity increase the risk of disability in old age. Because disability and obesity have been found to be most commonly associated with the cumulative disadvantages of age, race, sex, income, and previous health conditions, five specific research questions are addressed:

(1) *Is obesity associated with physical disability in old age?* The obesity epidemic in the United States is considered to be fairly new. Therefore, the effects of obesity in old age have yet to receive much attention (Ferraro and Kelly-Moore, 2003). As obesity rates and longevity increase, and the mortality associated with obesity decreases due to medical advances, now is an important time to study the relationship of obesity and disability in old age. If obesity is related to physical disability in old age, then it is important to examine the most common variables associated with disability and obesity through cumulative disadvantage theory.

(2) *Are obesity and physical disability associated with race?* Race is one of the strongest variables associated with cumulative disadvantages, and racial/ethnic minorities have been found to experience obesity and disability at grater rates than whites (Hayward et al, 1996). In accordance with previous research it is proposed that non-whites will experience greater rates of obesity and disability in old age.

(3) *Are obesity and physical disability associated with sex?* Disability and obesity have also been found to be associated with sex. Due to both biological and social factors women are more likely to be obese than men. Women are also more likely to be disabled than men (Murtagh and Hubert, 2004). Based on cumulative disadvantage theory it is hypothesized that women are more likely than men to be obese and disabled in old age.

(4) *Are obesity and physical disability associated with income?* Income has been found to be a strong predictor of mortality increasing characteristics such as disability and obesity (Hayward et al, 1996, Ferraro and Kelley-Moore 2003). Individuals with lower incomes tend to have fewer resources such as money, education, and time to designate to exercise, and healthy foods which help prevent disability and obesity. Individuals with lower incomes, whom do not have the ways and means to prevent lower health outcomes, are hypothesized to have higher rates of disability and obesity.

(5) *Are obesity and physical disability associated with previous health conditions?* Health inequality due to a lack of economic resources exposes individuals with lower incomes to higher rates of morbidity and mortality. Through cumulative disadvantage theory it is also expected that individuals with previous health conditions will have higher rates of disability as well, because the health disadvantages will continue to accumulate over the life course, thus increasing the risk for disability (Ferraro and Kelley-Moore 2003).

For many years social science has recognized the health inequalities concerned with age, race, sex, and income. Cumulative disadvantage theory can be used to examine the different impact that each of the stated variables has on obesity and disability. Old age is a time when negative impacts of social inequalities tend to emerge most drastically, as disadvantages are accumulated throughout a lifetime.

The obesity prevalence in the Medicare population increased 5.6 percentage points from 1997 to 2002. In 2002 overall 21.4 percent of Medicare beneficiaries were obese, and 39.3 percent of disabled beneficiaries were obese (Doshi, Polsky, Chang, 2007). The cost of health care for an older obese person is drastically higher than for an older person of normal weight. For example, an obese 70 year old will currently live about as long as a seventy year old of normal weight, but will spend about $39,000 more on medical care (Lakdawalla, Goldman, Shang, 2005). Obesity and its negative health effects, such as disability, have been found to be preventable (Bruce, Fries, Hubert, 2008, Ferraro and Kelley-Moore, 2003). Research on obesity in old age can be used to help target and prevent individuals who are at risk.

Methods

This research utilizes the Second Longitudinal Study of Aging (SLSA) 1994 – 2000; Wave 3 survivor file. The SLSA has a sample size of 9,447. This data set surveyed respondents age 69 to over 99 years of age. It also provides basic demographic information such as main racial background, sex, and family income. The SLSA reports height and weight without shoes, and a history of the respondents' medical conditions. Furthermore, the SLSA provides the respondents' ADL and IADL level of impairment.

There are 17 categories available for the racial background question and an "unknown" option as well. For the simplicity of analysis main racial background was dichotomized into "white" and "other". 1.2% of the respondents selected the

"unknown" category, and as a result they were assigned to the "other" racial background category. The characteristics of each racial group can vary drastically, but comparing all minorities to whites allows for the focus of this research to remain on obesity. How obesity and disability varies by each race is a complex topic, of which future research should focus on.

Initial height and weight was recorded by trained medical personnel, and sub sequential height and weight responses were self reported. Height and weight measurements were used to calculate the respondents' body mass index (BMI), which is the main independent variable. BMI was calculated by dividing height by weight, and the results were conceptualized by the National Institutes of Health BMI categories. A score of less than 18.5 is underweight, 18.5 to 25 is normal weight, 25 to 30 is overweight, and a score greater than 30 is obese.

Older underweight individuals tend to be underweight because of health complications, and on average they are more disabled than their counterparts. Underweight individuals represent 1.5% of the total sample, and were removed from this analysis to better analyze how BMI affects disability. Removing underweight individuals from the analysis reduces the sample size from 9,447 to 9,203.

In the SLSA the number of health conditions category ranges from 0 to 8, and this analysis dichotomized the response range from 0 to 1 or more conditions. The category of no health condition means that the respondent had no major previous health problems, such as cancer or diabetes. Many health conditions can cause functional impairment, and a dichotomization of the number of health conditions allows for the assumption that just one health condition can affect functional ability.

The final independent variable included in this analysis is income. Family income ranged from under $5,000 to more than $50,000 with 8 response categories. The family income categories were recoded to; under $5,000, $5,000 to $14,999, $15,000 to $24,999, $25,000 to $34,999, and $35,000 or above. Initial analysis indicated that 83.9% of the difference in disability rates is accounted for between the lowest income category and the middle income category, which indicates that income is not a contributing factor towards disability above the middle income category. So, this analysis compares the poor with the more financially well off, where the poor category consists of a family income less than $15,000 and the well off category consists of a family income greater than $15,000.

The dependent variable of disability was measured using the provided ADL and IADL levels. A response of needing hands on assistance in two or more categories of either ADL or IADL is conceptualized as being disabled. In other words, disabled individuals are considered as needing hands-on help in two or more ADL or IADL categories. Hands-on help refers to individuals that need physical assistance from a caregiver to perform either ADLs or IADLs. The severity of the disability is accounted for by combining the ADL and IADL categories, and measuring the number of responses for "Needs Hands on Help". An answer of 0 to 1 is considered not disabled, 2 to 3 moderate disability, and 4 to 6 severe disability.

A review of previous literature and an early analysis of the crosstabs indicated that there are many variables other than BMI that affect the rates of disability.

Therefore, a logistic regression analysis was conducted on disability measuring for the effects of sex, BMI, age, income, race, and number of health conditions. Also, it is suspected that individuals with similar characteristics may be more likely to have previous health conditions, so a logistic regression analysis was conducted on the number of health conditions measuring for the effects of sex, BMI, age, income, and race. Even though obesity is the key dependent variable associated with disability in this research, the other factors contributing to disability should be examined.

Results

The majority of the sample is age 69 to 78, white, female and has a family income below $25,000. 86.5% of the sample reported having a previous health condition, and 16.5% are disabled. 75.9% of the disability is considered to be moderate, and 24.1% severe. Only 23.7% of the sample is considered normal weight, 37.6% is considered overweight, and 38.7% of the population is considered to be obese.

BMI is negatively correlated with age. 45.6% of 88 to 99 year olds are of normal weight, and conversely only 17.4% are obese. 19.7% and 43.6% of 69 to 78 year olds are respectively of normal weight and are obese. Disability is positively associated with age. 11.8% of 69 to 78 year olds are disabled, and 49.3% of 88 to 99 year old are disabled. The level of severity of disability also increased with age. The 88 to 99 year old population with a disability is 17% more likely to have a severe disability than the 69 to 78 year old population.

Non whites are more likely than whites to be obese. 45.6% of non whites are obese, and 37.6% of whites are obese. The total percentage of the obese population in this study is 38.7%. Whites are more likely than non whites to be normal weight; however whites are more likely to be overweight. Non whites are more disabled than whites. 15.6% of the white population is disabled, and 22.1% of the non white population is disabled. The average disabled population is 16.5%. Severity increases in the non white population. 6.2% of the non white disabled population has a severe disability, compared to the white disabled population with a severe disability at 3.6%.

BMI and sex are inversely correlated when compared to the original hypothesis. Based on previous literature it was originally hypothesized that women would be more likely to be obese than men. This analysis finds that men are 19.8% more likely to be obese than women. Men are also 2.3% more likely to be overweight than women are. However, as hypothesized women have a greater chance of being disabled than men do. Women with a disability are also more likely to have a severe disability when compared to men.

The largest relative percent of obese individuals have a family income under $5,000. The lowest relative percent of obese individuals have a family income over $35,000. Disability is also negatively correlated with income. Individuals in the lowest income category are 17.2% more likely to be disabled than the individuals in the highest income category. Disability rates decrease drastically from the lowest

income category until the middle income category, and then the rates tend to be more constant.

BMI and the number of health conditions are positively correlated. 86.5% of the sample reported having at least one health condition, compared to 89.9% of the obese population that reported having at least one health condition. The normal weight population is the most likely BMI category to not have a health condition. The most significant variable associated with the number of health conditions is BMI. Obese individuals are more likely than normal weight or overweight individuals to report having a health condition.

Discussion

The main focus of this research is whether or not the cumulative disadvantages associated with obesity increase the risk of disability in old age. In order to answer this question the association between obesity and old age was first examined. In this analysis, older individuals are less likely to be obese than younger individuals. The explanation offered for this phenomenon is that the obesity epidemic occurred at a time when the oldest population would have already established their lifestyle patterns. Furthermore, according to the association between obesity and mortality it is likely that the relatively few obese individuals in the oldest population would have died by this time, which reveals how death and disability are competing risks (Ferraro and Kelley-Moore, 2003).

This research reaffirms that age is the most significant variable associated with disability. It is this finding that led to the assumption that there is some other cause, which increases the younger populations' chances of disability. However, there are many variables that can increase the chances of disability, and a variable that distinguishes the younger population from the older population is necessary. Before analyzing the variable which varies the most between the youngest and the oldest populations (BMI), it is necessary to confirm that other more common variables are not the causes for the variation in disability.

Income, sex and race were used as control variables to adjust for the differences in disability between the youngest and oldest populations. First, disability and income are found to be negatively correlated. Poor individuals are much more likely to be disabled than their financial counterparts. However, 83.9% of the difference in disability rates is accounted for in the income categories under $25,000. This finding leads to the assumption that disability has the greatest affect on the poor, and there is not much difference between the middle and upper classes.

If income has an association with disability, then women and racial/ethnic minorities must also have an association with disability, if not only for the mere reason that they are groups that have cumulative disadvantages which lead to lower income. Women are more likely to be disabled than men, and non whites are more likely to be disabled than whites. These same findings are widely published, but they are important to examine because of the unexpected differences in obesity rates

between men and women. These findings help to assure that there is not something intrinsically wrong with the SLSA.

Furthermore, non whites are most likely to have a severe disability. These interesting findings are best explained by cumulative disadvantage theory, because racial/ethnic minorities on average have the most disadvantages over the life course. Some theories state that inequalities of disadvantages even-out over the life course, because the most disadvantaged die. However, these findings are in line with Hayward et al.'s (1996) discussion on how disadvantages build up over the life course of black men, and are apparent throughout their retirement years.

The main hypothesis states that obesity is positively associated with disability, and obesity is the variable that varies the most among the youngest and oldest populations of old people. Through a cumulative disadvantage perspective the logistical analysis concluded that obese individuals are more likely to have one or more health conditions than normal weight or overweight individuals. Also, the number of health conditions is positively correlated with disability. (See Table 1)

A logistic regression on disability shows that BMI is positively correlated with disability, and obese individuals are more likely to be disabled when controlling for age, sex, race, income, and health conditions. Furthermore, obesity is positively associated with the severity of disability. Other variables such as race and income which are associated with obesity are also associated with disability. This study shows that obesity is beginning to play a larger role with disability than it previously did, and this is most likely due to the aging of cohorts which are affected by the obesity epidemic. (See Table 2)

Conclusion

Advancements in the medical and technological industries have enabled obese individuals to live longer than before, and in the future this will indirectly increase the rate of disability in the older population. Future policy implications need to focus on the distribution of education and healthy foods that help to prevent obesity, and in turn will help to prevent disability and many other health conditions. These implications could also possibly help to decrease the amount of health care spending during old age.

Limitations of this study include advanced statistical analysis, an accurate measure for SES, and the recognition of all racial/ethnic minority groups individually. Future research needs to focus on how the obesity epidemic has affected different cohorts, how much obesity affects the health inequalities of women, ethnic/racial minorities, and individuals with lower income. Future research that takes this direction may find that health inequalities, which create inequalities in obesity, may be more influential in causing disability than age.

Table 1

Variables			Previous Health Condition			
			B	**S.E**	**Exp(B)**	**Sig.**
Age	**69-78®**	79-88	.178	.113	1.195	.114
		89-99	.642	.432	1.900	.138
Sex	**Male®**	Female***	.543	.096	1.721	.000
Race	**White®**	Other	.113	.154	1.120	.426
BMI	**Normal/Over®**	Obese***	.699	.102	2.012	.000
Income	**$0 - $14,999®**	$15,000 +	-.174	.104	.840	.093

®=Reference category, *** p<.001, ** p<.01, * p<.05

Table 2

Variables			Disability			
			B	**S.E**	**Exp(B)**	**Sig.**
Age	**69-78®**	79-88***	.758	.108	2.134	.000
		89-99***	1.984	.251	7.273	.000
Sex	**Male®**	Female***	.559	.117	1.749	.000
Race	**White®**	Other***	.455	.140	1.576	.001
BMI	**Normal/Over®**	Obese***	.362	.105	1.436	.001
Income	**$0 - $14,999®**	$15,000 +**	-.321	.104	.725	.002
PrevCond	**NoCond®**	YesCond*	.430	.175	1.537	.014

®=Reference category, *** p<.001, ** p<.01, * p<.05

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A Transnational Rite of Passage: Lived Experiences of Thai Students in Perth, Western Australia

Tannikarn Soonsinpai

Having seen a newly arrived Thai student in Perth withdrawing her overseas study for her second time, particularly because of her serious homesickness, led me to this doctoral research to understand the whole overseas experiences of international students in English-speaking countries such as Australia. For example, reasons for studying abroad, the trials that accompanied this choice, and their overseas experiences in general.

According to Guo and Beckett (2007: 117-118), "English has become the dominant global language of communication business, aviation, entertainment, diplomacy and the internet… English is also a precondition for employment and promotion, and professionals invest heavily in English language learning." It can be considered that a result of this English language expansion is an increasing number of international students seeking university qualifications in English speaking countries. The expansion of higher education in such countries as Australia has contributed to meeting the needs of the economic growth in Thailand and other parts of Asia (Ockey, 1999; Girling, 1996; Pasuk and Baker, 1996) According to Australian Education International (2005), Australia is the third among the top five English-speaking countries where international students enroll.

Table 1: Overseas Students in Australia from Top Ten Source Countries from Year 2002-2007

Countries	2002	2003	2004	2005	2006	2007
China	48,236	60,301	70,741	81,843	90,048	107,071
India	11,373	14,373	20,749	27,581	38,804	63,604
Korea, South	18,716	22,197	23,807	26,293	31,142	34,674
Thailand	***15,738***	***17,094***	***16,320***	***16,525***	***17,865***	***19,987***
Malaysia	17,540	19,827	19,994	19,336	19,118	19,874
Hong Kong	21,984	23,765	22,816	21,266	20,424	19,742
Japan	17,420	19,499	20,038	19,048	17,772	16,077
Indonesia	21,048	20,425	18,140	16,118	14,999	14,919
Brazil	4,232	3,822	4,731	7,075	10,170	12,545
United States	11,118	12,584	12,793	12,583	12,038	11,822
Others	87,482	94,101	95,240	98,304	110,100	134,870
Total	274,887	307,988	325,369	345,972	382,480	455,185

(Source: Australian Education International – Table A [2008])

Comparing the numbers of students from different countries studying in Australia during the past ten years, Thailand emerges as one of the top ten source nations, at number four, with China first (See Table 1), which suggests that Thai students are increasingly seeking overseas educational qualifications. Previous studies of overseas students focus on Asian students in general and on some particular nationalities. A small number concentrate on Thai international students (see for example, Mazzarol and Soutar, 2002; Pimpa, 2003a; 2003b; 2004; 2005a; 2005b; Cubillo et al, 2005; Crossman, 2005; Deveney, 2005). These studies tend to examine, for example, international students' choice of host country, adaptation to the new society, and academic and psychological difficulties studying overseas. Furthermore, these studies have relied upon data collected through questionnaires, surveys, and interviews. The existing academic literature on overseas students does not adequately document or explain students' experience at individual or collective levels, and there are not many studies that have explored the overall experiences of students.

My research is different from the previous studies in that I use ethnography to investigate the experience and achievements of Thai-born students. It intends to answer what these Thai students' studying abroad experiences are. I argue that their general overseas experience can be explained through the framework of 'rite of passage' concept.

The Rites of Passage

The term "rites of passage" was first used by Arnold Van Gennep to analyse rituals and ceremonies accompanying an individual's life stages which involve progressive changes in an individual's status, for example, birth, puberty, marriage, parenthood, and death (Van Gennep, 1960). The most obvious rite of passage in tribal societies is from childhood to adulthood. Van Gennep divides rites of passage into three phases: separation, transition, and incorporation.

In the separation stage, an individual leaves his group and starts moving towards another status or place. Common characteristics of this stage are being away from one's social setting, companions, and social statuses (Turner, 1967; 1969; 1974; Van Gennep, 1960).

The transition or liminal stage is an in-between stage during which an individual has left one status or place, but has not entered or achieved a new status. The individual needs to achieve some conditions in order to reach his goal and accomplish a new status. This liminal period was further developed by Victor Turner. Turner notes that a characteristic of an individual in this period is socially and structurally ambiguous, and that the person is 'betwixt and between' the states (Turner, 1967; 1969; 1974). Turner proposed that when a group of people goes through a liminal period together, "communitas" occurs. Communitas describes the

experience of a group of people during a liminal period. It is a communion of people sharing the same experience or feelings together when their regular statuses or the roles that divide them from others, such as social class, are ignored.

In the phase of incorporation, the individual's new social status is achieved and he re-enters his society with a new identity. Common characteristics of this stage are achievement of a new stable social status and identity; re-entry into ordinary social life; and the adoption of behaviour in keeping with the expected norms and duties of the new social position. However, as Turner (1974: 232) suggested, an individual does not always re-enter society with a higher status. He further noted that the individual's social status may be either elevated or degraded. This suggests that an individual can fail in his or her passage.

There are many studies on rites of passage and education (see for example, White, 1989; Deegan and Hill, 1991; Head, 1992; Barton, 2007); however, most of the research focuses on a single aspect of students' educational experience, such as studying as a liminal phase, while only some of them focus on all three phases of separation, liminality and incorporation described by Turner (1967; 1969; 1974) and Van Gennep (1960). My research is an addition to the literature as I focus on all three stages of Thai overseas students' experience using the rites of passage concept as the analytical framework. I propose that Thai students' departure from their families and their home country can be understood as the beginning of the separation phase in their educational rite of passage. During their life in Perth, Thai students enter a stage of transition. Although they have acquired a new student status, they are in the process of completing their study and do not yet have a graduate status. When the students return home with their new graduate status they undergo a process of incorporation back into Thai society.

Methodology

Ethnography is the main methodology of this anthropological research. The informants are recruited mainly through snowballing techniques. This study has two field sites, Australia and Thailand. I used several methods to collect data. One of the main methods was participant observation. Participant observation allowed me to spend my time with the key informants and with the community groups with which they associate, and to visit the places they frequently go to. Interviews were both formal and informal, and were done on a one-to-one basis. All interviews and conversations were spoken in Thai language, which is the mother language of all key informants including myself. Talking in our own language allowed us to express our thoughts, opinions and ideas freely. All interactions and events I attended with the key informants were noted in diaries.

Informants

There are a total of 30 Thai-born key informants contributed to this study – 12 males and 18 females. I categorise my informants into two main groups. The first group contains family-funded students who were enrolled in Master's degree by coursework. The second group consists of students being funded by governmental scholarships to do PhD degree by research. In accordance with their social patterns and with the ways that they referred to each other with age status of being younger or older, I shall call the Masters students, who vary in age from early to mid 20s, the younger group, and the PhD students, who range in age from late 20s to early 40s, as the older group. I explore whether both groups share the same experiences through their rites of passage as overseas students. Although my informants did not verbally distinguish themselves in terms of the two groups I have proposed, they seemed to live their lives and interact with one another according to factors discussed earlier.

The Separation from Thailand

In the separation stage, participants are found to have different motivations. Thai society itself has been growing, and some of the outcomes are the increased demand in employment and social competition. It has created more pressure for the younger generation of students to compete with each other over valued employment opportunities. The younger students' experiences show that this social context is a significant factor contributing to their desire to achieve an academic qualification as high as they can in order to elevate their social status. It is clear from these trends that societal change influences the younger students and their families to believe that studying abroad can bring them many benefits and the most important one is social status. It was found that the younger students' parents play an important part in encouraging the students to do a higher degree overseas.

On the contrary, having a career, living on their own, and, in a few cases, establishing their own families, have made the elder students more independent from their parents. In this way, it can be considered that most of the elder students have already entered their adulthood before leaving for Australia. Working in an academic field was found to be the main reason the elder students do their doctoral degree abroad. My research found that the elder students study abroad because of the personal desire to improve and advance their career and their awareness of new opportunities in Thailand that come from higher educational credentials, which is different from the younger ones who are more influenced by parental desires. In addition, the elder students all had the benefit of a scholarship to support them.

When examining the choice of overseas institution of the older and the younger students, it was found that parents of younger students in the study had a clearer and significant influence on the choice of a place to study. Other issues the younger students considered when choosing a place to study included familiarity and proximity. The importance of proximity to the decision of where to stay indicates that the issue of transnationalism, in particular the ability to stay in close communication

with parents and to visit often, is a significant feature of the younger students study abroad experience from the very beginning of their overseas stay. In contrast, the elder students choose an institution based on available courses and supervisors. Some of the informants were recommended institutions by colleagues. The factors of proximity and familiarity (particularly climate) were of significant concern to at least some of the elder students when considering which city to live in. In this regard, they expressed a similar desire of feeling close to home.

When reflecting on the issue of choice of place to study in reference to the notion of rite of passage, both the younger and the older students were not willing to be completely separated from their home society and, arguably, their former identities such as being Thai, which is not strictly in keeping with the characteristics of the separation stage where an individual leaves his/her previous social setting and social statuses both socially and physically.

Studying Overseas as a Liminal Period

The Liminal Status

In this study, the liminal stage has been proposed as the period informants studied overseas. While in Perth, both the younger and the elder students reported experiences of retaining some of the identities they had before leaving Thailand, for example, the younger ones said they were expected to be an international student, not a local Asian-Australian citizen; while many elder students were often expected by Thais overseas to already have a career as university lecturer. The continued importance of previous statuses and identities contrasts with the classical definition of the liminal concept according to which an individual leaves all statuses behind upon their separation.

Connections with Home

While living in Perth, both the younger and the elder students share close connections and contact with kin and friends back home in Thailand. These connections represent informants' cross-borders practices between Australia and Thailand. Holiday home visits also strengthen the bond between the younger students and their former social life and pre-departure identities. The idea that an individual is totally separated from his/her former life is only partially true for the informants who participated in this study.

Students as Consumers

Studying in Perth was found to bring various experiences to the informants. The amount of money students have was found to be a significant factor in increasing their enjoyment of the overseas experience or making it easier to cope. The younger students were found to enjoy their daily life by being open and trying out new things around them as if they were tourists. In contrast, the elder students had to concentrate much more effort on saving money and spending as little as possible because of limited money from their scholarships.

Overseas Difficulties

The difficulties that the elder students experienced relating to their finances could be understood as the major challenge and problem they faced as part of their liminal stage. Studying in Perth is seen to bring some difficulties to the younger students during their early period due to a different learning style in class. On the other hand, the elder students did not experience the Australian classrooms like the younger students, as the elder ones are research students so their academic experience is seen to entail more independent learning. Besides academic difficulties, the hardest difficulty informants are found to have, particularly the younger students, is homesickness.

New Social Networks

Communitas is a characteristic of the liminal stage suggested by Turner (1969) as a communion of similar people sharing a sense of equality and togetherness. The informants were found to have the strongest friendship with other Thai overseas students. Friendships are sub-divided by age and social status or position separating the informants into two groups, the younger and the elder. When examining friendships in each informant groups, both groups seem to establish small Thai communities. Although these informants have good relationships among each other, they generally do not have cross-group relationships between the elder and the younger group, because of their different age and status identities. These characteristics suggest that there is no shared experience of communitas either within or between informant groups. Hence, in this regard the rites of passage concept is not a totally suitable tool to explain Thai informants' community in Perth.

Incorporation: Returning Home with New Status, Social Capital and Cultural Capital

For the incorporation stage, I have proposed this stage as informants' completion of overseas study and their return to Thailand with their higher degrees. After completing their new degree and returning to Thailand, some of the informants are celebrated with congratulations parties from family, friends, and colleagues, indicating the informants' home incorporation. The elder and the younger students are admired by other people when they return with their new status, but the data has shown that the elder students are more admired and honoured. As the elder students achieve a PhD degree, the status from the degree and the benefit from gaining it overseas with a scholarship are found to endow the elder students with a higher social status. These informants are also expected to be able to have good English skills, as many of them reported that their jobs have become more involved with English language than some other locally graduated colleagues, for example, communicating with foreigners and giving a speech in English.

The journey to gain an overseas degree results in different outcomes for the younger and the elder students. The younger students have their first experience of living on their own and taking care of themselves away from home. This experience

has transformed them into more mature individuals. The elder students have more experience relying on themselves as most of them have lived on their own before and have been working to support themselves. They have already grown into adulthood. The objective of the overseas education for the elder students is to complete a new degree and gain a new more prestigious status rather than to be more mature.

Conclusion

In conclusion, categorising informants into two student groups was a useful way to analyse Thai overseas students' experience. The rites of passage concept was found to be more relevant to the younger than the elder students. The concept is useful when explaining the younger group's new status achieved with their new academic degree and increased maturity and adulthood. However, the concept is not as useful when explaining the elder group's adulthood. There are some features of the rites of passage concept that do not fully explain the informants' experiences. Although the informants were separated from their society and were living in Perth, they still carry some previous statuses and connections with them. The informants experience a sense of shared belonging together, particularly of being Thai students although physically being overseas. There is a strong sense of community developed in each student group but each group still separated themselves by age and homeland status. Thus the experience of communitas does not clearly exist among the informants, as there are still unequal status identities and social boundary between the informant groups, reflects the hierarchical nature of Thai society itself. The rites of passage concept is thus not universal as suggested by some literature on educational rite of passage (for example, Barton, 2007). These findings are an addition to this literature. Nevertheless, this study also contributes to Van Gennep (1960) and Turner's (1967; 1969; 1974) rites of passage concept by suggesting that it is useful and can be employed to provide a general to understanding of students' overseas experiences, even though some aspects of that experience are not captured by the concept. Future research should further examine experiences of other international students, not limited only to Asian students.

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Relationship between Child Mortality and Fertility among Ever Married Women in Lao PDR

Vilaysook SISOULATH

Abstract

This study examines the relationship between child mortality experience and fertility of ever married women aged 15-49 in Lao PDR. Data analyzed for this study is from 10,288 ever married women surveyed in the Lao Reproductive Health Survey conducted in 2005. It is found that almost one-fourth of the samples ever had experience of child loss. On average, number of children ever born to a mother who has no experience of child loss is 2.9, while it is 5.3 for those who ever had such experience. The results from multiple regression analysis demonstrated that after controlling for socio-economic and demographic factors, namely, education, employment status, ethnicity, place of residence, age, age at first marriage, contraceptive use, ideal number of children, and abortion experience, number of children died was positively related to the number of children ever born. An additional child died increased the number of children ever born by 0.94 ($P<0.001$).

The result confirms the hypothesis that women who have experience of child loss have more number of children ever born than those who do not have any child loss. It suggests that to effectively reduce fertility level, the child survival program should be strengthened. It can be done through improving the quality of newborn and child survival program. This program will not only reduce child mortality but will also reduce fertility in the long term.

Keywords: Child Mortality/Fertility/Lao PDR

Introduction

Lao PDR is considered to have high fertility rate. Data from the Population and Housing Census 2005 shows that the Total Fertility Rate (TFR) is 4.5. Moreover, the Child Mortality rate in 2005 is 97.6 per 1000 live births which is three to four times higher than that of some neighboring countries in ASEAN region (ESCAP, 2008). However, it is found that both fertility rate and child mortality rates of the country have declined gradually. TFR has dropped from 5.0 in year 1995 to 4.5 in 2005 (SCCPH, 2006). The child mortality rate has also decreased from 170 in 1995 to 97.6 per 1000 live births in 2005. The decline in both fertility and mortality seem to be consistency with demographic transition theory that declining in mortality was generally followed by declining in fertility.

The fertility respond to infant and child mortality is stated as a combination of short term physical effect and long term behavioral replacement effects (Preston, 1978). At individual level, the child mortality reflects fertility through three mechanisms (Preston, 1978). The early death of a child exposes a woman to a sudden stop of breastfeeding. This biological effect causes the resumption of ovulation that increasing a chance to be pregnant. On other sense, the couple will attempt to have more children when they experienced a child loss for replacement the dead child or fulfill their family size target, which is called replacement effect. In the Society with high level of child mortality, the couples will bear more children than the desire family size in anticipation that some may die. This strategy is called insurance effect.

According to findings of previous studies, child mortality experience was strongly related to fertility. That is, women who experienced a child death were more likely to have higher fertility in order to replace the dead child and fulfill their family size target than those who did not ((Hongladarom and Hashimoto, 1981; Syamala, 2001; Obonyo, Otieno, and Muga, 2005; Hossain, Phillips, and LeGrand, 2005; Dust, 2005 and Angeles, 2008)). Nonetheless, relationship of the decline in fertility and child mortality rates in Lao PDR has not been studied. Therefore, this study is aimed to examine the relationships between child mortality and fertility as well as identify the level and pattern of fertility of ever married women in Lao PDR. The results from this study are expected to be a useful reference for policy makers to have more effective fertility control programme.

Data and Methodology

This analysis is based upon data from the Lao Reproduction Health Survey conducted by the Department of Statistics in 2005. Data analyzed for this study is from 10,288 ever married women surveyed in the Lao Reproductive Health Survey conducted in 2005. The fertility is measured by number of children ever born while the number of children died at age less than 5 years is used as the child mortality variable. Other socio-demographic characteristics such as age, education, employment status, place of residence, age at first marriage, contraceptive use,

ethnicity, ideal number of children and abortion experience are used as control variables.

The bivariate analysis by using one-way ANOVA test is used to identify the differential level and pattern of number of children ever born. The multiple linear regressions model is used to examine the partial effect of independent to dependent variable.

Findings

Socio-economic characteristics of respondents

Among 10,288 ever married women aged 15-49 years old, most of the women studied in this had low levels of education. While 46.8 percent completed only primary education, 32.5 percent had no formal education. Approximately two-thirds of all women were employed. The majority (79.5 percent) of them were living in the rural area**.** Almost half of them belong to Lao tribe.

Women tended to get married at young age. Among all, approximately 65 percent of them got married when they were less than 20 years old. About 63.5 percent were not using any contraceptive methods while only 36.4 percent were practicing at least one method. The ideal number of children is about 4 children. About 13.8 percent had experience of abortion or miscarriage.

Fertility and child mortality

Figure 1 presented the percentages distribution of 10,288 women aged 15-49 years by experience of birth and child death**.** Almost of women in this study have experience of birth which is covered about 91, 8 percent. Nearly one-four of them ever had experience of child death.

N= 10,288

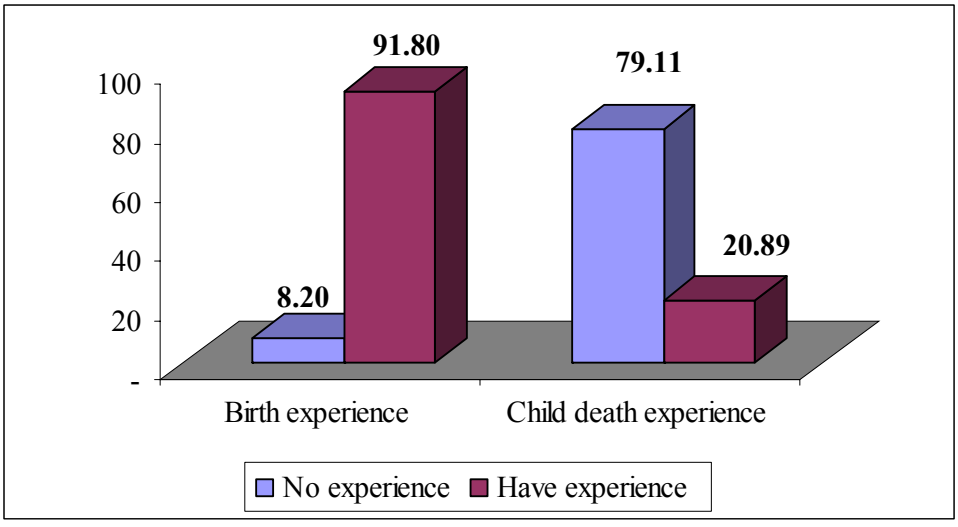


Figure 1: Percentage distribution of respondents by experience of birth and child death

Level and pattern of children ever born by experience of child death

Figure 2 showed mean number of children ever born according to experience of child death by using one-way ANOVA test. It found that number of children ever born was significantly different according to experience of child death (P<0.001). Increasing in number of experience of child death is trended to be increasing in number of children ever born. On average, number of children ever born to a mother who has no experience of child death is 2.9, while it is 5.3 for those who ever had such experience.

N= 10,288

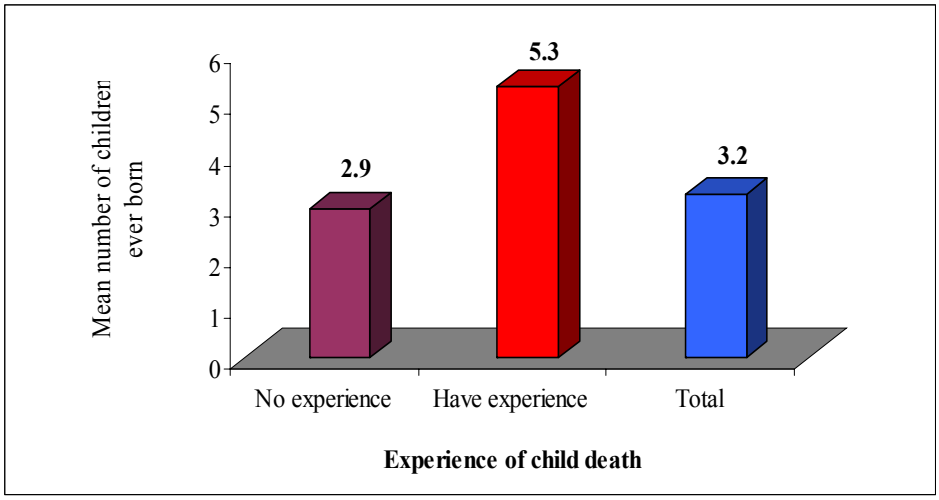


Figure 2: Mean number of children ever born by the experience of child death

*** Significant at the 0.001 level

The differential of number of children ever born can be observed by number of children died as show in table 1. It can be seen, the number of children ever born of mother with no experience of child death was 2.9 children compared to 4.3 children when they experienced a child death at least one time. The number of children ever born is increased to 5.7, 7.0, 8.1, and 9.4 when the number of children died increased to two, three, four and five and more. These differences are significantly different at 0.001 significant levels.

Table 1: Number of children ever born by number of children died

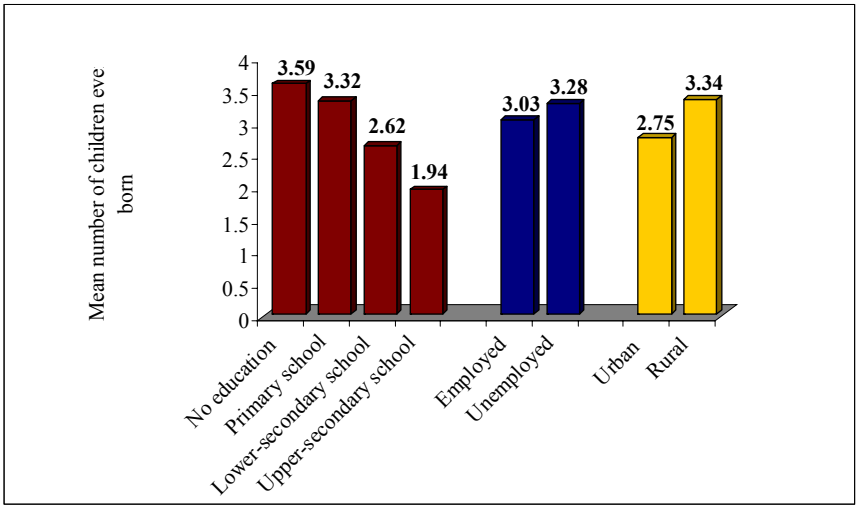
Indicators	Number of children ever born	F-values
Number of children died (age < 5 years)		***897.42******
None	2.98	
One	4.36	
Two	5.74	
Three	7.02	
Four	8.19	
Five and more	9.49	
Total	***3.22***	

*** Significant at the 0.001 level

Average number of children ever born by socio-economics factors

Figure 3 presented average number of children ever born by socio-economics characteristics, using one-way ANOVA test. The results revealed that an average number of children ever born of each group were significantly different (P<0.001). Women with lower education, unemployed and lived in rural area have higher number of children ever born than those who have higher education, employed and live in urban area.

N= 10,288



*** Significant at the 0.001 level

Figure 3: Average number of children ever born by socio-economics Characteristics

Average number of children ever born by demographic factors

Like socio-economic characteristics, the results revealed that the average number of children ever born was significantly different among different demographic groups (P<0.001). Women in older age group were more likely to have higher number of children than woman compared to those who have younger age. The high fertility are also found among those who married at early age, use contraception, have higher ideal number of children and have experience of abortion or miscarriage. There was no major difference in the average number of children ever born among groups of ethnic women. Lao tribe had the lowest number of children ever born while the highest was found in Yaroo tribe.

Table 2: Average number of children ever born by socio-demographic characteristics

Socio-demographic characteristics	Mean	F-Values
Age group (N=10,288)		**2024.94*** **
15-24	1.37	
25-34	2.93	
35-49	4.49	
Age at first marriege (N=9,846)		**45.80*** **
Less than 20	3.35	
20-24	3.03	
25-29	2.63	
30 and more	1.75	
Contraception practiced (N=10,288)		**89.84*** **
Yes	3.50	
No	3.06	
Ethnicity (N=10,288)		**17.79*** **
Lao tribe	3.02	
Khamu	3.48	
Yaroo	3.79	
Akha	3.25	
Mhong	3.65	
Other	3.26	
Ideal number of children (N=10,288)		**1094.03*** **
1-2 children	1.76	
Three or more	3.51	
Abortion experience (N=10,288)		**178.64*** **
Yes	3.96	
No	3.10	

*** Significant at the 0.001 level

Factors effecting number of children ever born

This section discusses the effect of each independent variable and explains the variation of number of children ever born according to each independent variable. The process of regression analysis can be divided into two stages. In the first stage, only the number of children died was included into the model in order to test the hypothesis of this study. In the second stage, socio-economic and socio-demographic factors were also included into the model at the same time as the controlled variables.

Child mortality and fertility

The results from the first model shows that, when only the number of children died and the number of children ever born were included in the model, number of children died was significantly related to number of children ever born ($P<0.001$) and R-square was 0. 30. It means that the number of children died can explain the variation in the number of children ever born by 30 percent.

When all independent variables were added into the model, R-square increased from 0.30 to 0.60. That is, the set of independent variables can explain the variation in the number of children ever born by almost 60 percent. Therefore, it was reasonable to conclude that the proposed model was the best fitting model in predicting the effect of number of children died on the number of children ever born, after controlling for other socio-economic and socio-demographic factors. The coefficients shown in table 2 represented the effect of each independent variable on the dependent variable. The results from the augmented model showed that, the number of children died significantly and positively affected the number of children ever born at 0.001 significant levels. To be more precise, an additional number of children died to a woman tended to increase the number of children ever born by almost one, while other variables in the model were controlled for ($b = 0.94$).

Socio-economic and demographic characteristics and fertility

Women's educational level showed a significantly negative effect on the number of children ever born. For primary education, the coefficient was -0.07 in comparison with to the uneducated group. This means that, the fertility level of primary educated women was 0.07 lower than that of the uneducated women. However, higher educational level seemed to have greater effects on reducing the number of children ever born, as evidenced by the coefficients of -0.13 and -0.28 for women who completed lower and upper secondary school, respectively. A significant and positive effect of women's employment status on the number of children ever born implied that, women who were employed were more likely to have higher number of children ever born than those who were unemployed by 0.08, when controlling for other variables. The place of residence is another factor that significantly affected fertility. In general, urban women are found to have fewer children than those rural women. The results from this study confirmed such conclusion in that women those who lived in urban areas tended to have lower number of children ever born than those who lived in rural areas by -0.21.

Women's age is another well known factor expected to have a positive effect onto fertility. The results from this study supported the argument that, the age of the women was positively affected the number of children ever born as it was shown that an increase in women's age increased fertility by 0.12. On the contrary, women's age at first marriage included in the regression model showed a significant negative effect on the number of children ever born (b= -0.12). The coefficient of 0.44 on the contraceptive practice also showed a significant positive effect on fertility. Women who were using any contraceptive methods were likely to had higher number of children ever born by 0.44 than those who were not using one or other methods while other variables were controlling for. Considering the variation of the number of children ever born by ethnicity, it was found that almost all ethnic groups had significant positive effects on the number of children ever born, except for Akha and other ethnic groups. It means that being Khamu, Yaroo, and Mhong raised the number of children ever born by 0.20, 0.83, and 0.62 children comparing to those being Lao while controlling for other variables. Regarding the women's ideal number of children and fertility, an increase in the ideal number of children tended to increase the number of children ever born by 0.28 children. The regression results also pointed out those women who had abortion experience were likely to have higher fertility than those who did not by 0.16 children.

Table 3: Coefficient of child mortality and other factors on number of children ever born

Independent variable	Model 1		Model 2	
	Coefficient	**t-value**	**Coefficient**	**t-value**
Number of children died	1.416	66.23***	0.942	53.59***
Controlled variables				
Women's education				
No education (Ref)				
Primary school			-0.076	-2.10*
Lower secondary school			-0.137	-2.70**
Upper secondary school			-0.284	-3.97***
Women's employment status				
Unemployed (Ref)				
employed			0.087	2.41*
Place of residence				
Rural (Ref)				
Urban			-0.216	-5.45***
Age			0.126	65.81***
Age at first marriage			-0.127	-27.90***
Contraceptive use				
Not use (Ref)				
Use			0.442	14.31***

Table 3: Coefficient of child mortality and other factors on number of children ever born *(Continued)*

Independent variable	Model 1		Model 2	
	Coefficient	t-value	Coefficient	t-value
Ethnicity				
Lao tribe (Ref)				
Khamu			0.206	4.44***
Yaroo			0.843	4.82***
Akha			-0.071	-0.81
Mhong			0.627	10.15***
Other			0.596	1.63
Ideal number of children			0.286	28.45***
Abortion experience				
No (Ref)				
Yes			0.167	4.00***
N	**9,846**		**N**	**9,846**
R-square	**0.30*** **		**R-square**	**0.603*** **

Significant at p= 0.05; ** p = 0.01**;** ***p = 0.001

Discussion

Child mortality affect on fertility

This study hypothesizes that women who experienced a child death are more likely to have higher fertility than those who did not have such experience. Consistent with those previous studies (Hongladarom and Hashimoto, 1981; Syamala, 2001; Obonyo, Otieno, and Muga, 2005; Hossain, Phillips, and LeGrand, 2005), after empirically investigating the relationship between these two factors, the results provided evidence that were in support of the positive relationship between child mortality and fertility as hypothesized. Among those when women experienced a child death, their possibility of having higher fertility increased. This study illustrated that, on average, a woman would have 2.9 children if they did not experience a child loss, but the number would markedly increase to 5.3 children per woman if they faced at least one child death. It implied that, women who experienced a child loss were more likely to have more children in order to fulfill their targeted family size or to replace the dead child. Furthermore, the finding from the multivariate analysis confirmed that child mortality was significantly and positively related to fertility at 0.001 significant levels. An additional number of children died tended to increase the number of children born by one children (b=0.94), the finding which was similar to the existing studies (Fitaw, Berhane, and Worku, 2004; Dust, 2005).

Though the results did provide explicit information on the relationship between these two factors, due to data limitation, it was still unclear whether the underlying relationship was the result of the insurance or the replacement effects.

However, in the situation where the prevailing child mortality level is high, the couples tended to perceive it as a risk and would have more children in order to attain a desired number of surviving offspring at the end of their reproductive lives or to protect them self against any risks of child death in the future (Doepke, 2004). In the Lao society where child mortality is high and the desire for large family size is still maintained (Boupha et al., 2005); it is possible that the couples may bear more children in response to the replacement and the insurance effects. The other possible reason is that, since this study found that most of the women (80 percent) lived in rural areas and had low levels of education, these women might find it is difficult for them to access health facility services as well as family planning. They may not receive proper information on the benefits of having fewer children, thus the prevalence rate of using contraception is low and thus the fertility is still high. Another possible reason is that, for the fact that Lao PDR comprises of diverse ethnic groups, (49 ethnic groups- SCCPH, 2005), different customs and culture in terms of marriage may be responsible for such a high level of fertility as this study found that more than half (65 percent) of them married at the age less than 20 years old.

Conclusion

The first objective of this study is to identify the level and pattern of fertility according to the experience of child loss and some key socio-economic and socio-demographic factors. Empirical evidence in support of the first objective showed that almost one-fourth of the samples ever had experience of child loss. On average, number of children ever born to a mother who has no experience of child loss is 2.9, while it is 5.3 for those who ever had such experience. These findings were consistent with the theoretical mechanism of the replacement and the insurance effects, that is, when women experienced a child loss; they are more likely to have more children in order to replace the child who died or to fulfill their targeted family size. The level and pattern of fertility according to some key socio-economic and socio-demographic factors demonstrated that among women who have older age, higher ideal number of children, lower educational level, and lived in rural have higher number of children ever born than those who have younger age, lower ideal number of children, higher educational level, and lived in urban area.

The second objective is to examine the relationship or effect of child mortality on fertility. The results from multiple regression analysis demonstrated that after controlling for socio-economic and demographic factors, namely, education, employment status, ethnicity, place of residence, age, age at first marriage, contraceptive use, ideal number of children, and abortion experience, number of children died was positively related to the number of children ever born. An additional child died increased the number of children ever born by 0.94. Therefore, the hypothesis is accepted.

Policy implication and recommendation

The main recommendations for fertility control programmes can be drawn from this study are as follow.

- Infant as well as child mortality is a very important factor that affects fertility. If people still perceive the high level of child mortality as a risk, their attitude or behavior towards having higher number of children would still exist. Therefore, to effectively reduce fertility level, policies to improve the quality of the newborn and child survival programmes should be strengthened.
- This study also found that education and age at marriage are also important factors that related to fertility; therefore, program to reduce fertility can be done through others means, for example, promoting education of women and delay age at marriage.

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Child Undernutrition and Mortality in Kanchanaburi Demographic Surveillance System (KDSS), Thailand

Munkhzul Zookhuu[11]

ABSTRACT

This study examines whether factors affecting child undernutrition are the same as factors affecting child undernutrition and mortality (hereafter, referred to as undernutrition-mortality). It is an attempt to examine the theory that child mortality is an ultimate consequence of undernutrition and that factors affecting child undernutrition and undernutrition-mortality are common to each other in most developing countries such as Thailand. From KDSS 2004, 2,765 children under five were selected. Two Partial Proportional Odds Model analyses with different dependent and the same independent variables were undertaken. The results show that the factors affecting child undernutrition are not exactly the same as the factors affecting child undernutrition-mortality. However, there are several factors in common such as household wealth, mother's education, mother's working status, and source of drinking water. Thus, it is concluded that the results provide a conceptual proof for the theory in KDSS context although there were some limitations in the study. Longitudinal studies should be undertaken in order to suggest empirical proof for the theory.

Keywords: CHILDREN UNDER FIVE / CHILD UNDERNUTRITION / CHILD UNDERNUTRITION-MORTALITY / KDSS / PARTIAL PROPORTIONAL ODDS MODEL / CHILDREN'S NUTRITION STATUS / CHILDREN'S NUTRITION-MORTALITY STATUS

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Morbidity and mortality among children under five in developing countries have decreased remarkably since the 1980s with the help of increased coverage of cost-effective interventions such as immunization and Vitamin A supplementation and improved primary health care (UNICEF, 2007). For the first time, in 2006, the total number of annual under-five deaths fell below 10 million (UNICEF, 2007) although it is not an acceptable level. Improvement in children's nutrition status has contributed dramatically to this reduction in child mortality. According to the UNICEF's latest publication (2007), undernutrition is implicated in up to 50 per cent of all under-five deaths in developing countries.

Thailand is one of developing countries where substantial achievement regarding child well-being occurred. The country has reached the Millennium Development Goal (MDG) Target of halving the proportion of people who suffer from hunger (NSO, 2006). Moreover, it was considered as a country where comparatively low mortality among children under five (7 deaths per 1,000 live births) occurred (UNICEF, 2004). Thailand has implemented the very successful National Food and Nutrition Plan (NFNP) since 1962, which contributed a lot to reduction in child undernutrition and mortality. This plan was able to succeed because main underlying causes of undernutrition such as lack of nutrition investment, unavailability of and inaccessibility to basic health care, inadequate quality of drinking water and sanitation, poor hygienic conditions in households and health centers, and inadequate nutrition education are predictable, preventable, and can be addressed through affordable means. In addition, there are many other national programs that contributed to child well-being such as Debt Reduction Schemes, the Village Fund, Micro-credit Schemes, Low-cost Housing, and the Universal Health Scheme (Vapattanawong et al., 2007).

However, there are still disadvantaged children in high risk of facing undernutrition and mortality. In the poorest area, one per cent of Thai population, mortality is as high as 40 deaths per 1,000 live births (Vapattanawong et al., 2007). The underweight prevalence (15%) among children living in poorest households is much higher than that (4%) among children living in richest households (NSO, 2006). Moreover, Kanchanaburi Demographic Surveillance System (KDSS), which was designed to record population changes in 100 communities in Kanchanaburi province of Thailand between 2000 and 2004, reveals that children living in poor economic strata such as uplands stratum are more likely to experience mortality (IPSR, 2007).

It is well known that many infectious diseases such as pneumonia, diarrhea, neonatal severe infections/sepsis, malaria, and measles are main direct causes of millions of unnecessary deaths among children under five each year and undernutrition is main underlying cause of these deaths. Moreover, severely undernourished children face much higher risk of dying compared to healthy children. This also implies for moderately and mildly undernourished children (Onis, 2000; WHO, 2002). Also, undernutrition and under-five deaths are caused by a number of common underlying factors such as household food insecurity, inappropriate health and nutrition services, inadequate quality of drinking water and sanitation, poor

hygiene practices, female illiteracy, and early pregnancy (Mosley & Chen, 1984; Black et al., 2008) and direct causes such as inadequate dietary intake and infectious diseases.

Those situations raise the question – if child mortality is an ultimate consequence of undernutrition and factors affecting child undernutrition and mortality are common to each other, why not integrate undernutrition and mortality into one dependent variable?

Firstly, in 1984, Mosley and Chen reasonably argued that combining undernutrition with mortality into one dependent variable may have potential to strengthen explanatory power of the factors affecting child survival.

Based on their argument, it is thought that a comparison between factors affecting children's nutrition status and factors affecting children's nutrition-mortality status can be undertaken in order to support or oppose the theory.

Thus, the research question was formulated as "Are the factors affecting children's nutrition status and children's nutrition-mortality status common to each other?"

Ultimately, the research is an attempt to examine the theory that child mortality is an ultimate consequence of undernutrition and factors affecting child undernutrition and undernutrition-mortality are common to each other in most developing countries such as Thailand.

Meanwhile, the immediate objective is to see whether children's nutrition status and children's nutrition-mortality status are likely to be influenced by a common set of factors in KDSS context by (1) exploring factors affecting children's nutrition status and (2) exploring factors affecting children's nutrition-mortality status.

Definitions

- Weight-for-age index indicates body mass relative to chronological age. It is commonly used for assessing nutrition status of children under five due to its advantage of reflecting both past/chronic and present/acute undernutrition (Cogill, 2003). A weight-for-age Z-score describes how far, in units called standard deviations (SD), a child's weight is from median weight of children at the same age in reference population. Generally, according to weight-for-age Z-scores, children's nutrition status can be classified as below:

-3.00SD <= Z-scores	– severely undernourished
-2.99SD <= Z-scores <= -2.00SD	– moderately undernourished
-1.99SD <= Z-scores <= -1.00SD	– mildly undernourished
-0.99SD <= Z-scores <= +0.99SD	– normal nourished
+1.00SD <= Z-scores <= +1.99SD	– mildly overnourished
+2.00SD <= Z-scores <= +2.99SD	– moderately overnourished
+3.00SD >= Z-scores	– severely overnourished

- Children's nutrition status was used rather than the term, "child undernutrition" because this study analyzed normal/over-nourished children besides undernourished children. Nutrition status of surviving children was measured by weight-for-age index with four categories as below.
    1. Severely undernourished (-3.00SD <= Z-scores)
    2. Moderately undernourished (-2.99SD <= Z-scores <= -2.00SD)
    3. Mildly undernourished (-1.99SD <= Z-scores <= -1.00SD)
    4. Normal/over-nourished (-0.99SD >= Z-scores)

Due to the assumption that overnourished children are not likely to die because of nutrition deficiency although they may have risks of developing health problems at later ages, normal nourished and overnourished children were grouped into one category.

- Children's nutrition-mortality status was used rather than the term, "child undernutrition and mortality" (hereafter, referred as child undernutrition-mortality) because this study analyzed deceased children besides undernourished and normal/over-nourished children. Here, nutrition status of surviving children was combined with mortality status of deceased children into children's nutrition-mortality status. Thus, it has five categories.
    0. Deceased (no Z-scores)
    1. Severely undernourished (-3.00SD <= Z-scores)
    2. Moderately undernourished (-2.99SD <= Z-scores <= -2.00SD)
    3. Mildly undernourished (-1.99SD <= Z-scores <= -1.00SD)
    4. Normal/over-nourished (-0.99SD >= Z-scores)

Theoretical Background

Most frequently referred and well-known theoretical frameworks dealing with determinants of child undernutrition or mortality in developing countries are Mosley and Chen's analytical framework (Hill, 2003) and UNICEF's framework (UNICEF EAPRO, 2003; Black et al., 2008).

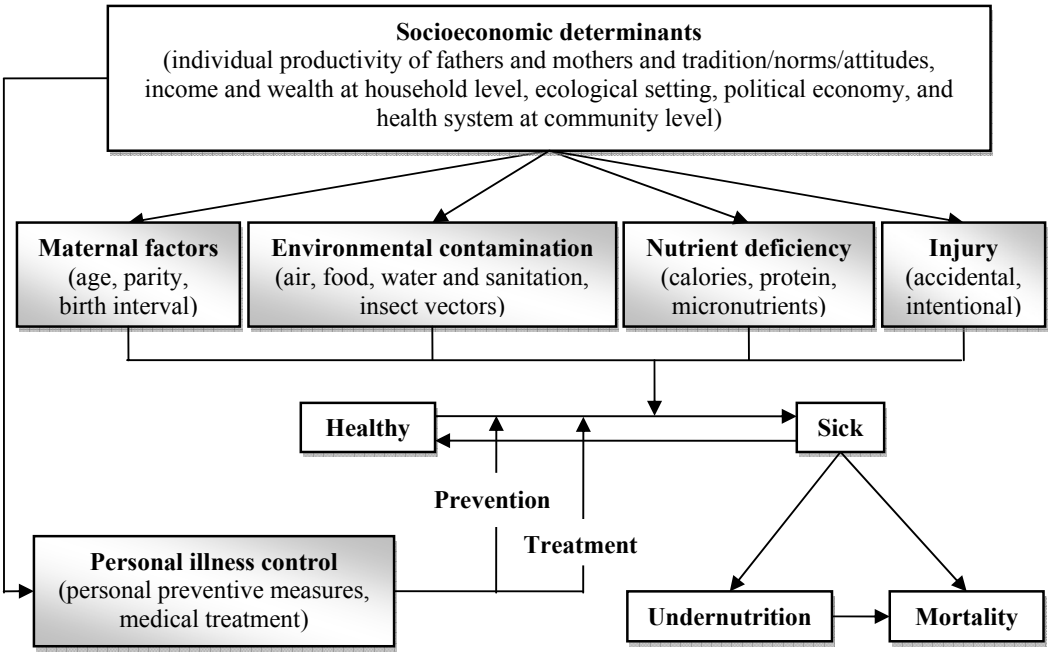

Figure 1: Mosley and Chen's analytical framework (Mosley & Chen, 1984: 29)

In 1984, Mosley and Chen proposed their framework (Figure 1) for studies of determinants of child survival in developing countries based on the premise that all socioeconomic determinants of child undernutrition and mortality necessarily operate through a common set of proximate factors. Based on the framework, they introduced a new "health status index" that integrates the levels of undernutrition among surviving children and mortality of the same cohort. This proposed index can be scaled among all children (surviving and deceased) and used as a dependent variable in studies dealing with determinants of child undernutrition or mortality (Mosley & Chen, 1984). It is represented by weight-for-age index with five categories as "dead," "severely undernourished," "moderately undernourished," "mildly undernourished," and "healthy." In order to assess significance of using weight-for-age index for the proposed "health status index," the authors undertook some prospective studies in Bangladesh, India, and New Guinea. In these studies, children's weights were measured at two different times and mortality rates were calculated by weight-for-age groups. As a summarized result, it was revealed that risk of dying increased consistently with lower weight-for-age index (Mosley & Chen, 1984).

However, according to a review of Mosley and Chen's analytical framework by Hill (2003), scientists have not paid much attention on the index even though it has potential to provide more categories than a dichotomous (alive/dead) one and to reduce the disciplinary gap between medical and social studies.

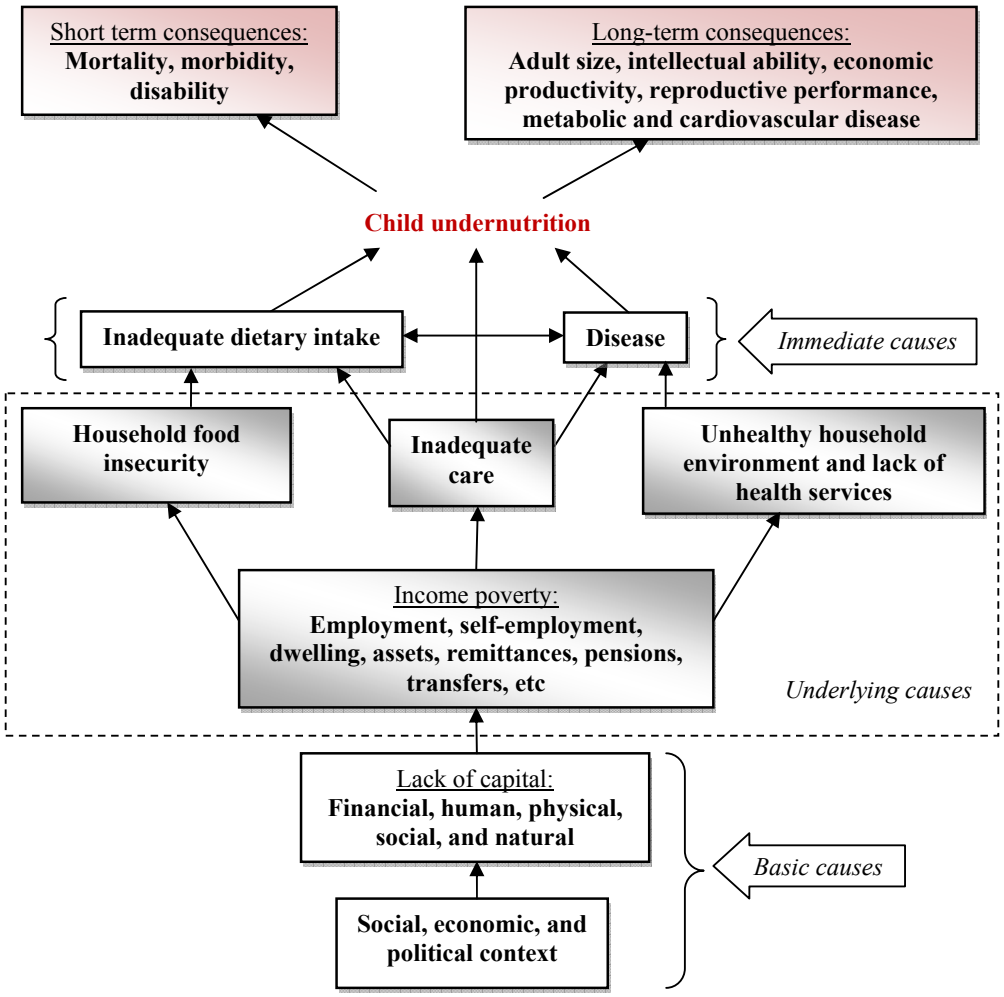

Figure 2: UNICEF's framework (Black et al., 2008: 6)

In 1998, United Nations Children's Fund (UNICEF) developed a framework (Figure 2) that illustrates basic and underlying causes and consequences of child undernutrition. This framework conveys a message that nutrition is not only about food since it includes poverty as basic cause and illustrates roles of environmental, economic, and sociopolitical factors (Black et al., 2008). The framework is adopted around the world as a guide for post-natal interventions to prevent and reduce child undernutrition and mortality resulting from undernutrition (UNICEF EAPRO, 2003).

Both theoretical frameworks illustrate that child undernutrition and mortality are likely to be influenced by a common set of immediate, underlying, and basic causes since child mortality is identified as an ultimate consequence of undernutrition (Mosley & Chen, 1984; Black et al., 2008).

Factors Affecting Children's Nutrition Status

In developing countries, socioeconomic determinants such as mother's characteristics, household environment, household wealth, and place of residence are basic and underlying factors of children's nutrition status (Mosley & Chen, 1984; UNICEF EAPRO, 2003).

It is well documented that children with high educated mothers are less likely to be undernourished due to their mothers' better ability to make appropriate decisions regarding health care practices, nutrition, hygiene, and disease treatment and prevention (Kabubo-Mariara, Ndenge, & Kirii, 2006; Mashal et al., 2008).

As for mother's working status, a several studies have found negative relationship with children's nutrition status in some African and South-Asian countries (Kandala, Lang, Klasen, & Fahrmeir, 2001; Mittal, Singh, & Ahluwalia, 2007).

It is almost as common knowledge that contaminated drinking water by bacteria and chemicals, suspension of water, and non-standard cleansing of water are the main causes of childhood infectious diseases such as diarrhea and pneumonia (Sanders et al., 2008) that are the diseases that lead to undernutrition among children in most cases (Girma & Genebo, 2002; Pongou, Ezzati, & Salomon, 2006).

Similarly, adequate sanitation facilities with vermin-proof screens, plumbing, and sewer connections and made by construction materials that can be cleaned easily are essential for keeping hygienic conditions in households (Pongou, Ezzati, & Salomon, 2006).

Furthermore, children who suffer from acute respiratory infections, which is the childhood disease mainly caused by poor ventilation inside houses (Oindo, Otieno, Okeyo, Olayo, Muga, & Kaseje, 2009), have a greater chance of being undernourished than those who are not exposed to the respiratory illnesses (Nandy, Irving, Gordon, Subramanian, & Smith, 2005).

A significantly strong positive relationship occurs between economic status of households and children's nutrition status. Apparently, when households have sufficient resources the household members are expected to enjoy household food security, opportunity of being high educated, and living in good household and community environment (Girma & Genebo, 2002; Mahgoub, Nnyepi, & Bandeke, 2006).

As for place of residence, households in poor economic strata are likely to be poor and children in those households are at high risk of being undernourished (Black et al., 2008).

Children with different demographic characteristics face different levels of undernutrition (Girma & Genebo, 2002).

According to many studies, many different patterns of age differentials in children's nutrition status are likely to be observed (Kumar, Goel, Mittal, & Misra, 2006).

Gender differentials in children's nutrition status can be evident in a society due to son preference, which has effects on food distribution, values and care of children, etc. Thus, it is likely to have no gender differentials in children's nutrition status in countries where son preference is not likely to happen (Girma & Genebo, 2002; Kabubo-Mariara, Ndenge, & Kirii, 2006; Singh & Grubesic, 2009).

Conceptual Frameworks

Based on the above theoretical frameworks and literature review, two conceptual frameworks were developed for this study.

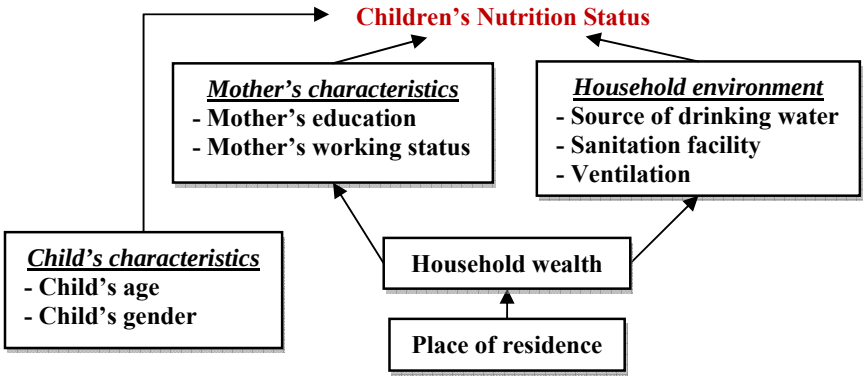

Figure 4: Factors affecting children's nutrition-mortality status

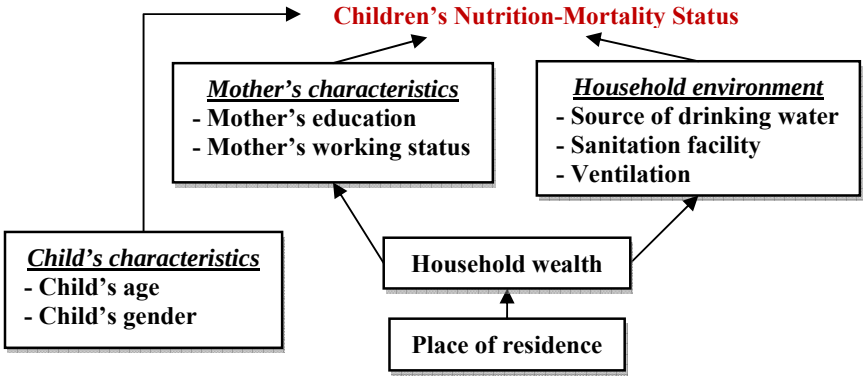

Figure 3: Factors affecting children's nutrition status

Methods

Data Source

The Kanchanaburi Demographic Surveillance System (KDSS) was designed to monitor population change by enumerating all households in 100 communities annually between 2000 and 2004 in Kanchanaburi province of Thailand (IPSR, 2007).

The sampling design of KDSS was stratified sampling. At first round (in 2000), all communities of the province were stratified into five economic strata: urban/semi urban, rice, plantation, uplands, and mixed economy. 20 communities were selected systematically from each economic stratum (in total, 100 communities). And then all households and household members were enumerated in each community. The sampling weights were calculated in the first round (in 2000) as inverse probability of selection for each stratum. In next rounds (in 2001, 2002, 2003, and 2004), new households, loss of households, and household members who died or moved out of the communities were identified easily with the help of village maps and household rosters that were built during baseline round in 2000 (IPSR, 2001; IPSR, 2007).

In each rounds, the annual village data were obtained through group interviews with village headmen and other leaders by field supervisors. The annual household and individual data were collected by conducting face-to-face interviews.

In 2003 and 2004, KDSS conducted anthropometric measurements (height and weight) of all household members who were at home during household interviews by using appropriate equipment. Respondents were asked to wear light clothing and take off shoes to step on dial scales with counselors that were located on flat surfaces. Interviewers then took notes of weights of respondents to nearest half kilogram. For height measurements, each respondent stood against a wall without shoes. Interviewers used stiff boards placed on individuals' heads to mark their heights on walls with pieces of chalks. A tape measure was then used to measure heights to nearest half centimeter from floor to chalk mark. For children under two who were not able to stand up against the wall and step on scale, interviewers recorded their heights and weights from children's health cards (Firestone, Peterson, Acevedo-Garcia, Punpuing, & Gortmaker, 2009).

Sample Selection

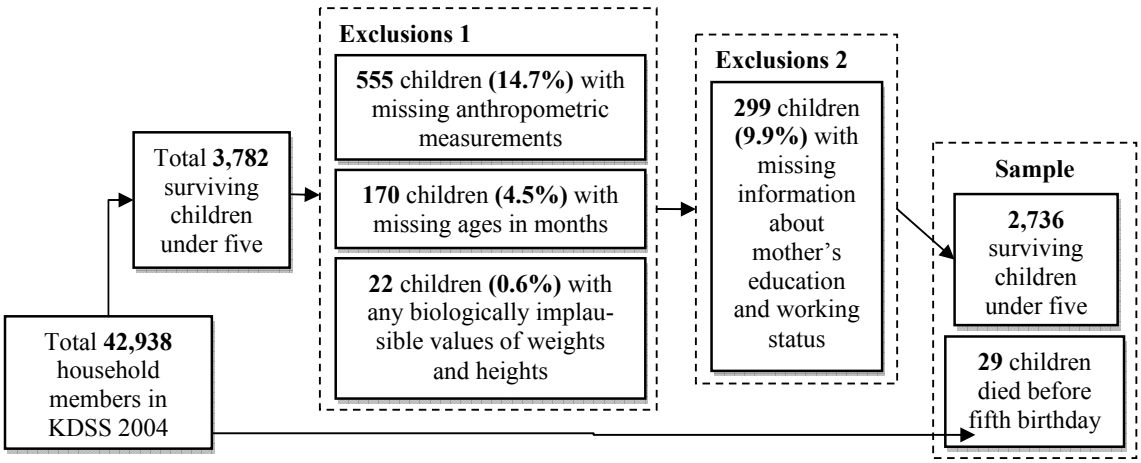

Figure 5: Sample selection from KDSS 2004

Operational Definitions of Dependent Variables

Table 1: Operational definitions of dependent variables

Dependent variables	Levels of measurement	Categories		Remarks
Children's nutrition status	Ordinal	1. Severely undernourished 2. Moderately undernourished 3. Mildly undernourished 4. Normal/over-nourished	It was scaled among surviving children	It was assumed that overnourished children are not likely to due to nutrition deficiency although they may have risk of developing health problems at later ages.
Children's nutrition-mortality status	Ordinal	0. Deceased 1. Severely undernourished 2. Moderately undernourished 3. Mildly undernourished 4. Normal/over-nourished	It combined nutrition status of surviving children with mortality status of deceased children	Nutrition status of surviving children was measured by weight-for-age index. The weight-for-age z-scores were estimated according to new Child Growth Standards (CGS) that has been released and recommended by WHO since 2006 (WHO, 2006) and by using SPSS Macro Program that was developed by WHO Anthro Team (Anthro = Anthropometric)

Operational Definitions of Independent Variables

Table 2: Operational definitions of independent variables

Independent variables	Levels of measurement	Categories	Remarks
Child's age	Ordinal	1. 0-5 months 2. 6-11 months 3. 12-23 months 4. 24-35 months 5. 36-47 months 6. 48-59 months	Ages in months were calculated for children whose birth dates and interview dates were recorded
Child's gender	Nominal	0. Female 1. Male	
Mother's education	Ordinal	0. No education 1. Primary education 2. Secondary or higher education	Primary – 1-6 years of education, Secondary or higher – 7 or higher years of education
Mother's working status	Nominal	0. Not working 1. Working	Not working mothers were those who had no employment or were housewives
Source of drinking water	Nominal	0. Inadequate 1. Adequate	Inadequate – rain water, tap water, water from natural source or shallow well, underground water Adequate – purchased/bottled drinking water

Table 2: Operational definitions of independent variables *(Continued)*

Independent variables	Levels of measurement	Categories	Remarks
Sanitation facility	Nominal	0. Inadequate 1. Adequate	Inadequate – squat type of toilet without septic tank, open pit or open fill or river Adequate – flush toilet, squat type of toilet with septic tank
Ventilation	Ordinal	0. Poor 1. Good	It was observed by interviewers
Household wealth	Ordinal	1. Poorest 2. Poor 3. Middle-income 4. Rich 5. Richest	It was measured by wealth index constructed using information about household characteristics and possessions by employing Principal Component Analysis (PCA) method
Place of residence	Nominal	1. Mixed economy 2. Uplands 3. Plantation 4. Rice 5. Urban/semi urban	It was classified reflecting different economic and land use patterns of the communities

Data Analysis

Descriptive statistics were employed in order to present the distribution of child undernutrition and mortality. Two separate Partial Proportional Odds Model (PPOM) (Williams, 2006) analyses were undertaken: one is with "children's nutrition status" as a dependent variable and the other is with "children's nutrition-mortality status." In each analysis, in order to decide whether Ordinal Logistic Regression Model (OLRM) or PPOM would be employed, Proportional Odds Assumption (POA), main underlying assumption of OLRM, was tested by Brant test for each independent variable. The POA assumes regression coefficients that describe a relationship between, for instance, lowest versus all higher categories of a dependent variable are the same as those that describe a relationship between next lowest categories and all higher categories, etc (Williams, 2006).

Demographic and Socioeconomic Characteristics of the Sample

After the exclusions shown in Figure 5, 2,765 children under five were analyzed. Of the total children, 99 per cent had been surviving by mid-2004, but one per cent was deceased. Less than half of the surviving children (44 per cent) had experienced undernutrition (Table 3). The percentage distribution of children's nutrition-mortality status is shown in Table 4.

Table 3: Percentage distribution of children's nutrition status by demographic and socioeconomic characteristics, KDSS 2004

Characteristics	Children's nutrition status				Total	
	Severely under-nourished	Moderately undernourished	Mildly under-nourished	Normal/ over-nourished	%	N
			*Child's age****			
0-5 months	8.8	9.6	28.1	53.5	100.0	**114**
6-11 months	6.4	9.8	18.6	65.2	100.0	**204**
12-23 months	6.2	8.4	21.1	64.4	100.0	**584**
24-35 months	3.0	13.3	29.0	54.8	100.0	**566**
36-47 months	5.5	11.6	28.7	54.2	100.0	**638**
48-59 months	3.2	14.3	33.8	48.7	100.0	**630**
			Child's gender			
Female	4.7	12.8	26.1	56.4	100	**1,333**
Male	4.9	10.5	28.9	55.7	100.0	**1,403**
			*Mother's education****			
No education	8.0	21.0	35.1	36.0	100.0	**439**
Primary education	4.7	12.2	29.6	53.5	100.0	**1,476**
Secondary or higher education	3.2	5.7	19.7	71.4	100.0	**821**
			*Mother's working status****			
Not working	7.3	12.8	28.1	51.8	100.0	**893**
Working	3.6	11.1	27.2	58.1	100.0	**1,843**
			*Source of drinking water****			
Inadequate	5.4	13.1	29.2	52.3	100.0	**2,276**
Adequate	1.7	4.6	19.1	74.6	100.0	**460**
			*Sanitation facility****			
Inadequate	10.1	22.2	31.3	36.4	100.0	**198**
Adequate	4.4	10.8	27.2	57.6	100.0	**2,538**
			Ventilation			
Poor	4.8	12.9	25.8	56.5	100.0	**356**
Good	4.8	11.5	27.8	56.0	100.0	**2,380**
			*Household wealth****			
Poorest	9.7	21.5	33.4	35.4	100.0	**554**
Poor	4.8	14.8	31.5	48.9	100.0	**546**
Middle-income	4.5	9.5	28.0	58.1	100.0	**539**
Rich	3.2	7.6	27.2	62.0	100.0	**537**
Richest	1.8	4.8	17.7	75.7	100.0	**560**
			*Place of residence****			
Mixed economy	4.3	10.5	25.9	59.3	100.0	**513**
Uplands	7.3	17.7	32.3	42.7	100.0	**906**
Plantation	4.2	10.8	27.6	57.4	100.0	**406**
Rice	3.8	7.9	27.5	60.8	100.0	**444**
Urban/semi urban	1.9	5.6	19.9	72.6	100.0	**467**
Total	**4.8**	**11.7**	**27.5**	**56.0**	**100.0**	**2,736**

Note: *** Pearson Chi-square value is significant at $p \leq 0.001$

Table 4: Percentage distribution of children's nutrition-mortality status by demographic and socioeconomic characteristics, KDSS 2004

Characteristics	Children's nutrition-mortality status					Total	
	Deceased	Severely under-nourished	Moderately under-nourished	Mildly under-nourished	Normal/ over-nourished	%	N
			*Child's age****				
0-5 months	2.6	8.5	9.4	27.4	52.1	100.0	**117**
6-11 months	0.5	6.3	9.8	18.5	64.9	100.0	**205**
12-23 months	0.3	6.1	8.4	21.0	64.2	100.0	**586**
24-35 months	0.7	3.0	13.2	28.8	54.4	100.0	**570**
36-47 months	1.1	5.4	11.5	28.4	53.6	100.0	**645**
48-59 months	1.9	3.1	14.0	33.2	47.8	100.0	**642**
			Child's gender				
Female	0.9	4.6	12.7	25.9	55.9	100.0	**1,345**
Male	1.2	4.9	10.4	28.5	55.0	100.0	**1,420**
			*Mother's education****				
No education	2.9	7.7	20.4	34.1	35.0	100.0	**452**
Primary education	0.7	4.7	12.1	29.4	53.1	100.0	**1,486**
Secondary or higher education	0.7	3.1	5.7	19.6	70.9	100.0	**827**
			*Mother's working status****				
Not working	1.7	7.2	12.6	27.6	51.0	100.0	**908**
Working	0.8	3.6	11.0	27.0	57.6	100.0	**1,857**
			*Source of drinking water****				
Inadequate	1.1	5.3	12.9	28.9	51.7	100.0	**2,302**
Adequate	0.6	1.7	4.5	19.0	74.1	100.0	**463**
			*Sanitation facility****				
Inadequate	3.4	9.8	21.5	30.2	35.1	100.0	**205**
Adequate	0.9	4.3	10.7	27.0	57.1	100.0	**2,560**
			Ventilation				
Poor	1.1	4.7	12.8	25.6	55.8	100.0	**360**
Good	1.0	4.7	11.4	27.5	55.4	100.0	**2,405**
			*Household wealth****				
Poorest	2.8	9.5	20.9	32.5	34.4	100.0	**570**
Poor	0.7	4.7	14.7	31.3	48.5	100.0	**550**
Middle-income	0.4	4.4	9.4	27.9	57.9	100.0	**541**
Rich	0.9	3.1	7.6	26.9	61.4	100.0	**542**
Richest	0.4	1.8	4.8	17.6	75.4	100.0	**562**
			*Place of residence****				
Mixed economy	0.6	4.3	10.5	25.8	58.9	100.0	**516**
Uplands	2.3	7.1	17.3	31.6	41.7	100.0	**927**
Plantation	0.0	4.2	10.8	27.6	57.4	100.0	**406**
Rice	0.7	3.8	7.8	27.3	60.4	100.0	**447**
Urban/semi urban	0.4	1.9	5.5	19.8	72.3	100.0	**469**
Total	**1.0**	**4.7**	**11.5**	**27.2**	**55.4**	**100.0**	**2,765**

Note: *** Pearson Chi-square value is significant at $p \leq 0.001$

Findings

Factors Affecting Children's Nutrition Status

When the POA was tested for each independent variable, it was revealed that only child's age did not meet the assumption. Therefore, a Partial Proportional Odds Model (PPOM) rather than OLRM was used. As a result, the following models that differ only by the different constants and regression coefficients, odds ratios, and standard errors of child's age were needed for each pair of the categories of the dependent variable.

Table 5: Regression coefficients, odds ratios, and standard errors of PPOM for children's nutrition status by factors affecting, KDSS 2004

Children's nutrition status	B	SE	OR	SE	Sig.
Being moderate or mild undernourished or normal/over-nourished *versus* being severe undernourished					
Mother's education	0.2965	0.070	1.3451	0.095	***
Mother's working status	0.1772	0.085	1.1939	0.101	*
Source of drinking water	0.4049	0.128	1.4992	0.193	**
Sanitation facility	0.2040	0.147	1.2264	0.181	
Ventilation	0.0573	0.115	1.0590	0.122	
Household wealth	0.2603	0.036	1.2973	0.046	***
Place of residence	0.0622	0.032	1.0641	0.034	
Child's age	0.1731	0.060	1.1890	0.071	**
Child's gender	0.0195	0.076	1.0197	0.078	
Constant	0.7471	0.307			
Being mild undernourished or normal/over-nourished *versus* being moderate or severe undernourished[1]					
Child's age	-0.1981	0.050	0.8203	0.041	***
Constant	0.1391	0.246			
Being normal/over-nourished *versus* being mild, moderate or severe undernourished[1]					
Child's age	-0.3277	0.059	0.7206	0.042	***
Constant	-0.8139	0.223			

Note: $N = 2,730$, $Pseudo\ R^2 = 0.0350$, $LR\ chi2(11) = 327.4^{***}$, $^{***}p \leq 0.001$

*** $p \leq 0.001$, ** $p \leq 0.01$, * $p \leq 0.05$

[1] *Other independent variables have the same regression coefficients, odds ratios, and standard errors as in the first pair of the categories of the dependent variable*

According to Table 5, it was revealed that mother's education, mother's working status, source of drinking water, and household wealth have significant positive influences on children's nutrition status while child's age has a significant

negative influence. But sanitation facility, ventilation, place of residence, and child's gender have no statistically significant influences on children's nutrition status.

Factors Affecting Children Nutrition-Mortality Status

Again, in this analysis, only child's age did not meet the assumption while all other independent variables did after the POA was tested for each independent variable. Thus, the models in Table 6 that differ only by the different regression coefficients, odds ratios, and standard errors of child's age and constants were needed for each pair of the categories of the dependent variable.

Mother's education, mother's working status, source of drinking water, household wealth, and place of residence have positive statistically significant effects on children's nutrition-mortality status. But, sanitation facility, ventilation, child's age (in overall), and child's gender are turned out to be non-significant factors of children's nutrition-mortality status.

Table 6: Regression coefficients, odds ratios, and standard errors of PPOM for children's nutrition-mortality status by factors affecting, KDSS 2004

Children's nutrition-mortality status	B	SE	OR	SE	Sig.
Being severe, moderate, or mild undernourished or normal/over-nourished *versus* dying					
Mother's education	0.2975	0.070	1.3465	0.094	***
Mother's working status	0.2004	0.084	1.2218	0.103	*
Source of drinking water	0.3851	0.127	1.4698	0.187	**
Sanitation facility	0.2503	0.145	1.2844	0.186	
Ventilation	0.0593	0.114	1.0611	0.121	
Household wealth	0.2634	0.035	1.3013	0.046	***
Place of residence	0.0658	0.032	1.0680	0.034	*
Child's age	-	0.140	0.8109		
	0.2097			0.113	
Child's gender	0.0052	0.076	1.0053	0.076	
Constant	3.8924	0.694			
Being moderate or mild undernourished or normal/over-nourished *versus* being severe undernourished or dying					
Child's age	0.3210	0.130	1.3785	0.179	*
Constant	0.7266	0.297			
Being normal/over-nourished *versus* being mild, moderate, or severe undernourished or dying[1]					
Child's age	0.1724	0.137	1.1882	0.162	
Constant	0.0639	0.242			

Table 6: Regression coefficients, odds ratios, and standard errors of PPOM for children's nutrition-mortality status by factors affecting, KDSS 2004 *(Continued)*

Children's nutrition-mortality status	B	SE	OR	SE	Sig.
Being mild undernourished or normal/over-nourished *versus* being moderate or severe undernourished or dying[1]					
Child's age	0.0503	0.139	1.0516	0.147	
Constant	-0.8852	0.221			

Note: $N = 2,765$, $Pseudo\ R^2 = 0.0337$, $LR\ chi2(12) = 343.6^{***}$, $^{***}p \leq 0.001$

*** $p \leq 0.001$, ** $p \leq 0.01$, * $p \leq 0.05$

[1] *Other independent variables have the same regression coefficients, odds ratios, and standard errors as in the first pair of the categories of the dependent variable*

Comparison between the Factors Affecting in the PPOMs

When significance of independent variables in both PPOMs are compared (Table 7), it can be seen that place of residence was turned to be a significant factor for children's nutrition-mortality status although it was not so for children's nutrition status. At the same time, child's age turned out to be a non-significant factor for children's nutrition-mortality status.

Finally, the factors affecting children's nutrition status are not exactly the same as the factors affecting children's nutrition-mortality status. However, there are several other common factors such as mother's education, mother's working status, source of drinking water, and household wealth.

Table 7: Comparison between factors affecting in the PPOMs for children's nutrition status and children's nutrition-mortality status, KDSS 2004

Factors	Children's nutrition status	Children's nutrition-mortality status	Comparison
Mother's education	***	***	same
Mother's working status	*	*	same
Source of drinking water	**	**	same
Sanitation facility			same
Ventilation			same
Household wealth	***	***	same

Table 7: Comparison between factors affecting in the PPOMs for children's nutrition status and children's nutrition-mortality status, KDSS 2004 *(Continued)*

Factors	Children's nutrition status	Children's nutrition-mortality status	Comparison
Place of residence		*	different
Child's age	**		different
Child's gender			same

Note: *** $p \leq 0.001$, ** $p \leq 0.01$, * $p \leq 0.05$

Discussions and Conclusions

In this study, the rationale of integrating undernutrition and mortality into one dependent variable was the theory that child mortality is an ultimate consequence of undernutrition and factors affecting child undernutrition and mortality are common to each other in most developing countries such as Thailand. Therefore, if the factors affecting children's nutrition-mortality status are the same as the factors affecting children's nutrition status, it can imply that the study provides a conceptual proof for the theory.

According to the comparison between factors affecting in the PPOMs, it was revealed that the factors affecting children's nutrition status are not exactly the same as the factors affecting children's nutrition-mortality status. From this result, one may conclude against the theory that child undernutrition does not ultimately cause mortality and factors affecting child undernutrition and undernutrition-mortality are not common to each other in KDSS context.

However, it was also revealed that both children's nutrition status and children's nutrition-mortality status are likely to be influenced by several other common factors such as mother's education, mother's working status, source of drinking water, and household wealth. Thus, in this case, concluding against the theory might be too strong.

Finally, considering the above discussions, the results of this study suggest a conceptual proof for the theory in KDSS context although there were some limitations.

The main limitations were, firstly, very little number of deceased children, secondly, no proximate factor such as maternal factors, dietary intake, and childhood diseases, those are more likely to determine children's nutrition status, were not

included here due to limitations of using secondary data, and thirdly, no proper information on causes of deaths were available.

Recommendations for Further Research

In order to overcome the obstacle of very little number of deceased children, further studies with the similar methodologies should be undertaken with high mortality among children under five. But it is necessary to exclude children who did not die due to undernutirion before their fifth birthday.

In addition, inclusions of other important factors are necessary. Particularly, maternal factors such as age at birth, parity, and birth interval, experience of childhood infectious diseases such as diarrhea and pneumonia, deficiencies in calories, proteins, and micronutrients, immunization and vitamin A supplementation, source of drinking water for only children's needs, and accessibility to primary health care are more likely to determine children's nutrition status.

Mosley and Chen (1984) argued that integrating undernutrition and mortality into one dependent variable may have potential to strengthen explanatory power of the factors affecting child survival. In order to challenge this argument, one needs to conduct a very comprehensive data analysis, not only a comparison between the factors affecting children's nutrition status and children's nutrition-mortality status. For instance, the levels of influences of the factors have to be compared if all factors in each model are significant and several different research methods should be employed for suggesting very precise empirical evidence.

As mentioned earlier, the findings from this study suggest a conceptual proof for the theory, not empirical evidence. Therefore, longitudinal studies that measure children's nutrition status at consecutive years and assess risks of dying due to undernutrition are necessary to prove the theory empirically.

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Impact of Mass Media on Antenatal Care (ANC) Utilization in Bangladesh

Md. Firoz Uddin

Abstract

The study examines the net impact of exposure to mass media (TV, radio, and newspaper) on antenatal care (ANC) utilization of pregnant mothers in Bangladesh. To find out the impact of mass media as a programmatic factor, other independent variables such as demographic, socio-economic, and community factors have been considered as control variables. The dependent variable ANC is divided into two categories, use and non use. The study utilized secondary data from the Bangladesh Demographic and Health Survey (BDHS) 2004 which included 5,408 mothers who gave live birth during the five years preceding the survey. The ANC use has been considered only for the most recent birth.

The result shows that 56 percent of pregnant mothers received antenatal care at least once from a trained or untrained provider. Among mothers, 68 percent have access to any mass media (TV 8%, radio 30%, and newspaper 30%). Bivariate analysis shows that TV and radio along with other variables have significant impact on ANC utilization, all except mother's occupation. Binary logistic regression shows that the impact of exposure to TV and radio in using ANC is statistically significant after controlling for other variables. That means mothers who were exposed to TV and radio were more likely to use ANC than mothers who were not exposed to TV and radio. It proves that TV and Radio has a strong role in using ANC.

So, in order to reduce maternal mortality, an up-to-date and attractive maternal health care programme should be broadcast through national mass media, especially by TV and Radio. Additionally, based on this study, policy makers and planners should consider mass media (as a key role player to motivate mothers in seeking maternal health services) in formulating plans and programmes to improve the maternal health of women at reproductive ages in Bangladesh.

Keywords: Impact/Mass Media /Antenatal Care (ANC)/ Pregnant Women /Maternal Mortality/Maternal Health / Bangladesh

Introduction

MCH in Bangladesh

Maternal and Child Health activities in Bangladesh have a long history which was started in the mid-forties. Institutionally it was started during 1952-1953. Between 1961 and 1971, 152 rural health centers (RHCs) were established, with few beds and facilities.

In 1975 MCH services were integrated with the health services in order to increase wider adoption of family planning, and a combined approach was adopted at the same time. The integrated approach promoted the construction of facilities at the union (below thana level) and thana levels, utilization of traditional birth attendants (TBAs) for integrated MCH-FP activities, training of family welfare assistants (FWAs) for MCH work, and an accelerated training program for family welfare visitors (FWVs). Later on the previous RHCs converted to thana health complexs (THCs), and numbers of new facilities were built. After 1980s number of satellite clinics also established, which were started in the late eighty's. These satellite clinics, THCs supported by MCWCs, and district hospitals were the main providers of MCH services. Below thana level, FWCs provided basic MCH care, and the FWVs provided technical support to the TBAs and FWAs for community-based MCH services. Rural populations at ward and village levels were covered by the services of FWAs, TBAs, and satellite clinics (NIPORT, 2003).

In the 1970s, TBAs handled most home deliveries, so the government took the initiative at that time to train these TBAs, who had generally not received any previous training in hygiene or proper delivery practices. The TBA training project trained women across the entire country, with the goal of providing one trained TBA for each of the villages of the country. Despite this training, it was found that many negative and harmful practices continued especially among untrained TBAs (Akhter et al., 1995). It was also found that there was no significant decline in maternal mortality. It was because of that, though numbers of TBAs were trained; only six percent of births were delivered by them. Inadequate supervision and support, insufficient practical experiences, and improper referrals for the patients who were identified complicated and required proper treatment (Chowdhury et al., 2002).

In the early 1990s, an immediate response to the new initiative was taken with many ongoing programs like Fourth Population and Health Program (FPHP) 1992-1998: adopting an emergency obstetric care (EOC) approach. A Pilot Project was initiated for the Development of Maternal and Neonatal Health Care supported by the World Health Organization (WHO). At the same time, the UNFPA supported the Strengthening of Maternal and Child Welfare Centres (MCWCs) project, and the European Union supported the Thana Functional Improvement Pilot Project (TFIPP). These formerly underutilized facilities, staffed predominantly by females, showed a dramatic increase in most EOC indicators—antenatal care (ANC), delivery care, C-sections, postnatal care (PNC), treatment of complications, and clinical contraception. At the same time, MOHFW in collaboration with Obstetrics and Gynaecology Society

of Bangladesh (OGSB) and UNICEF in 1993 initiated another pilot project called Strengthening of EOC Services in 11 Districts of Bangladesh, which commenced in 1994 with a series of advocacy workshops organized at the national and district levels. The objectives of this project included establishing 1) comprehensive EOC facilities at district hospitals, 2) basic EOC facilities at THCs, and 3) obstetric first aid facilities at health and family welfare centers (HFWCs) and MCWCs. Another objective was to formulate a proposal for a national plan of action for reducing maternal mortality through provision of EOC services (NIPORT, 2003).

In the late 1990s a sector-wide programme approach namely "Health and Population Sector Programme (HPSP 1998-2003)" (MOHFW, 1998) was initiated including all projects. During this period a ten years strategy namely "Bangladesh National Strategy for Maternal Health" was prepared by the Ministry (MOHFW, 2001). According to the strategy and considering the then situation of maternal health services as a crucial area, some additional and up-to-date programmes had been incorporated in the MOHFW's new gigantic programme 'Health, Nutrition and Population Sector Programme (HNPSP 2003-2011)-Reviseed' (MOHFW, 2008). Under this programme many new facilities have been established and existing facilities will be renovated. New appointment of service providers, training of regular staff have been incorporated in this program for quality MCH in Bangladesh.

Rationale of the study

Bangladesh is a developing country with a population of about 150 million, making it one of the densely populated countries of the world and facing many challenges regarding its big volume of population. At present the population density is more than 1000 people per square kilometer (BBS, 2007). Life expectancy at birth is 65 years. Maternal mortality ratio (MMR) is 320 per 100,000 live births and infant mortality rate (IMR) 65 per 1,000 live births (NIPORT, 2005). Maternal and child health care (MCH) services have direct influence and impact both on MMR and IMR. Among major three maternal cares antenatal (prenatal) care (ANC), has a vital role in reducing deaths of mothers and children.

Maternal health care is a concept that includes family planning, preconception, antenatal care, delivery care, and postnatal care. Antenatal care is the comprehensive care that women receive and provide for themselves throughout their pregnancy. Widely, ANC can be assessed according to the type of service provider, the number of visits made, the stage of pregnancy at the time of first visit, and services and information received during pregnancy (NIPORT, 2005). Women who begin antenatal care early in their pregnancies have better birth outcomes than women who receive little or no care during their pregnancies.

The country has been made remarkable progress over the last three decades in the field of maternal health. However, of the 171 countries included in a recent joint review of maternal mortality ratio (MMR) estimates for 2000 by WHO, UNICEF and UNFPA (2001), 51 countries (30 percent) had higher levels of maternal mortality than Bangladesh – some three to five times higher. The trend data also show an encouraging reduction of the MMR in Bangladesh of 22 percent over the past 15

years. Although MMR declined 22% over the past 15 years, Bangladesh still having relatively high mortality ratio in the world (NIPORT, 2003).

The Nairobi Safe Motherhood Conference in 1987, focused on the imperative of making childbearing safer, the philosophy of service provision has evolved from the "risk" approach to the "three delays" approach. The three delays include: 1) deciding to seek care of the pregnant woman, 2) reaching the medical facility, and 3) receiving adequate treatment at the facility. The three delays approach accepts that all pregnancies are potentially at risk of complications and that all arrangements need to be set in place to ensure that those pregnancies that do developed complications receive appropriate care.

The existing high MMR represents the annual loss of 12,000 women from maternity-related causes. The loss of such a volume of mothers per year is a very crucial matter not only for those affected families but also has a negative impact in the economy, culture, and in the society. That is why targeting to reducing mortality, maternal care especially antenatal care has been taken into consideration as an important factor in Bangladesh (NIPORT, 2003).

The national maternal health strategy of Bangladesh recommends that all pregnant women should make three or more antenatal visits to a medically trained or skilled provider, and the first visit should take place within the first trimester of pregnancy. However, about half of all pregnant women made only one ANC visit in 2000 (MOHFW, 2001).

In Bangladesh, like other parts of the world, receiving antenatal care is strongly associated with different socio-economic, demographic, cultural/community, and programme factors. Many programmes through government and non-government channels are being advocated regarding maternal health services to reduce maternal and child deaths. The mass media (newspapers, radio and TV) have been playing a significant role through their different programmes. Most of the medias' are to follow the government charter to disseminate health programs regularly (DGFP, 2007). This study aims to determine whether and how the exposure to mass media are associated with using antenatal cares of pregnant mothers. Finally, the study will attempt to specify and distinguish the net impact of exposure to mass media on antenatal care utilization. The findings of this study may be helpful for policy makers/planners and programme managers in formulating in formulating future plans and programs to improve the maternal health in Bangladesh.

Research Question

Whether and how mass media has any impact on antenatal care (ANC)?

Objective

The objective is to measure the impact of mass media on antenatal care (ANC) utilization.

Data Source and Methodology

This study used secondary data of the Bangladesh Demographic and Health Survey (BDHS) 2004, which was conducted by the National Institute of Population Research and Training (NIPORT). The BDHS 2004 is a nationally representative survey of 11,440 women age 10-49 years and 4,297 men age 15-54 years from 10,500 household covering 361 sample points throughout Bangladesh, 122 in urban areas and 239 in the rural areas. The survey was conducted using multistage clustering sample based on the 2001 Bangladesh census including all six divisions of the country. Data was collected during January to May 2004. The purpose of this study is to identify the impact of mass media and role of socio-demographic factors in seeking antenatal care. Therefore the unit of analysis is mothers aged 15-49 years from the DHS survey, who gave birth within last five years of the study. A total of 5,408 mothers gave birth during that period, has been used as total number of population for this study.

The dependent variable of this study is antenatal care utilization by the pregnant mothers which is measured as dichotomous outcomes, use and not use. Independent variables are grouped into 4 categories: demographic variables (age, place of residence, number of children), socio-economic variables (parent's education, mother's occupation, household income level), cultural/community variables (religion, distance to health facilities) and programmatic variables (mass media: TV, radio and newspaper).

To analyze the data, frequency distribution and descriptive statistics have been used to explore the background characteristics of the sample population, such as demographic, socio-economic, and cultural/community factors, as well as level of receiving antenatal care. Bivariate analysis, cross-tabulation and chi-square test, were applied to examine the association between independent variables and dependent variables. The logistic regression analysis was performed to measure the net effect of independent variables on dependent variable with dichotomous outcomes: use of antenatal care (yes vs no).

Results and Discussion

Univariate analysis

Background characteristics of mothers

Table 1 shows that majority of the mothers (73%) are in the age group of 25-34 years. In case of place of residence four-fifth of the mothers (79%) are from urban areas. Those women who have 1-2 children represents the highest percentage (58%) followed by the children of 3 or more group (41%). More than one-third mothers have no education (37%) while more than half mothers (58%) completed primary and secondary level of education. However, only 5 percent of mothers have higher level of education. Four out of five mothers (82%) are house wife. On the other hand, one out of eight (12%) mothers is engaged in non-agriculture jobs followed by one in sixteen mothers (6%) in the agriculture sector. Two in five (39%) husbands are not educated

whereas half (50%) have completed primary and secondary education followed by one in ten (10%) higher educated. In case of household income status, the highest percent of respondents (24%) are from poorest household's group. On the other hand, respondents from the richest household's group represent the lowest percentage (17%) among all respondents. The overwhelming majority of the respondents are Muslims (92%) and remaining 8% are from different religions (Hindu, Buddhist, Christians, etc.). Regarding distance of health facilities, four out of five (80%) respondents live within 2 kilometers diameter of the nearest health facilities followed by 17% within 2-4 kilometers and 3% more than 4 kilometers of the health facilities.

Exposure to mass media (TV, radio, and newspaper) of the respondents has been considered as an important factor in this study. Mass media exposure is very low among the respondents. For example, only one in twelve watches TV (8%), three in ten (30%) listen to radio and the same percent (30%) of respondents read newspapers.

Table 1: Number and percentage distribution of respondents by socio-demographic Characteristics

Characteristics	Number	Percent
Age of mothers (years)		
15-24	928	17.2
25-34	3920	72.5
35-49	560	10.4
Total	5408	100.0
Place of residence		
Rural	1120	20.7
Urban	4288	79.3
Total	5408	100.0
No of living children		
No child	80	1.5
1-2 child	3127	57.8
3 or more	2202	40.7
Total	5408	100.0
Mother's educational level		
No education	1993	36.8
Primary	1642	30.4
Secondary	1484	27.4
Higher	290	5.4
Total	5408	100.0
Mother's occupation		
No occupation	4410	81.5
Agriculture	315	5.8
Non agriculture	683	12.6
Total	5408	100.0

Table 1: Number and percentage distribution of respondents by socio-demographic Characteristics *(Continued)*

Characteristics	Number	Percent
Husband's education		
No education	2129	39.4
Primary	1457	26.9
Secondary	1292	23.9
Higher	531	9.8
Total	5408	100.0
Household's Income Status		
Poorest	1296	24.0
Poorer	1120	20.7
Middle	1054	19.5
Richer	997	18.4
Richest	941	17.4
Total	5408	100.0
Religion/Ethnicity		
Non Muslims	441	8.1
Muslims	4968	91.9
Total	5408	100.0
Distance to health facility		
Less than 2 Kilometer	4300	79.5
2-4 Kilometer	923	17.1
More than 4 Kilometer	185	3.4
Total	5408	100.0
Exposure to Mass media		
Watching TV		
No	4959	91.7
Yes	450	8.3
Total	5408	100.0
Listening radio		
No	3800	70.3
Yes	1608	29.7
Total	5408	100.0
Reading newspaper		
No	3770	69.7
Yes	1638	30.3
Total	5408	100.0

Antenatal care utilization

Among the total respondents of this study, 56% of mothers received at least one ANC whereas 44% of the mothers did not receive any ANC during their last pregnancy (Figure 1).

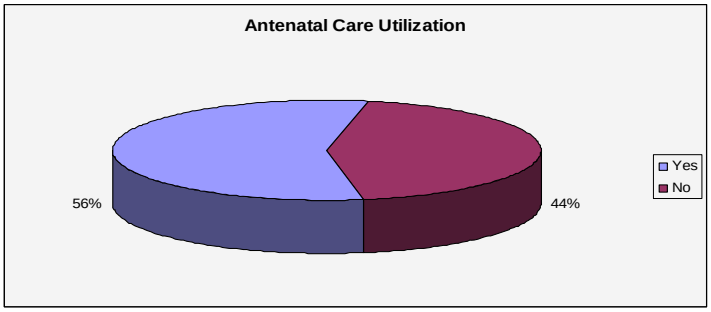

Figure 1: Percentage distribution of respondents according to antenatal care utilization.

Bivariate analysis

Demographic characteristics

Table 2 presents the relationship between demographic characteristics and antenatal care (ANC) utilization. It is found that the percentage of respondents utilized ANC services varied with different demographic characteristics. In regards to age group, around three-fifths of mothers (59% and 57%) of younger and middle age groups 15-24 and 25-34 respectively received ANC, where only two-fifths of mothers (43%) aged 35-49 receive ANC. In regards to place of residence, percentage of respondents (75%) using ANC in urban area is 24 percentage point higher than the mothers (51%) living in rural areas. Percentage of using ANC by mothers with no living children and 1-2 children are higher (68% and 62%) than mothers with more than 3 living children (47%).

Chi-square test has been done to find out the association between independent and dependent variables. It is notable that the entire demographic variables have significant association with ANC utilization. That means more women of lower age groups were significantly used ANC compared to mothers of high age groups. Similarly more mothers living in urban areas were significantly used ANC compared to mothers living in rural areas, and, more mothers with no child were significantly used ANC than mothers having one or more children.

Table 2: Percentage distribution of pregnant mothers by ANC utilization and Demographic characteristics

Demographic characteristics	ANC Utilization			Grand	χ^2
	Yes (%)	No (%)	Total (%)	Total (N)	
Age of mothers (years)					
15-24	59.3	40.7	100.0	928	44.8***
25-34	57.0	43.0	100.0	3920	
35-49	42.9	57.1	100.0	560	
Place of residence					
Rural	51.0	49.0	100.0	4288	205.3***
Urban	74.9	25.1	100.0	1120	
No of Living children					
No child	68.3	31.7	100.0	80	
1-2 child	62.0	38.0	100.0	3127	123.9***
3 or more	46.9	53.1	100.0	2202	
Total	**55.9**	**44.1**	**100.0**	**5408**	

*Note: ***p<.001*

Socio-economic characteristics

Table 3 shows the relationship between socio-economic characteristics and antenatal care (ANC) utilization. It is observed that the percentage of respondents who experienced pregnancy and used ANC varied by different socio-economic characteristics. Regarding level of mother's education, only less than two-fifths of non educated mothers (38%) are receiving ANC, where almost all mothers (97%) with higher education receiving ANC. By occupation of mothers, percentage of mothers with no occupation receiving ANC is 57%, whereas percentage of mothers involved in agriculture and non-agriculture receiving ANC a little bit lower (53% both). On the other hand, percentage of mothers with highly educated husbands using ANC double (86%) than the percent of mothers with husband's no education (43%). Similarly, percent of mothers (84%) from the highest income level of households using ANC is very high compared as mothers from poorest households (34%).

Chi-square test shows very significant association with the mother's educational level (p<.001), husband's education (p<.001), and household's income status (p<.001). This means that women with higher education, with higher education of their husbands, and from high level of household income are more utilization to ANC. However, the result does not show significant association between the mother's occupation and utilizing ANC.

Table 3: Percentage distribution of pregnant mothers by ANC utilization and Socio-economic characteristics

Socio-economic characteristics	ANC Utilization			Grand	χ^2
	Yes (%)	No (%)	Total (%)	Total (N)	
Mother's educational level					
No education	37.7	62.3	100.0	1993	
Primary	54.9	45.1	100.0	1642	652.5***
Secondary	73.6	26.4	100.0	1484	
Higher	96.7	3.3	100.0	290	
Mother's occupation					
No occupation	56.6	43.4	100.0	4410	4.1
Agriculture	52.8	47.2	100.0	315	
Non agriculture	53.2	46.8	100.0	683	
Husband's education					
No education	43.2	56.8	100.0	2129	
Primary	52.4	47.6	100.0	1457	425.2***
Secondary	68.6	31.4	100.0	1292	
Higher	85.9	14.1	100.0	531	
Household's Income Status					
Poorest	33.8	66.2	100.0	1296	
Poorer	45.9	54.1	100.0	1120	658.6***
Middle	58.5	41.5	100.0	1054	
Richer	66.5	33.5	100.0	997	
Richest	84.3	15.7	100.0	941	
Total	**55.9**	**44.1**	**100.0**	**5408**	

*Note: ***p<.001*

Community characteristics

Table 4 shows the relationship between community characteristics and antenatal care (ANC) utilization. In regards to religion, more than three-fifths (65%) of non Muslim mothers use ANC while only 55% Muslim respondents utilize ANC. Regarding distance to health facilities, more than half respondents (57%) who are living within 2 kilometers of health facilities than those who live more than 4 kilometers (48%) utilize ANC.

Chi-square test result shows both the community level variables have significant association (p<.001) with ANC utilization. That means women from Muslim community were significantly less used ANC compared to non-Muslim mothers and mothers living nearer to health facilities significantly more used ANC than the mothers who are living far away from health facilities.

Table 4: Percentage distribution of pregnant mothers by ANC utilization and Community characteristics

Community characteristics	ANC Utilization			Grand	χ^2
	Yes (%)	No (%)	Total (%)	Total (N)	
Religion/Ethnicity					
Non Muslims	64.8	35.2	100.0	441	15.5***
Muslims	55.1	44.9	100.0	4968	
Distance to health facility					
Less than 2 Kilometer	57.4	42.6	100.0	4300	18.4***
2-4 Kilometer	50.7	49.3	100.0	923	
More than 4 Kilometer	48.3	51.7	100.0	185	
Total	**55.9**	**44.1**	**100.0**	**5408**	

*Note: ***p<.001*

Programme factors/characteristics

Table 5 presents effect of exposure to mass media on antenatal care (ANC) utilization. It is found that the percentage of respondents who experienced pregnancy and used ANC varied by different programmatic characteristics i.e. exposure to different mass media (TV, radio, and newspapers/magazines). The result shows that the increase in exposure to mass media increases the use of antenatal care. For instance, the utilization of ANC by mothers who are exposure to TV is higher (85%) than the mothers who are no exposure to TV (53%). Considering mothers listening radio, seven out of ten mothers (69%) who listened to Radio used ANC compared with only half (50%) who doesn't listen radio. On the contrary, percent of mothers (53%) who read newspapers used ANC is less than the mothers (57%) who did not read newspapers. *(explain why? It is explained in the Multivariate analysis part)*

The result shows that among the mass media TV and radio have association with ANC at .001 level of significance (p<.001). These mean that mothers who exposed to TV and radio were significantly more used ANC than the mothers who did not expose to TV and radio.

Table 5: Percentage distribution of pregnant mothers by ANC utilization and Programme factors/characteristics

Programmatic factors/ Characteristics (Exposure to Mass media)	ANC Utilization			Grand	χ^2
	Yes (%)	No (%)	Total (%)	Total (N)	
Watching TV					
No	53.3	46.7	100.0	4959	163.8***
Yes	84.6	15.4	100.0	450	
Listening radio					
No	50.3	49.7	100.0	3800	164.6***
Yes	69.2	30.8	100.0	1608	

Table 5: Percentage distribution of pregnant mothers by ANC utilization and Programme factors/characteristics *(Continued)*

Programmatic factors/ Characteristics (Exposure to Mass media)	ANC Utilization			Grand	χ^2
	Yes (%)	No (%)	Total (%)	Total (N)	
Reading newspaper					
No	57.1	42.9	100.0	3770	
Yes	53.3	46.7	100.0	1638	6.5**
Total	**55.9**	**44.1**	**100.0**	**5408**	

*Note: **p<.01, ***p<.001*

Multivariate Analysis (Binary Logistic Regression) and Discussion

In this study the outcome of the dependent variable is dichotomous. This is why a binary logistic regression model has been used to assess the net effect of each of the independent variables on the dependent variable. Two models have been used in this analysis. The first model contained the individual factors such as demographic characteristics, socio-economic characteristics, cultural and community factors as explanatory variables. The second model includes programmatic factors (exposure to mass media, ie. TV, radio and newspaper) to assess the net effect of mass media on antenatal care utilization while taking into account other socio-demographic and cultural/community factors as control variables.

In the first model (Table 6), all variables i.e. age, place of residence, number of children, mother's educational level, mother's occupation, husband's education, household's income status, religion, and distance to health facility (health accessibility) are statistically significant on antenatal care utilization. In case of age, mothers of middle age groups (25-34 years) are 1.3 times more likely to use antenatal care than mothers of high age groups (35-49 years). Mothers, who live in urban areas, are almost two (1.80) times more likely to use antenatal care than mothers who live in the rural areas. Mother's education and household's income have positive and statistically high impact on antenatal care utilization. High educated mothers are, 15.6 times more likely to use ANC comparing mothers with no education. Similarly, Women from richest household income group are, 3.7 times more likely to use ANC than mothers from poorest households. On the other hand, mothers who are involved in agriculture are 1.4 times more likely to use ANC than mothers who are not employed. Regarding religion, non-Muslim mothers are using 1.3 times more ANC than the Muslim mothers. In case of distance from health facilities, mothers living within 2 kilometers of the health facilities are 1.7 times more likely to use ANC than mothers who are living more than 4 kilometers far from the health facilities.

Table 6: Odds Ratio of independent variables on antenatal care (ANC) utilization by model

Independent variable	Variables and characteristics	Model I	Model II
	Age of mothers (years)		
	15-24	1.30	1.26
	25-34	1.29*	1.24*
	35-49 ®	1.00	1.00
Demographic	**Place of residence**		
Factors	Rural ®	1.00	1.00
	Urban	1.80***	1.34***
	No of living children		
	No child	1.72*	1.64
	1-2 child	1.10	1.05
	3 or more ®	1.00	1.00
	Mother's educational level		
	No education ®	1.00	1.00
	Primary	1.63***	1.56***
	Secondary	2.59***	2.28***
	Higher	15.60***	
			13.21***
	Mother's occupation		
	No occupation ®	1.00	1.00
Socio-economic	Agriculture	1.36*	1.34*
factors	Non agriculture	0.99	0.96
	Husband's education		
	No education ®	1.00	1.00
	Primary	0.92	0.90
	Secondary	1.22*	1.18
	Higher	1.40*	1.32
	Household's Income Status		
	Poorest ®	1.00	1.00
	Poorer	1.37***	1.30**
	Middle	1.93***	
			1.80***
	Richer	2.27***	
			1.98***
	Richest	3.71***	
			3.14***
	Religion/Ethnicity		
	Non Muslims	1.30**	1.29**
Cultural and	Muslims ®	1.00	1.00
Community	**Distance to health facility**		
factors	Less than 2 Kilometer	1.66**	1.70**
	2-4 Kilometer	1.53*	1.56*
	More than 4 Kilometer ®	1.00	1.00

Table 6: Odds Ratio of independent variables on antenatal care (ANC) utilization by model *(Continued)*

Independent variable	Variables and characteristics	Model I	Model II
	Watching TV		
Programme factors (Exposure to mass media)	No ®		1.00
	Yes		2.13***
	Listening to radio		
	No ®		1.00
	Yes		1.70***
	Reading newspaper		
	No ®		1.00
	Yes		1.16
	Intercept	0.13	0.13
	-2 log likelihood	6345.60	6292.56
	Cox & Snell R square	0.18	0.19

Note: *p<.05, **p<.01, ***p<.001, ® = Reference category

Model 2 shows (Table 6) the final results after adding programmatic factors (exposure to mass media, i.e. watching TV, listening radio, and reading newspapers/magazines). Value of odd ratios of all variables in the Model 2 has been reduced a little bit after adding programmatic factors. Even after this, except only two individual variables (no of children and husband's education) almost all the variables of demographic, socio-economic, and cultural/community factors of Model 2 retained statistically significant. This means that, program factors are important predictors of ANC utilisation.

Regarding age, mothers of middle age groups (25-34 years) are 1.24 times more likely to use ANC than mothers of senior age groups (35-49 years). Similar result is seen in a joint WHO-UNICEF study on receiving antenatal cares by different age groups in developing countries (WHO-UNICEF 2003). The probable cause of using more ANC by mothers of this age group might be they are more conscious and more willing to receive ANC than mothers of other age groups; especially younger mothers are less willing to receive ANC from a doctor. Considering place of residence, pregnant mothers of urban areas are 1.3 times more likely to use ANC care than mothers who are living in rural areas. The WHO-UNICEF study also reveals that in Ethiopia, Morocco, Pakistan and Yemen the urban rate for four or more visits is at least six fold the rural rate. Similar results are seen in studies on antenatal care utilization in Nigeria (Kupari, 2005) and Sudan (Ibnouf et al., 2007). This difference happens due to the distribution of hospitals and health facilities, which are more often located in urban areas. Mother's level of education has significant effect on using ANC. Mothers with higher education are 13 times more likely to use ANC care than mothers who have no education. Many studies (Abdalla 1993; Ahmed and Mosley

1997; Regmi and Manandhar 1997, and Universidad del Rosario, 2008) have also shown that utilization of maternal and child health services are strongly and positively affected by woman's education. Educated mothers are aware about their health problems, rights and very much conscious of doing right things in the right time. That is why the more the mothers are highly educated the more the ANC they use.

Regarding occupation, mothers who are involved in agriculture are 1.3 times more likely to use ANC than mothers who have no occupation. This may happen due to mothers involved in agriculture have more ability to afford health care than jobless mothers. Mothers from richest household income quintiles are, 3.1 times more likely to use ANC than mothers from poorest income quintiles. The study by WHO-UNICEF (2003) and Regmi and Manandhar (1997) reveal that mothers from high income households receive more maternal health services than poor mothers. Another study by Koeing (2007) also indicates that cost plays an important role in using maternal health and care seeking behavior in Bangladesh. As we know, purchasing of any kinds of health services depends on one's financial ability and obviously a well to do family can use expensive and quality services than poorer families. Religion also has significant impact on ANC. Mothers from non-Muslim community are using 1.3 times more ANC than the women of Muslim communities. A study conducted by Rajshahi University in rural Bangladesh reveals that from the religious point of view non-Muslims receive more antenatal care than the Muslim community (Abedin et al., 2008). In a study in Ethiopia (Mekonnen, 2003) also shows that religion as an independent variable has an influence in using maternal health cares. Though Bangladesh is a nation of Muslim majority but in the Muslim society, families and mothers are more conservative than non-Muslim families, which might be the cause to less use of ANC by the Muslim mothers. In contrast, an article on antenatal care use in Ghana (Overbosch et al., 2004) reveals that a special targeting of antenatal care according to religion seems to be unnecessary. Regarding distance from health facilities, mothers living within 2 kilometers of the health facilities are 1.7 times more likely to use ANC than mothers who are living more than 4 kilometers far from the health facilities. Studies in the previous literature review (Monika, Nyovani and Roberto, 1999, and Guo-qing et al., 2004) reveal that accessibility to health services including distance and transport costs have significant influence on antenatal care utilization. More distance relates many things to use ANC, e.g. transport cost, time, not willing to go far, etc. are the probable barriers for less using ANC by the mothers living far away from health facilities.

Regarding exposures to mass media TV and Radio have statistically significant effect on the use of ANC. Women who have exposure to TV are 2.1 times more likely to use ANC than those who do no expose to TV. Similarly, mothers who are listening to radio are 1.7 times more likely to use ANC than those who do no listen to radio. The findings from the study conducted in China revealed that the antenatal care was associated with access to mass media (Guo-qing et al., 2004). A literature review on antenatal care utilization in developing countries revealed that mass media exposure had a significant effect on antenatal care utilization (Simkhada et al., 2008). However, newspaper has no significant impact in using ANC. It is found

that around seven of ten mothers (68%) either non-educated or completed only primary education. They may seldom go through the information in newspapers. On the other hand, the newspapers may provide messages on ANC/maternal health occasionally. But TV and Radio are providing these messages almost everyday. The audio visual methods are more powerful than only reading. Probably and that is why, newspaper failed to be statistically significant.

Conclusion

Health systems of Bangladesh are well equipped with strong family planning and safe motherhood programs but maternal deaths still remain the single most important cause of death among adult females, and the estimates appear robust because several different approaches (household survey, sisterhood, and verbal autopsy) here produced consistent results (NIPORT, 2003). The maternal mortality ratio (MMR) is around 320/100,000 live births (NIPORT, 2005), one of the high ratio countries in the world and occupied the top position among the South Asian countries. Different types of complications such as hemorrhage (antepartum and postpartum), eclampsia, prolonged/obstructed labor, and puerperal sepsis etc. push the mothers to death. Pregnant mothers may get rid of these types of complications having proper maternal services. Antenatal care (ANC) has a vital role to identify and reduce these complications of pregnant mothers which in turn will reduce the maternal deaths.

A total of 5,408 mothers aged 15-49 years from the DHS survey, who gave birth within last five years of the study have been used as unit of analysis for this study. Univariate and bivariate analyses are used for describing of background characteristics of the sample and association between dependent and independent variables. To find out the expected outcomes, multivariate (binary logistic regression) analysis is performed in this study.

The study has found that only 56 percent mothers receive any ANC from qualified or non-qualified service providers. Other 44 percent mothers do not receive any ANC, which is a big concern for pregnancy related complications. There are many factors related to socio-demographic and other reasons, why a number of pregnant mothers are not seeking any ANC. These include, not needed/not beneficial, expensive, not aware to receive service, not permitted to go outside the house, religious reasons, quality of service, too far, etc. Bivariate analysis shows that age of mothers, place of residence, number of children, education, household's income level, religion, distance to health facilities, mass media have association to receiving ANC. Logistic regression analysis has shown the program factors, particularly exposure to mass media (TV and Radio) had significantly impact on ANC use while controlling all other variables. This means mothers who had exposure to TV and Radio were more likely to use ANC compared to those who were not exposed to mass media. On the other hand, among the mass media, newspaper did not show any significant effect in using ANC. A major cause of this might be that about seven of ten mothers (67%) either non-educated or completed only primary education. And this is why printed

media can not influence them. Rather they are more influenced by the audio-visual media (TV and radio). Considering all these, it can be concluded that number of factors are responsible to influence the utilization of ANC. Among these, mass media is an important predictor which has significant effect on receiving ANC all over the country.

Recommendations

Based on the findings of the present study, some policy recommendations have been proposed which could be useful for policy makers and planners in formulating plans and programs to improve the maternal health of women of reproductive ages:

- To increase the coverage of ANC, mass media, particularly TV and radio should engage nationally and internationally reputed celebrity as they have well acceptance in the society and they have a big influence to convince and change behavior of respondents.
- TV and Radio broadcasting should consider mother's age, place of residence, culture/religion, level of education, and languages and local dialects during designing the program.
- Due to less accessibility and availability to health services, i.e. distance, times to health facilities, transportation costs, lacks of number of facilities, many of the mothers and families are not willing to receive ANC. So, functioning and effective ANC services need to be readily accessible and, government should strengthen lower-level facilities.

Suggestions for further research

A further research can be done on how much times the mothers are spending in exposing the health issues for each mass media. The effectiveness of programs /messages broadcast by mass media needs to be analyzed by further research whether those programs needs any revision, addition or change to convince the respondents.

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The Factors Affecting Knowledge of Source for Condom in Vietnam 2005

Dinh Thi Thanh Hoa

Abstract

In Vietnam in recent years, condoms have been used for the following purposes: family planning and reproductive health care, and HIV/STI prevention. Therefore, knowledge of sources where condoms can be obtained is one of the major indicators to measure the success of HIV/AIDS prevention programs. But the source for condoms can only be known if condoms and the information about the condom sources is obtained by users/consumers. This research examines the factors affecting knowledge of condom sources using secondary data from the VPAIS conducted in 2005. The factors examined include individual background characteristics, HIV/AIDS knowledge on condom use, and exposure to mass media such as reading newspapers, listening to the radio, and watching television. The relationship between these factors and the knowledge of condom sources is examined using bivariate and multivariate analyses.

The analysis unit for this research is the individual aged 15-49. A total of 13,996 people were interviewed, including of 7,289 women and 6,707 men. The analysis results show that individual characteristics such as age, educational level, marital status, wealth, and type of place of residence are significantly related to the knowledge of condom sources. Similarly, HIV/AIDS comprehensive knowledge and frequency of exposure to mass media are significant factors. Therefore this study presents practical information in support of developing strategies, planning, and managing condom availability in Vietnam.

Keywords: Knowledge of source for condoms/affected factors

Introduction

In 2005, Vietnam has a total population of more than 84 million and the population growth is 1.4 percent per year (WHO, 2005). The sex ratio is 98. In demographic context, Vietnam is a populous country and is young population with 51.3 percent of population that is under the age of 25. The young group (ages 15-24) accounts about 16 million and occupies 21 percent of total population in Vietnam. After economic reform in 1990, Vietnam economic is rapidly developing in market orientation. The achievement of economical reform and society development is reflected by increasing double of income per capital from 200 USD to nearly 400 USD per year. The social development is remarked by improving social and health care services in both quantity and quality. Despise all remarked efforts, Vietnam is still a poor country and reducing population grow rate is one of objectives in development strategy. Otherwise Vietnam can not be able to stabilizing population size and to improving quality of life.

In order to achieving lower fertility and stabilize population, the *Strategy in Population and Family Planning to the year 2000*, the *Strategy in Population for period 2001-2010*, the *Strategy in Reproductive health for period 2001-2010* and the *State Law of Population* were launched by the National Assembly's Standing Committee. Vietnam is one of the first developing countries to adopt a policy that promote to "a family norm of one or two children". Over last two decades, the IUD has been the most popular method of contraceptive in Vietnam (38.7% in 1997) (UNFPA 1995). Other modern methods are used such as female sterilization (6.3 percent) and oral contraceptives (5.7 percent). About 8 percent of the population of age range 15-49 years use condom as a contraceptive method (UNFPA 2000). Surveys indicate that rate of IUD user has decreasing and the use of other modern methods as condom is increasing rapidly.

Since the first case of HIV was reported in Vietnam in December 1990, condom use in safer sex practice has been recognized. However, the number of reported HIV cases has been increasing quickly in the country. There have been alarming signs show that an increasing trend of new HIV infected cases through sexual contacts. It is leading to HIV transmission from high-risk behavior groups (e.g. injecting drug users and female sex workers) to general population. In 2005, the reported number of HIV infection is more than 100,000 cases, 7,124 reported cases are AIDS patients and about 10,000 died by AIDS (MOH 2006). The estimated adults HIV prevalence is 0.5 percent in 2007 (EFS 2008). The projected number of HIV infection is higher than reported ones. Therefore, the HIV/AIDS epidemic seriously threat to the population health. Similarly responding to family planning, Vietnamese government is among leading countries in the world in the fight against HIV (UNAIDS 2001). Accompanying with improving HIV knowledge, other intervention activities are also conducted such as condom supply that is also supported by some regulation. However it is more favored from 2007 when the *Law on HIV/AIDS*

Prevention and Control and the *Government Decree No.108/2007/ND-CP of June 26, 2007, detailing the implementation of a number of articles of the Law on HIV/AIDS Prevention and Control* were improved and has been coming into existence. It helps to create a better legally supportive environment for condom distribution and condom social marketing activities, making condom become more accessible and available at not only traditional outlets as drug stores but also in entertainment-based service centers (e.g. hotels, guest houses, karaoke bar and restaurants).

In practice, condom for both family planning and reproductive health care as well as HIV/AIDS/STI prevention is partly distributed by a network of government family planning community workers. Other condom distribution channel is conducted by social marketing program. So currently existed condom distribution channels in Vietnam are: (1). *Condom sold commercially in the open market* (legally or illegally imported condom): wide ranges of types of condoms, varying from different prices (from cheap to expensive one) and manufacturers from China, Hong Kong, or Japan; (2). *Free distribution channels through family planning system and health facilities* (this used to be only for family planning and mainly used condom that is produced in Vietnam) and *through international organization projects* (using to target group, direct beneficiaries of the project for family planning or HIV/STI prevention purpose);(3*). Subsidized condom through social marketing program* is ongoing. Condom social marketing program is conducted under the support of the government and international non-government organizations. It consists of two channels: traditional channel and non-traditional channel. Although more increasing HIV/STI prevention knowledge the prevalence of condom use is still low in Vietnam (UNAIDS 2005). Among Vietnamese young people, the low condom use rate is not only presented by figure but also by indirect indicates such as increased unwanted pregnancy, induced abortion and STI/HIV infection over time (Gammeltoft, T. 2002).

There are various reasons for unexpectedly low condom use rate. They may include issues related to condom availability, accessibility, acceptability. For example, lack of information about condom distribution source, low condom quality, beliefs on reducing sexual pleasure by using condom, etc. Usually, if you want to use the condom, you should know the place where condom can be obtained. Availability of condom should be accompanied with the information about where to get condom. According to the VPAIS 2005, nearly a half of youth (44.4 percent in young women and 42.6 percent in young men) do not know source for condom. In 2002, 17.5 percent of married women those did not know the sources for condoms (DHS 2002). The low percentage of young people who know about condom sources raises questions about the factors leading to this knowledge. The factors may be that condom sources did not exist, information about condom sources was not disseminated to the people, or other factors depending on the person. In order to classify these factors, they are divided into two groups. The first group consists of program factors such as condom distribution and dissemination of condom source information. The individual factors were in the second group. Because of the

limitation of secondary data analysis, only individual characteristics will be examined concerning how they affect the knowledge of condom source.[12] However, the findings on how individual factors are related to knowledge of condom sources are discussed in light of recent changes in condom programming in Vietnam.

Data and Methodology

Vietnam Population and AIDS Indicators Survey 2005 (VPAIS 2005) was used in secondary data analysis. The national data set of VPAIS 2005 was designed to obtaining national and sub-national information about program indicators of knowledge, attitudes and sexual behavior related to HIV/AIDS. Total of interviewed individuals is 13,996 in which number of women is 7,289 and number of men is 6,707.The unit of analysis is individual. All men and women aged 15-49 who were either permanent residents of sampled households or visitors present in the household during the night before the survey were eligible to be interviewed in the survey. The Statistical Packages for Social Sciences (SPSS) was used for data analysis. The logistic regression model was used to examine the relationship between background characteristics, HIV/AIDS prevention knowledge, frequency of accessing to mass media and knowledge of source for condom. In the model, the dependent variable is knowledge of source for condom. The independent variables are background characteristics (group age, sex, highest education level, wealth index, marital status, type of place of resident), HIV/STI knowledge (knowing reduce the chance of getting AIDS by always using condom during sex and knowing the way to avoid AIDS by using condom) and frequency of access to mass media (at least one time per week watching television, listening to the radio or reading a newspaper).

Data analysis process was divided two parts. In the first part, the frequencies and cross tabulation was applied to present the distribution of samples by background characteristics, HIV/AIDS knowledge and frequency to assess to the mass media. Prevalence and pattern of knowledge of condom source were showed by result from binary analysis. In the second part, logistic regression analysis of knowledge of condom source had done by three model of regression. In the first model, the variables are related to the individual characteristics such as age, sex, education, income, married status and place of residence. The second model, added variables reflect the HIV knowledge of respondents such as knowledge of condom use to avoid HIV and knowing condom use as one of the ways to reduce the chance to getting HIV virus. The added variables those are regarding frequency of accessing to mass media are entered in the third model. The main mass media consists of newspaper, radio and television. The multicollinearity between independent variables in the model of knowing a condom source was examined. The result showed that there is not any correlation that is higher than 0.65. It means that there is not multicollinearity between independent variables in these models.

[12] In this study condom means male condom and does not include a discussion of female condoms.

Results

Descriptive analysis

The result of descriptive analysis is showed in Table 1, Table 2 and Table 3. From the result, we can know the distribution of samples by individual characteristics. In total of 13,996 respondent aged 15-49, the number of married and unmarried women is 7,289 and number of those men is 6,707. Background characteristics are presented in Table 2 and include age groups, highest education level, wealth index and type of place of residence. Percentage distribution is showed in each unmarried and married women as well as those men. In unmarried group age 15-49, more than a haft (56.2 percent and 53 percent) of women and men are 15-19 years olds. There are a few married youths in this age group. In both women and men groups, married respondents occupied about one of the third in group aged 25-39 and about more than a haft of group aged 40-49 (54.6 percent and 61 percent). Two the third of respondents have highest education level that is secondary school and about 10 percent to 17 percent in each group have higher secondary education. In married and unmarried groups, nearly or more than a haft of women and men are rich in wealth index. The number of respondents those live in urban place is less than once those live in rural once.

Table 1: Distribution of samples by background characteristics

Background characteristics	Women age 15-49			Men age 15-49		
	Never-married (%)	Ever-Married (%)	Total (number)	Never-married (%)	Ever-Married (%)	Total (number)
Age						
15-19	56.2	1.7	1,346	53.0	0.6	1,400
20-24	27.0	10.5	1,132	28.8	5.5	974
25-39	11.4	33.2	1,932	15.7	32.9	1,759
40-49	5.4	54.6	2,879	2.5	61.0	2,574
Highest education level						
Never attended school	2.3	7.3	422	1.6	4.5	228
Primary	12.2	22.0	1,383	10.7	19.4	1,076
Secondary	68.8	60.0	4,567	72.4	65.0	4,554
Higher secondary	16.8	10.7	917	15.3	11.0	849
Wealth index						
Poor	26.4	35.0	2,358	30.5	35.3	2,242
Middle	18.2	16.8	1,259	18.7	17.3	1,196
Rich	55.3	48.2	3,672	50.8	47.4	3,269

Table 1: Distribution of samples by background characteristics *(Continued)*

Background characteristics	Women age 15-49			Men age 15-49		
	Never-married (%)	Ever-Married (%)	Total (number)	Never-married (%)	Ever-Married (%)	Total (number)
Type of place of residence						
Urban	41.0	31.7	2,517	35.0	30.9	2,180
Rural	59.0	68.3	4,772	65.0	69.1	4,527
Total	100.0	100.0	7,289	100.0	100.0	6,707

Table 2 is showed the respondents' HIV/AIDS prevention knowledge related to condom use. Although 86.4 percent of unmarried women group agreed that it may reduce the chance of getting AIDS by always using condom during sexual intercourse, there are still 41.5 percent of them do not know one of the ways to avoid AIDS by using condom. It is similar in married women group (92 percent vs. 32.5 percent) as well as unmarried men group (92.7 percent vs. 32.3 percent) and married men groups (96 percent vs. 28 percent). The percentage of respondents those are do not know reducing the chance of getting AIDS by always using condom during sex and one of the ways to avoid AIDS by using condom in sexual intercourse is not significant but it is made attention, especially in unmarried women (14 percent and 9 percent).

Table 2: Distribution of samples by HIV/AIDS knowledge

HIV/AIDS knowledge	Women age 15-49			Men age 15-49		
	Never-married (%)	Ever-Married (%)	Total (number)	Never-married (%)	Ever-Married (%)	Total (number)
Reduce the chance of getting AIDS by always using condom during sex						
Agree	84.6	92.0	6,035	92.7	96.0	6,009
Do not agree	1.4	2.2	133	0.8	1.4	74
Do not know	14.1	5.7	559	6.5	2.7	263
	100.0	100.0	6,727	100.0	100.0	6,346
Know the way to avoid AIDS by using condom						
Yes	49.2	60.6	4,164	61.0	67.4	1,990
No	41.8	32.5	2,579	32.3	28.0	4,356
Do not know	9.0	6.8	546	6.7	4.5	361
	100.0	100.0	7,289	100.0	100.0	6,707

The frequency of assessing to the mass media such as reading newspaper or magazines and listening to the radio is quite different in each group except watching

the television (Table 3). Around 20 percent in each group of unmarried/married both women and men read newspaper of magazines or listen to the radio every day or at least one a week or less than one a week. In those groups, there is the higher percentage of not at all to reading the newspaper or listening to the radio. Watching the television is most popular in all groups with 85 percent of watching every day except 79 percent in married women group.

Table 3: Distribution of samples by frequency of access to mass media

Background characteristics	Women age 15-49			Men age 15-49		
	Never-married (%)	Ever-married (%)	Total (number)	Never-married (%)	Ever-married (%)	Total (number)
Frequency of reading newspaper or magazines						
Not at all	29.5	53.4	3,357	30.7	40.8	2,475
Less than one a week	21.5	19.4	1,462	21.2	19.1	1,334
At least one a week	26.2	13.4	1,262	28.4	18.5	1,497
Almost every day	22.9	13.8	1,208	19.6	21.6	1,398
	100.0	100.0	7,289	100.0	100.0	6,704
Frequency of listening to the Radio						
Not at all	40.7	48.7	3,372	34.2	34.7	2,312
Less than one a week	19.4	18.1	1,350	18.5	15.8	1,128
At least one a week	19.4	14.9	1,188	25.1	21.1	1,520
Almost every day	20.4	18.3	1,379	22.2	28.4	1,744
	100.0	100.0	7,289	100.0	100.0	6,704
Frequency of watching Television						
Not at all	2.5	5.5	334	1.3	3.3	170
Less than one a week	3.1	4.2	281	2.4	3.2	193
At least one a week	9.2	11.4	780	9.6	8.6	602
Almost every day	85.3	78.9	5,892	86.7	84.9	5,737
	100.0	100.0	7,287	100.0	100.0	6,702

Prevalence and pattern of knowledge of condom source

Among respondents, there is one of the third (33% vs.66%) those do not know condom sources or by other words, only two and the third of respondents know the source where they can take the condom. Its distribution is presented in graph 3. While 75 percent and 73 percent of respondents in married women and married men groups know, the lower percentages are in unmarried both women and men groups (51 percent and 41 percent).

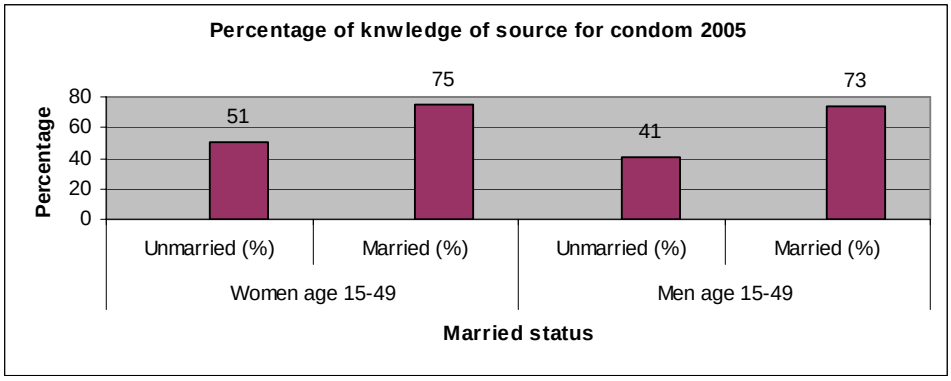

Figure 1: Distribution of knowledge of condom sources by groups

Source: VPAIS 2005

Table 4 showed the distribution of knowing the condom source by background characteristics. By look at chi square statistic, analysis results also showed that there are significant relationship between knowledge of source for condom and all background characteristics. By age group and in never/never married both women and men, highest percentage (from 63% to 81%) of knowing condom source belong to the respondents in group aged 25-39 in comparing with knowledge of other age groups. The lowest percentage (from 41% to 60%) of knowing condom source is in the youngest age group (15-19 years old). In distribution of knowing condom source by highest education level, the respondents those have higher secondary school have highest percentage of knowledge than those have lower education level. Especially, the respondents those were not attended to school have lowest percentage of knowing comparing with others have ever attended to school. It is similar to comparing of knowing condom source by wealth index. The respondents those have higher wealth index also have better knowing. Type of place of residence is one factor that reflect the deference of knowledge of source for condom between never/ever married both women and men groups. In all these groups, the respondents those live in urban areas have better knowing than those live in rural areas.

Table 4: Prevalence distribution of knowledge of condom source by background characteristics

Background characteristics	Knowing condom source among women age 15-49				Knowing condom source among men age 15-49			
	Never-married		Ever-married		Never-married		Ever-married	
	%	N	%	N	%	N	%	N
Age								
15-19	41.4	1,258	60.2	88	45.0	1,375	60	25
20-24	64.9	604	71.6	528	71.2	747	64.8	227
25-39	63.1	255	79.7	1,677	81.1	408	75.6	1,351
40-49	48.3	120	73.4	2,759	67.7	65	73.0	2,509

Table 4: Prevalence distribution of knowledge of condom source by background characteristics *(Continued)*

Background characteristics	Knowing condom source among women age 15-49				Knowing condom source among men age 15-49			
	Never-married		Ever-married		Never-married		Ever-married	
	%	N	%	N	%	N	%	N
Highest education level								
Never attended school	5.8	52	27.8	370	21.4	42	35.5	186
Primary	27.9	272	63.6	1,111	40.8	277	61.2	799
Secondary	47.8	1,538	81.3	3,029	56.4	1,880	76.0	2,674
Higher secondary	84.8	375	95.8	542	86.6	396	94.7	453
Wealth index								
Poor	33.5	591	60.2	1,767	44.4	791	56.6	1,451
Middle	45.1	408	76.5	851	52.3	486	74.8	710
Rich	60.6	1,238	85.3	2,434	69.9	1,318	85.2	1,951
Type of place of residence								
Urban	62.1	917	84.8	1,600	71.4	909	88.9	1,271
Rural	42.7	1,320	70.5	3,452	52.0	1,686	66.3	2,841
Total	50.6	2,237	75.1	5,052	58.8	2,595	73.3	4,112

Table 5 showed the distribution of knowledge of source for condom by HIV knowledge of respondents and the analysis results also showed that there are significant relationships between knowing condom source and HIV knowledge of respondents. Two HIV knowledge variables related to condom were used and presented in each never/ever married women and men. It is clearly that the respondents those had HIV knowledge have better knowing condom sources. The difference was too large. For example, it is 59.9% vs.24% in never-married women group that have HIV knowledge that can be reduced the chance of AIDS by always using condom during sex. Even having HIV knowledge, the percentage of knowing condom source of men is higher than once of women in never-married group. However, it is opposite in ever-married women and men. There are small percentages in each categorical group that do not sure about their own HIV knowledge but some of them knowing condom source.

Table 5: Prevalence distribution of knowledge of condom source by HIV/AIDS Knowledge

Background characteristics	Knowing condom source among women age 15-49				Knowing condom source among men age 15-49			
	Never-married		Ever-married		Never-married		Ever-married	
	%	N	%	N	%	N	%	N
Reduce the chance of AIDS by always using condom during sex								
Agree	59.9	1,763	83.0	4,272	65.7	2,280	78.5	3,729
Do not agree	24.1	29	47.1	104	50.0	20	50.0	54
Do not know	21.8	293	47.0	4,272	8.1	160	31.1	103
Know the way to avoid AIDS by using condom								
Yes	68.0	1,101	87.2	3,063	72.5	1,583	83.1	2,773
No	37.0	935	57.1	1,644	40.8	838	54.5	1,152
Do not Know	18.4	201	53.3	345	20.7	174	44.4	187

Table 6 showed the prevalence distribution of knowledge of source for condom by frequency to assess to mass media. The analysis result was also presented the significant relationship between knowledge of source for condom and respondent's frequency to assess to mass media. In each categorical of each mass media, there are too difference in percentage of knowing condom source. However, general finding is that higher frequency to assess to any mass media, higher knowing condom source. Related to frequency of reading newspaper/magazines, there is remarkable difference between group assessing and not. It is almost similar in watching television. The difference is not so much between group assessing less than one time per week and group assessing more than one time per week of listening the radio.

Table 6: Prevalence distribution of knowledge of condom source by frequency of access to mass media

Background characteristics	Knowing condom source among women age 15-49				Knowing condom source among men age 15-49			
	Never-married		Ever-married		Never-married		Ever-married	
	%	N	%	N	%	N	%	N
Frequency of reading newspaper or magazines								
Not at all	27.8	659	63.8	2,698	39.6	797	57.4	1,678
Less than one a week	51.0	480	84.0	982	55.0	551	76.0	783
At least one a week	60.7	585	89.2	677	67.2	737	84.1	760
Almost every day	68.0	513	92.4	695	80.7	509	91.8	889
Frequency of listening to the Radio								
Not at all	45.3	911	69.1	2,461	50.1	887	64.7	1,425
Less than one a week	49.9	435	75.7	915	58.8	480	73.8	648
At least one a week	51.8	434	81.0	754	62.7	651	77.6	869
Almost every day	60.6	457	85.5	922	67.9	576	80.5	1,168
Frequency of watching Television								
Not at all	18.2	55	32.3	279	14.7	34	39.0	136
Less than one a week	24.6	69	48.6	212	49.2	63	41.5	130
At least one a week	41.5	205	67.7	575	45.6	248	61.3	354
Almost every day	53.5	1,908	80.5	3,984	61.2	2,248	77.1	3,489

Logistic regression analysis of knowledge of condom source

Result of logistic regression analysis of knowledge of condom source in relation to the independent variables is presented in the Table 7. In the first model, all factors of individual characteristics such as age, education level, wealth index, married status and type of place had positive and statistically significant impact on knowing condom source except sex of respondents. Regarding age group, young respondents in group age 20-24 have nearly 2 times more chance to know than youths in group aged 15-19. Respondents those are 25-39 or 40-49 years old had 2.6 or 1.8 times more chance to know than those are 15-19 years old. Concerning to the education level, the respondents those had secondary education had 6.1 times more chance to knowing condom source than others those had no education. Especially, the respondents those had higher secondary school had 20.6 times more chance to knowing condom source than those never attended school. When looked at wealth index, the rich group also had 1.8 times more chance to know than the poor group. The result is also showed that ever-married respondents have 2.2 times more increasing of knowing than never-married once. In addition, the respondents those live in urban area had nearly 1.4 times more chance to know than those live in rural

area. Therefore, when considering only on individual characteristics, it can be said that respondents those were older age and ever-married, had higher education level and higher wealth index and lived in urban area were more likely to knowing condom source than their counterpart in this study.

Table 7: Logistic regression model for knowledge of condom source

	Model 1		Model 2		Model 3	
Characteristics	**B**	**Exp(B)**	**B**	**Exp(B)**	**B**	**Exp(B)**
Age						
15-19 @						
20-24	0.73	2.08***	0.67	1.95***	0.68	1.97***
25-39	0.95	2.59***	0.83	2.29***	0.85	2.33***
40-49	0.56	1.75***	0.44	1.55***	0.45	1.57***
Sex						
Female @						
Male	0.04	1.04	-0.13	0.88**	-0.18	0.84***
Highest education level						
Never attended school @						
Primary	1.19	3.28***	0.49	1.63***	0.39	1.48**
Secondary	1.81	6.13***	0.77	2.16***	0.56	1.75***
Higher secondary school	3.03	20.61***	1.82	6.15***	1.44	4.24***
Wealth Index						
Poor @						
Middle	0.32	1.38***	0.21	1.23**	0.15	1.16*
Rich	0.60	1.83***	0.46	1.58***	0.33	1.39***
Married Status						
Never-married @						
Ever-married	0.81	2.24***	0.76	2.13***	0.81	2.25***
Type of place of residence						
Rural @						
Urban	0.30	1.35***	0.33	1.39***	0.25	1.28***
Reduce the chance of AIDS by always using condom during sex						
Do not agree @						
Agree			1.41	4.08***	1.34	3.83***

Table 7: Logistic regression model for knowledge of condom source *(Continued)*

Characteristics	Model 1		Model 2		Model 3	
	B	Exp(B)	B	Exp(B)	B	Exp(B)
Know the way to avoid AIDS by using condom						
Do not know @						
Know			0.94	2.57***	0.93	2.53***
Frequency of reading newspapers						
Less than one a week @						
At least one a week					0.46	1.58***
Frequency of listening to the radio						
Less than one a week @						
At least one a week					0.14	1.15**
Frequency of watching television						
Less than one a week @						
At least one a week					0.36	1.43***
Model Chi Square	2,537.424		3,937.107		4,030.805	
Df	11		13		16	
Cox and Snell "R" value	0.17		0.24		0.25	

*P<0.05 **p<0.01 ***p<0.001 @ reference group

In second model, the variables of knowledge of condom use to avoid HIV and knowing used condom as one of the ways to reduce the chance to getting HIV are added and found that the result was changed. All the individual independent factors retained their significance related to knowing a condom source. It showed that respondents those have knowledge of condom use to avoid HIV have 2.6 more times increased to knowing condom source than those had not this knowledge. Similarly, the respondents those know used condom as one of the ways to reduce the chance to getting HIV has 4.1 more times increased to know of condom source than those did not know. The result is also found that. Model chi square value increased remarkably from 2,537.424 in model 1 to 3,937.107 in model 2 while Cox and Snell "R" value was increased from 0.17 to 0.24. According to the Cox and Snell "R" value, 17% of variance in dependent variable of knowing condom source is explained by individual factors in model 1 and 24% of variance in knowing condom source is explained by individual factors and their HIV knowledge in model 2. Therefore, depend on the chi square value, it can be said that the relationships of independent and dependent variables were stronger in model 2 than ones in model 1.

In the third model, the frequency of access to mass media such as reading newspaper/magazines, listening to the radio and watching a television was entered. The result showed that all personal factors, their HIV knowledge and their frequency of access to mass media were significantly related to knowing condom source. It also found out that the respondents those have at least one time per week to reading newspaper/magazines had 1.6 more time increased to knowing condom source than those have less than one per week. Similarly, the respondent those have at least one time per week to listening to the radio had 1.2 times more chance to knowing condom source than those have less than one per week. The respondents those have at least one time per week to watching the television have 1.4 more time increased to knowing condom source than those have less than one per week. In the third model, the odds ratio slightly changed and model chi square value increased from 3,937.107 to 4,030.805 while Cox and Snell R square was changed not too much from 0.24 and 0.25 respectively. It means that 25% of variance in knowing condom source is explained by personal factors, their HIV knowledge and their frequency of access to mass media.

Discussion on result of data analysis

The overall objective of the study is to examine the individual characteristic factors that are affecting the knowledge of condom sources in Vietnam in 2005. In order to get this objective, the prevalence of knowledge of condom source and the relationship between individual characteristic factors and knowledge of condom source were presented in the results of the data analysis.

Regarding to "*The knowledge of source for condoms is significantly affected by individual characteristics in Vietnam 2005",* the logistic regression analysis showed that all individual characteristic factors are significant to knowing the sources for condoms except the gender of the respondents (Table 7). It is almost suitable with the prevalence distribution of knowledge of condom sources by background characteristics shown in Table 4. In this table, the prevalence of knowing a condom source is not so different between never-married and ever-married women and men.

Regarding to " *Respondents who have HIV/AIDS prevention knowledge are more likely to know sources for condoms than those who do not know".* It was examined by a model of knowledge of sources for condoms and the data analysis was presented in Table 7. The results found that the respondent who know that they can reduce the chance of AIDS by always using condom during sex had 4 times more chances to know the condom sources than others who did not know. Besides that, the respondents who know one of the ways to avoid AIDS by using condom had 2.6 times more chance to know than those who did not know. In addition, added variables of HIV/AIDS prevention knowledge made the prediction of the variance of knowledge of condom sources increase from 17 percent to 24 percent in term of the Cox and Snell "R" value. The relationships between independent and dependent variables were stronger than before adding these and were found by Model chi square value to increase remarkably from 2,537.424 to 3,937.107. Obviously, respondents who know

the HIV/AIDS prevention knowledge related to condom use had more chance to know sources for condoms than those who did not know.

Considered on the frequency of access to mass media by respondents, "*Respondents who more than once per week accessed mass media are more likely to know sources for condoms than those who did so less than once per week"* was examined by model of knowledge of source for condoms and the results were presented in Table 7. From Table 7, the respondents who at least one time per week read newspaper/magazines had 1.6 more chance to know condom sources than those who did so less than one time per week. Similarly, the respondent that at least one time per week listened to the radio had 1.2 times more chance to know condom sources than those who did so less than one time per week. The respondents that at least one time per week watched the television had 1.4 more chance to know condom sources than those who did so less than one time per week. So the frequency of access mass media was significantly related to knowing condom sources. Twenty-five percent of variance in knowing condom sources is predicted by personal factors, HIV knowledge and the frequency of access mass media. In addition, like most condom social market (CSM) programs, the DKT Vietnam program relies heavily on product advertising and promotion such as monthly advertisements on television or 12 newspapers and magazines such as "Youths Newspaper", "Women newspapers" etc. (Gali et al). The advertising of condoms through radio was only in Ho Chi Minh City (DKT 2000), so at the national level, listening to the radio was not significant to the knowledge of pharmacies as condom sources. Frequency of reading newspaper was not significant to the knowledge of government health centers as condom sources (Table 12) because all condom advertisement in newspapers/ magazines was conducted by condom social marketing programs. They advertised new kinds of condoms and list of pharmacies where condoms could be obtained (DKT 2000).

Summary

The overall objective of the study is to identify the knowledge of condom source and to examine the individual characteristics factors those are affecting to the knowledge of condom source in Vietnam 2005. The data analysis is used from Vietnam Population and AIDS Indicators Survey 2005 (VPAIS 2005). The VPAIS 2005 was designed to obtaining national and sub-national information about program indicators of knowledge, attitudes and sexual behavior related to HIV/AIDS. The total of interviewed individuals is 13,996 aged 15-49 in which number of women is 7,289 and number of men is 6,707. Both bivariate and multivariate analysis had been used to examine the relationship between individual characteristics, HIV/AIDS prevention knowledge, frequency of access to mass media and knowledge of condom source. There are some findings from this study.

In general: (1). There is one of the third of respondents those do not know where they can obtain condom; (2). Three sources those are best known are pharmacy

(51%), government health center (26%) and public health worker (16%); (3).The background characteristics, HIV/AIDS prevention knowledge, frequency of access to mass media had significantly relationship with knowing of source for condom except sex of respondents;

By background characteristics: (1). There are only 51% of never-married women and 59% of never-married men those know source for condom; (2). There is higher education or higher wealth index, then higher knowledge of source for condom; (3). Education is a factor that is most strong effecting to the knowing condom source; (4). There is the difference of knowing knowledge of condom source between age groups as well as urban residence and rural ones.

By HIV/AIDS knowledge: (1). Almost respondents know that can reduce the chance of getting AIDS by always using condom during sex (from 86% to 96% in ever-married/never-married women and men groups) while only 66% to 75% know one of the ways to avoid AIDS by using condom during sex; (2). HIV/AIDS knowledge was significantly impact on the knowledge of source for condom. In fact, it was significantly impact on the knowledge of source for condom as government health center or pharmacy.

By frequency to assess to mass media: (1). Nearly 90% of respondents watching television every day; (2). Frequency of reading newspaper/magazines or listening to the radio is quite difference in unmarried/married both women and men; (3). Frequency to assess to three mass media is significantly impact on the knowing condom source.

The relationship between individual characteristics and knowing source for condom: (1). All background characteristics are significantly to knowing condom source except gender of respondents; (2). HIV/AIDS prevention knowledge is strongly effecting to the knowing condom source; (3). Assessing to three mass media at least one time per week had more chance to knowing condom source than those assessed less than one time per week;

Recommendations

(1). Condom social market program design should depend on the individuals characteristics those include background characteristics, their HIV/AIDS prevention knowledge and their frequency to assess to mass media; (2). In order to increasing of knowing condom source, HIV/AIDS prevention knowledge should be also improved; (3). Condom communication campaigns should conduct separately for groups with specific background characteristics and should be focused on the groups of never attending to school or poor.

Impact of Life Changes on Consistent Condom Use Among Thai Male Youth: A Study in Kanchanburi DSS, Thailand

Dongling Wang, Aphichat Chamratrithirong

Abstract

It is a tentative study of examining the impact of life changes on consistent condom use among Thai male youth by using longitudinal study. Panel data were drawn from the first (2000) and fifth (2004) round of census in Kanchanaburi DSS, Thailand.

Among total 180 Thai male youth respondents who ever used condoms only 18 per cent persist to use condoms consistently in last twelve months. Logistic regression analysis displays that increased education has significantly positive effect on consistent condom use while broken marriage and quitting school are negative factors. Occupation change and residence change have no statistically significant association with consistent condom use. Moreover, male youth who are single, live in urban areas, have higher risk perception of STI/HIV, and use mobile phones are significantly prone to use condoms consistently compared with their counterparts. Therefore, the further programs could pay more attention to married and rural male youth, as well as using mobile phone-based intervention.

Keywords: Life Changes/ Kanchanaburi DSS/ Male Youth/ Consistent Condom Use/ Mobile Phone

Introduction

Since 1984 the first case of AIDS in Thailand was reported, Thai government made HIV/AIDS prevention and control as a national priority. From 1992 to 1996, the National AIDS program received dramatic increase of funding. However, in the late 1990s, the Asian Financial Crisis resulted in a significant reduction in the budget for HIV/AIDS prevention and control in Thailand. The reduction of budget also affected HIV and sex education for young people (Prohmmo, 2004).

Youth aged 15-24 is the crucial period between childhood and adulthood with rapid change of physical and psychological development. They may face a series of life change events as their parents ever experienced, such as finishing school study, starting to work, getting married. However, along with the change of socioeconomics and culture, the attitude and behavior of youth in “new society” is remarkably different from the old generations. In the realm of sexual and reproductive health, premarital sex is no longer uncommon among Thai youth. The National Sexual Behavior Survey of Thailand in 2006 indicates that among Thai youth aged 18-24

years 80 percent of male and 63 percent of female had ever had sex. Of those Thai youth having sexual experience, 98% of male youth and 70% of female youth ever had premarital sex (Podhisita and Xenos, 2009). However, compared with the increasing early onset of sexual activity, the usage of condom among youth is stagnant. UNAIDS's report (2006) shows that only 20-30% of sexually active youth use condoms consistently. In addition, without new HIV prevention campaign most youth probably will be unaware of the risk of unsafe sexual behavior although AIDS remains a leading cause of death among Thai youth (UNESCAP, 2006). Compared with female youth, male youth are facing more risk of HIV/AIDS because male youth are more sexually active than female youth, such as earlier initiate of sex intercourse, having multiple sexual partners, as well as visiting commercial sex workers (Sabaiying, 2009). UNAIDS (2008) also reported that HIV affects more Thai males than females.

Hence, studying the underlying cause of condom use and promoting consistent condom use among male youth are crucial to prevent youth from the risk of HIV/AIDS. However, in Thailand many researches use cross-sectional data to study condom use among youth. Very few research use longitudinal data to study condom use among Thai male youth. On the other hand, there is no literature or previous studies are found that combine life change events with condom use to predict the impact of life changes on consistent condom use.

Objective

The objective of this present study is to estimate the impact of selected life change events on consistent condom use among Thai male youth in Kanchanaburi Demographic Surveillance System (KDSS).

Data Source and Methodology

This study will use the secondary data collected in the first (2000) and fifth (2004) round of census in Kanchanaburi DSS. Kanchanaburi is a large province located in the western part of Thailand. The Kanchanaburi Project, supported by The Wellcome Trust of the United Kingdom and conducted by the Institute for Population and Social Research (IPSR), Mahidol University, establishes a longitudinal database including 5 rounds of censuses from 2000 to 2004. In each round the project comprises a study area of 100 villages/census blocks **selected by a stratified systematic sampling design** from five strata: urban/semi-urban, rice, plantation, uplands, and mixed economy. There are 20 villages/census blocks in each stratum. Data were collected by primary structural questionnaires through face-to-face interviews. The first round census was conducted between 1st July and 15th August 2000. The fifth round census was conducted from 1st July to 28th August 2004.

In each dataset, there is one variable named "**DBID**" as the *unique identification number* of each respondent. Hence, it is possible to find out the same

respondents who were interviewed in both of the surveys based on the value of "DBID". In order to predict the relationship between life changes and consistent condom use, from panel dataset **180** male youth respondents aged 19-24 in the year of 2004 who ever used condoms are recruited in this study. Regarding data analysis, because the dependent variable of consistent condom use has two outcomes as "yes" or "no", binary logistic regression is the appropriate method.

Results

Univariate Analysis

Table 1 displays the background characteristics of male youth respondents who ever used condoms in KDSS panel data in 2000 and 2004. The age of male youth respondents ranges from 19 to 24 in 2004. The mean age is 21.6 years old and standard deviation is 1.74 years. Majority of respondents are never married (64%). It is noticed that half of all the male youth respondents (51%) have higher than secondary school of education although majority of respondents (85%) live in rural areas. In addition, 71 percent of respondents never live in urban area more than one month in the last 12 months. Only 12 percent are still studying in school.

Table 1: Background characteristics of respondents in KDSS 2004

Variables	Number (N=180)	%
Age		
19	28	15.6
20	26	14.4
21	35	19.4
22	23	12.8
23	32	17.8
24	36	20.0
Marital Status		
Never Married	115	63.9
Ever Married	65	36.1
Place of Residence		
Urban	27	15.0
Rural	153	85.0
Urban Exposure		
Yes	52	28.9
No	128	71.1

Table 1: Background characteristics of respondents in KDSS 2004 *(Continued)*

Variables	Number (N=180)	%
Education Level		
Less than secondary	51	28.3
Secondary	38	21.1
Higher than secondary	91	50.6
Occupation		
Student	22	12.2
Agriculture labor	68	37.8
Non-agriculture labor	79	43.9
No job	11	6.1
Mobile Phone User		
Yes	99	55.0
No	81	45.0
Internet User		
Yes	14	7.8
No	166	92.2

Moreover, more than half of respondents (55%) are mobile phone users. However, only 8 percent of respondents use internet and all of those internet users have higher than secondary education.

Table 2 displays the knowledge score on total 9 types of contraceptive methods, namely, female sterilization, vasectomy, implant (nor plant), injection, IUD, pills, condom, withdrawal, and rhythm method. The knowledge score is measured by interval level and ranges from 1 to 9. The mean score is 6.4 and standard deviation is 2.20. Among 180 respondents, 17 percent know all the nine type of contraceptive methods.

Table 2: Number and percentage distribution of selected sexual experience and knowledge related condom use (N=180)

Characteristics	Number	%
Knowledge score on contraceptive method (T=9)		
1-3	25	13.9
4-6	50	27.8
7-9	105	58.3
(Mean=6.4, SD=2.20)		

Table 2: Number and percentage distribution of selected sexual experience and knowledge related condom use (N=180) *(Continued)*

Characteristics	Number	%
Start age of first using condom		
14	2	1.1
15-19	143	79.5
20-23	35	19.4
(Mean=17.8, SD=1.79)		
Reason of first using condom		
Birth control	92	51.1
Prevent infection	78	43.3
Birth control and prevent infection	5	2.8
Try out/Protect foul	5	2.8
Sexual partner		
Regular	37	20.6
Casual	33	18.3
Unknown (No answer)	110	61.1
Ever use condom before/in 2000		
Yes	38	21.1
No	142	78.9

The age of first time using condoms is measured by interval level in this study and ranges from 14 to 23 years old. The mean age of start is 17.8 and standard deviation is 1.79 years. Regarding the main reason of using condom at the first time, more than half of male youth (51%) reported for preventing pregnancy, and 43 per cent used condoms for preventing infections. Concerning the sexual partners with whom using condoms recently, 39 per cent of respondents responded this issue. The percentage of respondents who used condoms with regular partners is similar to those who used condoms with casual partners. Among 180 respondents who ever used condoms, majority of them (79%) are new users starting after the year of 2000.

Table 3 displays the selected realms of life change events which are important shift for youths. From 2000 to 2004, 22 percent of male youth respondents got married although majority of respondents (64%) were still single. More than one third of male youth (34%) increased their education level. The similar percentage of respondents (36%) quitted schools. Fourteen percent of respondents changed their living place and 58 percent changed occupation from 2000 to 2004.

Table 3: Number and percentage distribution of male youth by selected life changes between 2000-2004

vCharacteristics	Number (N=180)	%
Marriage Change		
Remain single	115	63.9
Still married	18	10.0
New married	40	22.2
Get divorced/separated/widowed	7	3.9
Education Change		
Increased	61	33.9
Not increased	119	66.1
Residence Change		
Yes	25	13.9
No	155	86.1
Occupation Change		
Yes	105	58.3
No	75	41.7
Quit School		
Yes	64	35.6
No	116	64.4

Bivariate Analysis

Table 4 presents the association between consistent condom use and selected socio-demographic characteristics of male youth respondents. Among all the background factors shown in the table, only marital status in 2004 and using mobile phone have significant relationship with consistent condom use at the level of 0.01. In addition, occupation in 2004 has significant relationship with consistent condom use at the level of 0.10.

Table 4: Crosstabulation of selected socio-demographic factors and consistent condom use (N=180)

Characteristics	Consistent Condom Use (%)			
	Yes	No	Total	χ^2
Over All	**18.3**	**81.7**	**100.0**	
Marital Status in 2004**				7.694
Never married	24.3	75.7	100.0	
Ever married	7.7	92.3	100.0	

Table 4: Crosstabulation of selected socio-demographic factors and consistent condom use (N=180) *(Continued)*

Characteristics	Consistent Condom Use (%)			
	Yes	No	Total	χ^2
Place of Residence in 2004				0.321
Rural	17.6	82.4	100.0	
Urban	22.2	77.8	100.0	
Education Level in 2004				0.308
Lower than secondary	17.6	82.4	100.0	
Secondary	15.8	84.2	100.0	
Higher than secondary	19.8	80.2	100.0	
Occupation in 2004†				6.458
Student	36.4	63.6	100.0	
Agriculture labor	19.1	80.9	100.0	
Non-agriculture labor	13.9	86.1	100.0	
No job	9.1	90.9	100.0	
Urban Exposure				0.051
Yes	17.3	82.7	100.0	
No	18.8	81.2	100.0	
Mobile Phone User**				7.035
Yes	25.3	74.7	100.0	
No	9.9	90.1	100.0	
Internet User				3.063
Yes	35.7	64.3	100.0	
No	16.9	83.1	100.0	

† $p<0.10$ ** $p<0.01$

In terms of marital status, male youths who are never married have significantly higher percentage of consistent using condoms compared with respondents who are ever married. Compared with male youth who work in agriculture or non-agriculture or not work at all, male youth students have the highest percent of consistent using condoms (36%). Those non-student male youths without job have the lowest percentage of consistent condom usage. In addition, among male youth respondents who used mobile phones the proportion of using condoms consistently is two times higher than their counterparts (25% vs. 10%).

Table 5 displays the relationship between consistent condom use and condom use experience. Among all the factors shown in Table 4-5, only sexual partner has significant relationship with consistent condom use at the level of 0.001. That is, male youth respondents who use condoms with casual partners have higher percentage of using condoms consistently than those have sex with regular partners.

Table 5: Crosstabulation of condom use experience with consistent condom use (N=180)

Characteristics	Consistent Condom Use (%)			
	Yes	No	Total	χ^2
Over All	**18.3**	**81.7**	**100.0**	
Reason of first using condom				2.755
Birth control	15.2	84.8	100.0	
Prevent infection	20.5	79.5	100.0	
Birth control & prevent infection	40.0	60.0	100.0	
Try out & protect foul	20.0	80.0	100.0	
Sexual partner (of condom use)* **				73.037
Regular	40.5	59.5	100.0	
Casual	54.5	45.5	100.0	
Unknown (No answer)	0.0	100.0	100.0	
Ever use condom before/in 2000				1.961
Yes	10.5	89.5	100.0	
No	20.4	79.6	100.0	

*** $p<0.001$

Table 6 reveals the relationship between selected life change events and consistent condom use. Within the five selected life change events in Table 4-6, only marital change have significant relationship with consistent condom use at the level of 0.05. There are no statistically significant association between consistent condom use and occupation change, education change, quit school, and residence change. Male youth respondents who are remain single have the highest percentage of using condom consistently than male youth who are married or have broken marriage (get divorced or separated or widowed).

Table 6: Crosstabulation of life changes and consistent condom use (N=180)

Characteristics	Consistent Condom Use (%)			
	Yes	No	Total	χ^2
Over All	**18.3**	**81.7**	**100.0**	
Marriage change*				7.953
Remain single	24.3	75.7	100.0	
Still married	5.6	94.4	100.0	
New married	7.5	92.5	100.0	
Get divorced/separated/widowed	14.3	85.7	100.0	

Table 6: Crosstabulation of life changes and consistent condom use (N=180) *(Continued)*

Characteristics	Consistent Condom Use (%)			
	Yes	No	Total	χ^2
Occupation change				0.010
Yes	18.1	81.9	100.0	
No	18.7	81.3	100.0	
Education increased				2.413
Yes	24.6	75.4	100.0	
No	15.1	84.9	100.0	
Quit school				0.012
Yes	18.8	81.2	100.0	
No	18.1	81.9	100.0	
Residence change				0.112
Yes	16.9	83.1	100.0	
No	19.0	81.0	100.0	

* $p<0.05$

Multivariate Analysis: Binary Logistic Regression

Table 7 displays the results of logistic regression. Model 1 is analyzed to assess the effect of basic socio-demographic characteristics as enabling factors on consistent condom use. In Model 2, sexual experience and knowledge on contraceptive methods as reinforcing factors are added. Continuously, the main interested life changes related variables as predisposing factors are added into the third model.

Concerning the relationship between socio-demographic factors and consistent condom use, in Model 1 only marital status and using mobile phone are significantly associated with consistent condom use at the level of 0.05 and 0.01, respectively. Male youth who are ever married are 71.8 percent less likely to use condoms consistently than male youths who are never married.

In Model 3, male youth living in urban areas are 121.5 times more likely to use condoms consistently than male youths living in rural areas. Regarding access to ICT, male youths who use mobile phones are 43.6 times more likely to use condoms consistently than male youths without using mobile phone. On the other hand, male youths who use condoms for preventing infections at the first time using are 9.3 times more likely to use condoms consistently compared with male youths who used condoms for preventing unwanted pregnancy. Male youths who used condoms with casual partners are 3.1 times more likely to use condoms consistently than with regular partners.

Table 7: Odds ratio of independent variables on consistent condom use by model

Independent variable	Odds Ratio	Odds Ratio	Odds Ratio
	Model 1	**Model 2**	**Model 3**
Age in 2004	0.919	1.375	1.344
Place of Residence in 2004			
Rural®			
Urban	1.603	5.827	121.480*
Education Level in 2004			
Lower than secondary®			
Secondary	0.585	0.702	0.548
Higher than secondary	0.513	0.209	0.178
Occupation in 2004			
Student	4.251	0.637	0.055
Agriculture labor	3.128	0.535	1.008
Non-agriculture labor	1.683	0.165	0.668
No job®			
Marital Status in 2004			
Never married®			
Ever married	0.282*	0.489	
Mobile Phone User	3.666**	5.473*	43.579**
Internet User	1.532	1.076	0.892
Urban Exposure	0.686	0.331	0.121
Knowledge on contraceptive methods		1.264	1.219
Start age of first using condom		0.906	1.086
Reason of first using condom			
Birth control®			
Prevent infection		4.480*	9.291*
Birth control & prevent infection		4.137	9.049
Try out & protect foul		1.946	1.484
Sexual partner			
Regular®			
Casual		1.543	3.132
Unknown		0.000	0.000
Ever use condom before/in 2000		0.509	5.757
Marriage Change			
Remain single®			
Still married			0.189
New married			1.034
Get divorced/separated/widowed			0.004*

Table 7: Odds ratio of independent variables on consistent condom use by model *(Continued)*

Independent variable	Odds Ratio	Odds Ratio	Odds Ratio
	Model 1	**Model 2**	**Model 3**
Education Change			28.016*
Quitting School			0.045†
Occupation Change			0.568
Residence Change			3.054
Cox & Snell R Square	0.120	0.410	0.449

† p<0.10 * p<0.05 ** p<0.01 ® = reference group

With regard to life change events, male youths with broken marriage (get divorced or separated or widowed) are 99.6 percent less likely to use condoms consistently than male youth who are still single. In addition, male youth with increased education are 28 times more likely to use condoms consistently compared with male youth without change of education. On the contrary, male youths who quitted school are 95.5 percent less likely to use condoms consistently than those male youths without experience of quitting school between 2000 and 2004. Last but not least, occupation change and residence change have no statistically significant relationship with consistent condom use.

Discussion

For all the respondents, the start age of using condoms ranges from 14 to 23. The mean age of start is 17.8. About 41 per cent of Thai male youths start to use condoms before 18 years old.

Concerning the main reason of using condoms at first time, majority of Thai male youths used for preventing unwanted pregnancy followed by preventing STIs, which reflects that youth consider unwanted pregnancy as more serious issue than STI and partially displays that male youths have lower risk perception of STI/HIV. On the other hand, male youths who used condoms for preventing infection at first time are significantly more likely to use condoms consistently in the future than those male youths who used condoms at first time only for family planning. Additionally, in the logistic regression analysis, there are no significant relationship between consistent condom use and knowledge on contraceptive methods, as well as the general education level. That is, risk perception on STI/HIV is a vitally important predictor of consistent condom use.

Regarding the modern information and communication technology namely mobile phone and the Internet, Thai male youth who use mobile phones are significantly more likely to use condom consistently than those who do not use mobile phones while using internet is not statistically significantly associated with consistent

condom use. Concerning the association between using condom and using mobile phone, maybe it is because male youth who use mobile phone have better communication with peers or sexual partners. In Stephen's study, communication with peers and relationship dynamics with sexual partners are identified as protective factors for male youth in their sexual practices (Stephen and Kennedy, 2007). In addition, young people who perceive their peer norms to support condom use are 2-3 times more likely to consistently use condoms than those who do not think their peers use condoms (Stevens, 1997). Meanwhile, male youth who use mobile phone may have better economic support and are informative to access to condoms than those male youth without mobile phones.

In terms of marital status in 2004 and marital change in the last 4 years, male youth who are married are much less likely to use condoms consistently than male youth who are never married. This finding is in agreement with many other researches. Usually, the rate of condom use is lower within marriage and consensual unions because they are more likely to be monogamous and trust to their partners. In Thailand the rate of condom use among married couples has never exceeded 2% because condoms are widely perceived as interfering with males' sexual pleasure and they are primarily considered to be used with prostitutes (Knodel, 1996). Logistic regression shows that male youth who have broken marriage (get divorced or separated or widowed) are much less likely to use condoms consistently than male youth who are still single, which could be understood as male youth with broken marriage have less or no sexual intercourse and thus are less likely to use condoms.

Regarding education and contraceptive methods knowledge, in this study education level and knowledge on contraceptive methods are not significantly related with consistent condom use among Thai male youth, which is similar with the finding from Cameroon male youth studied by Meekers and Klein (2003). While increased education is a significant positive factor impacting on consistent condom use. In other words, male youths with increased education are more likely to use condoms consistently than male youth without education change.

Quitting school is also an important event for youths as the turning-point of life and shift of social roles. In this study, quitting school is a significant negative factor influencing consistent condoms use. This is maybe because there are some programs such as health education course and the influence of peer educators in schools to promote condom use among students (Fongkaew, 2006). When quitting school, this kind of protective environment factors will be out of action.

With regard to occupation change, there is no significant relationship with consistent condom use in this study. As well as occupation status is also not significantly related to consistent condom use in the logistic regression. This finding is consistent with previous researches (Guaykietikul, 1994).

In this study, residence change is not significantly associated with consistent condom use. However, male youths who live in urban areas are much more likely to use condoms consistently than their counterparts. This finding is accordant with the results of other researches (e.g. Hensel, 2006).

Conclusion

In this study, among all of 180 respondents aged 19-24 who ever used condoms, only 18 per cent of them use condoms consistently in last twelve months. The mean age of first time using condom is 17.8 years old and majority of male youths use condoms at the first time for preventing unwanted pregnancy.

Results of logistic regression analysis display that male youth who are single, live in urban areas, and have higher risk perception of STI/HIV are significantly prone to use condoms consistently compared with their counterparts. Moreover, male youths who are mobile phone users are more likely to use condoms consistently.

Regarding the impact of life change on consistent condom use, increased education has significantly positive effect on consistent condom use, while broken marriage (get divorced or separated or widowed) and quitting school are negative factors. Moreover, occupation change and residence change are not statistically significantly associated with consistent condom use.

Policy Recommendation

1. Married male youth are less likely to use condoms consistently compared with single male youth. HIV/AIDS prevention program may include married male youth to promote condom use. HIV counseling and testing could be promoted when registering marriage and divorce.
2. This study finds that when male youth quitting school the probability of using condoms consistently is less. Therefore, HIV/AIDS intervention may be provided before male youth leave school.
3. Mobile phone and the Internet are increasingly popular among young people. Nowadays, HIV/AIDS intervention based on the Internet are appealing in Thailand. Considering that the rate of owning mobile phone is higher than the rate of owning Internet, and, on the other hand, compared with using mobile phone, using Internet needs higher education and knowledge on computer and Web, as well as better economic support. Thus, it may consider that it is feasible to provide mobile phone-based HIV/AIDS intervention.

Recommendation for Further Research

1. The present study is a pilot or tentative study to combine life change events with consistent condom use through Life Course Theory. In this study, life change events occurred between 2000 and 2004. That is, the time between the fifth round of census and the occurrence of some life changes selected in this study is probably longer than one year, which maybe influences the effect of predicting consistent condom use. The

further research could conduct new surveys and control the interval time to test the impact of life change on consistent condom use.

2. The secondary data were collected by face-to-face interviews. Considering that the topic of sexual behavior is still sensitive in Thai society, it is not surprising that the method of face-to-face interview may cause underreporting concerning, particularly if the interview environment is not so confidential. Therefore, a more systematic research method may reduce the error.

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Evaluating the Impact of Health Card Program on Access to Reproductive Health Services: An Indonesian Experience

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Abstract

Health card program aims to protect the poor in Indonesia during the Asian economic crisis. Health cards were targeted and allocated exclusively to the poor that would provide free access to public health services. The impact of health card program to reproductive health services was rarely discussed by previous studies that pay more attention on health card utilization for both inpatient and outpatient. Using Indonesian family life survey (IFLS) data 1997-2000 from RAND Corporation, this study aims to evaluate the impact of health card program during Asian economic crisis on access to reproductive health services and answer the question whether who had health card really have better access to reproductive health services. Discussion in this paper limit on antenatal care, place of delivery and contraceptive use which are only reproductive health components that covered by health card program. Using combination between descriptive analysis and multivariate analysis, this study found that the health cards were not well targeted and distributed. The study also found that, generally, there is no significant effect of health card ownership to access to reproductive health services.

Keyword: Health Card, Antenatal Care, Contraceptive, Place of Delivery

Introduction

Background of Study

The Indonesian economic crisis began in 1997 when the rupiah depreciated rapidly and brought Indonesia into the economic crisis of 1998. The devaluation of the rupiah increased levels of debt of private companies as well as increased operational cost resulting in bankruptcies. These conditions stimulated a reduction in labor demand, rising unemployment, and, indirectly, a loss of social security coverage. Prices of goods and services increased greatly during the year, which decreased quality of life the lower income population as well as pushed lower middle income population to be below population line (Strauss et al, 2002; Frankenberg et al, 2002; Pritchett and Suryahadi, 2002; Sparrow, 2006).

The crisis negatively affected the health sector from both supply and demand sides. For the supply side, WHO (1998) and AUSAID (2002) reported that the Indonesian provinces and district health offices experienced a reduction in operating budgets, which resulted in a cut in the budget for preventive programs. According water et al (2003) and AUSAID (2002), health services providers faced the increasing in operation costs, extraordinary increasing in pharmaceutical and medical supplies costs, and reduced supplies of modern health services. On the demand side, the severity of the crisis affected households' health care utilization and expenditures. Frankenberg et al. (2002) and AUSAID (2002) found that household consumption was going down in 1998, with decreasing investments in human capital (health and education) as well as decreasing utilization of modern health care services.

In response to the crisis, there were a series of publication about social safety net programs that were initiated or reconfigured in Indonesia. Some of programs were designed to reach all population and some were targeted to reach the poor only (Strauss, 2002). The health component of the Indonesian Social Safety Net program, the health card program, was started in September 1998 and initiated to protect the poor from the effects of the economic crisis through a targeted price subsidy and a public spending component. The health cards entitled all household members to the price subsidy at public health care providers. (Saadah et al, 2001; AUSAID, 2002; Sparrow, 2006; Somanathan 2008)

Most of previous studies on the impact health cards for protecting the poor during Indonesian economic crisis focus on targeting of health cards distribution (Lanjauw et al 2001; Pritchett and Suryahadi, 2002; Sparrow, 2006; and Sparrow, 2008) and utilization of health cards and its impact to outpatient (Saadah et al, 2001; Sparrow, 2006; Saadah et al, 2007). Other studies focus on the impact of health cards on children's health care (Somanathan, 2008) and health care consumption (Johar, 2007).

The issues were rarely discussed in previous Indonesia cases studies. Therefore, this thesis focus on the impact of the health card program on access to reproductive health services like contraception, pre-natal care and assistance at birth. Base on discussion above, we can hypothesize the health cards were distributed accurately to targeted beneficiaries and used it as purposes. We also expect that who received health cards should have better access to reproductive health services.

Research question on this paper focus on to answer the question did the poor who had health card really have better access to reproductive health services? If so why? If not, Why not? From the research questions, the research objective as follow:

- General Research objective: Evaluating the impact of the health card program on access to reproductive health services like access to contraception, pre-natal care and assistance at birth.
- Specific Research Objectives:
    - Measure the performance of health card's targeting and distribution.
    - Exploring the utilization of health card for reproductive health services.
    - Evaluating whether the poor who have health card have better access to reproductive health services or not.

Research Hypothesis

- Health cards were received by the poor only.
- Health cards utilized by the poor as intended.
- The poor who have health card have better access to reproductive health service

Literature Review

Social Safety Net-Health Card Program In Indonesia

Program Design

The health component of the Indonesian Social Safety Net program (JPS-BK), health cards program, was designed to prevent the decline of health and nutritional status as a result of the economic crisis. The community health centers (Puskesmas) and the village midwives are the key actors of the program. The health card program was designed to allow poor households to obtain at least basic health care services. As demand side intervention, the health card provides access to health services to the program beneficiaries by the use of a health card (Strauss et al, 2002; Sparrow, 2006).

According Saadah et al (2001) Strauss et al (2002) Sparrow (2006), the types of services covered by the health card include:

a) Basic health services, medical attention as first treatment or referrals, family planning services, immunization and other basic health services.
b) Basic maternal health care and referrals for pregnant mother, delivery care, post and neo-natal natal care.
c) Nutritional improvement through food supplementation to undernourished poor families.
d) Eradication of communicable diseases such as malaria, tuberculosis and diseases that could be prevented through immunization.
e) Revitalization of Posyandu (integrated health post), a health post improvement program to prevent negative effects of the crisis on the nutrition and health status of mothers and young children.

Distribution and Implementation

The health card program followed a partly decentralized targeting process, involving both geographic targeting at district level and community based individual

targeting at village level. Households that were categorized as vulnerable to economic shocks were targeted to receive health cards. (Saadah et al, 2001; Sparrow, 2006)

The amount of subsidy for public health care providers to be distributed across districts and number of health cards to be issued base on National Family Planning Coordinator Agency (BKKBN) headcount's per-district. The headcount was calculated based on the survey data to investigated number of poor (Saadah et al, 2001; Sparrow, 2006)

At the district level committees were formed to deal with the allocation of funds to the health clinics, community health center (Puskesmas) and village midwives. The district committees were also responsible to allocate health cards and BKKBN's poverty measurement criteria guidelines to villages where the village leaders headed village allocation committees (Saadah 2001; Sparrow, 2006).

The poverty measurement criterias of BKKBN to identify targeted households is called "*prosperity measurement status* for identifies the poor based on who meet with one of the following criteria (Strauss, 2002; Sparrow, 2006), such as: unable to have 2 meals a day, unable to afford health services, the head of the household lost his job due to retrenchment or households with school age children drops out due to the crises

The village committees (consisting of village staff, family planning workers, village midwives, and community activists) distributed to the villagers base on the BKKBN's poverty criteria above. The identified poor households are given health cards signed by the head of the community health post (Posyandu) and the head of the village. This card is valid for one year and can be extended as long as the households meet those criteria (Strauss, 2002; Sparrow, 2006)

M&E Framework and Research Conceptual Framework

Because this thesis is a evaluation research, the monitoring and evaluation framework of the health card program (figure 2.2) is designed in order to develop research conceptual framework for this thesis. There are four components of monitoring and evaluation frameworks. First is program's input and process that provide summary of program activities (more detail information about health card program can be found at chapter 2.2), second is program's output, third is program's outcomes and fourth is program's goal.

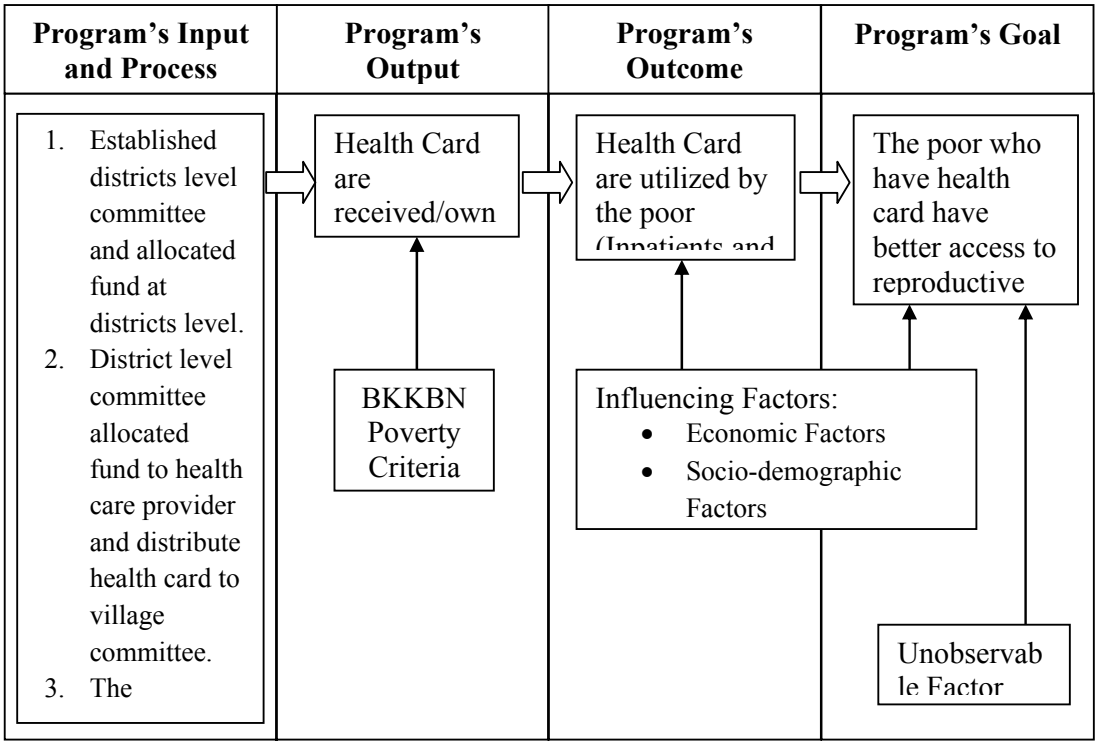

Figure 2.2: Monitoring and Evaluation Framework

On the figure 2.2 can be seen that this thesis focus on evaluating whether the health card program achieve the goal for improving access to reproductive health services or not.

This thesis is also investigating the program output (health card targeting and distribution) and the program outcomes (health card utilization) as well as the effect of the program output and program impact for achieving the program goal controlling by some independent variables.

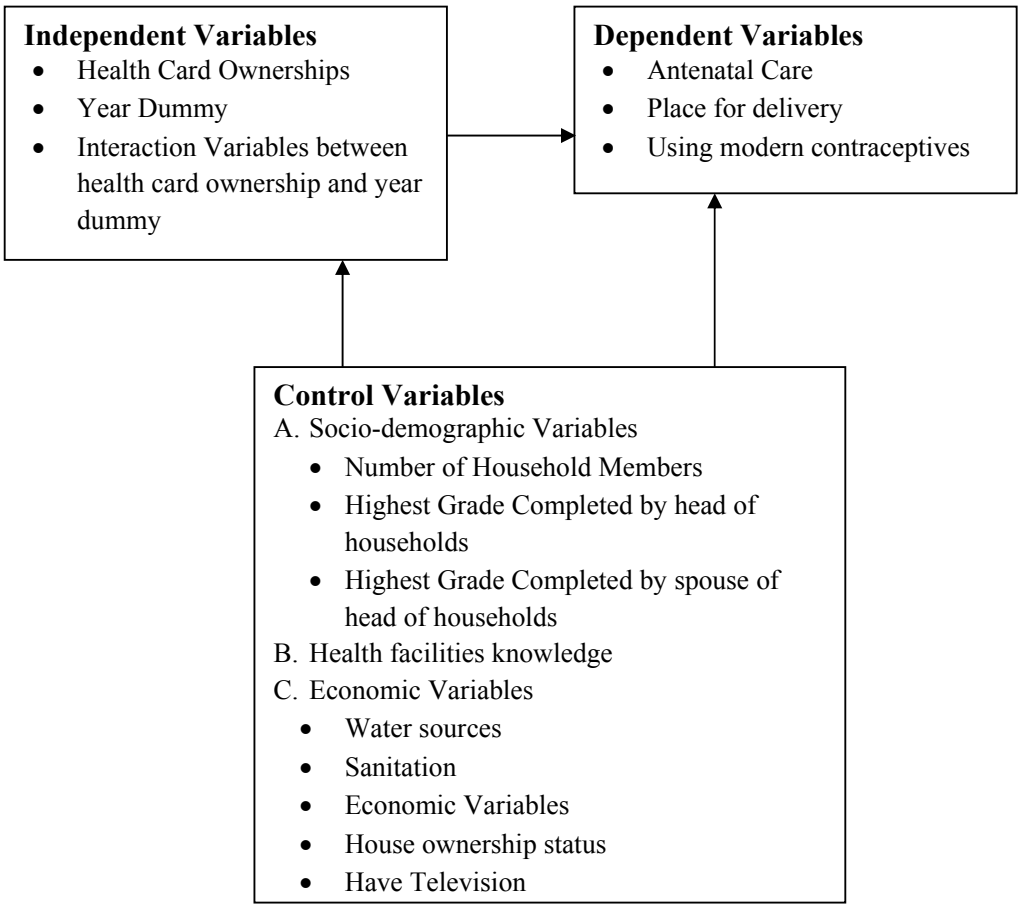

Figure 2.3: Research Conceptual Framework

Figure 2.3, research conceptual framework, shows the hypothetical relationship between dependent variables (program goal), program variables (program outcomes and program output) and independent variables.

Data and Methodology

Data

The major data source for this thesis is Indonesian Family Life Survey (IFLS) from RAND Corporation in Santa Monica, USA. The data is longitudinal survey data at household and community level. In this thesis, data at the household level is used because this thesis focuses on analysis from side. To investigate the impact of the health card, IFLS second wave (1997) is used as baseline data before intervention and IFLS third wave (2000) is used as post-intervention year. The sample size of IFLS second wave is 7619 Households and IFLS third wave is 10435 Households. For multivariate analysis, panel data are constructed from the longitudinal data.

For analysis, there are four versions of datasets. First is data set for descriptive analysis. The data is raw data set for univariate and bivariate analysis. Second is panel data set for indentifying the effect of independent variables and control variables to antenatal care. Third is panel data set for indentifying the effect of independent variables and control variables to place delivery, public health facility or the others.

The fourth is panel data set for indentifying the effect of independent variables and control variables to utilization modern contraceptives.

Methods

Two methods of analysis we employed in this study. Fist, descriptive statistics described the individual and households' characteristics, the descriptive statistics cover univariate and bivariate analysis. Second, Inference statistics cover bivariate and multivariate analaysis.

The multivariate analysis focuses on examining the effect of intervention and independent variables on dependent variables. The major approach for multivariate analysis in this thesis is identifying difference-in-difference estimator. To construct panel dataset for identifying difference and difference estimators, the new entries is taken out from 2000 data and take the drop out cases out from 1997 data and merging both dataset to create panel dataset for the multivariate analysis with consideration of sample selection bias. The bias was tested using logistic regression to identify whether the dropping case will change the characteristics of observation or not.

Result and Discussion

This chapter presents the interpretation and discussion from data analysis. Part three is divided as two parts: 4.1 provide descriptive analysis of health card ownership and utilization and 4.2 provide multivariate analysis of the impact of health card ownership to antenatal care, place delivery and modern contraceptive.

Descriptive analysis of health card ownership and utilization

As discussed on chapter two, the health card program followed a partly decentralized targeting process. Households that were categorized as vulnerable to economic shocks were targeted to receive health cards. It means health card allocated for the poor household to protect them from the effect of crisis (Saadah et al, 2001; Sparrow, 2006).

For evaluating the accuracy of targeting and allocation, wealth quintiles is use to identify the poor and non poor. The poorest and second poorest quintiles are categorized as poor, the rest quintiles are non poor or wealthier.

Wealth quintile in this study was constructed from economic variables such as using electricity, have television, own house, access to improve water, access to improve sanitation, asset and expenditure. Those variables were combined using principal component analysis.

Table 4.1: Tabulation between wealth quintiles and health card ownerships

Wealth Index Quintiles		hhs have kartu sehat	
		0. No	**1. Yes**
Poorest	**N**	1070	323
	%	18.82	25.25
Second	**N**	1076	317
	%	18.93	24.78
Middle	**N**	1135	257
	%	19.96	20.09
Fourth	**N**	1160	233
	%	20.40	18.22
Richest	**N**	1244	149
	%	21.88	11.65
Total	**N**	**5685**	**1279**
	%	**100.00**	**100.00**

Chi Square: Significant at 0.001

Table 4.1 shows that only 50% of all health cards were distributed to the poor (first and second poorest quintiles). The remaining health cards were miss-targeted and distributed to wealthier quintiles. The miss-targeting might be happen in local level when head of village that have rights to select who should receive health cards, gave health cards to head of villages' relatives or friends.

Table 4.2: Tabulation between wealth quintiles and health card utilization for inpatients

Wealth Index Quintiles		Use HC for Inpatient	
		0. No	**1. Yes**
Poorest	**N**	25	10
	%	5.33	50.00
Second	**N**	56	6
	%	11.94	30.00
Middle	**N**	72	3
	%	15.35	15.00
Fourth	**N**	128	1
	%	27.29	5.00
Richest	**N**	188	0
	%	40.09	0.00
Total	**N**	**469**	**20**
	%	**100.00**	**100.00**

Chi Square: Significant at 0.05

Table 4.2 shows that only 80% from who use health cards for inpatients were the poor (first and second poorest quintiles). The remaining health cards were miss-utilized by who were in wealthier quintiles and did not have rights to use health cards. Miss-utilization shows that there is no good verification system on health services

providers, when the providers allow who have health card get the free inpatient services even they are not the poor.

Table 4.3: Tabulation between wealth quintiles and health card utilization for outpatients

Wealth Index Quintiles		Use HC for Outpatient	
		0. No	1. Yes
Poorest	**N**	288	24
	%	13.17	26.37
Second	**N**	368	28
	%	16.83	30.77
Middle	**N**	442	16
	%	20.22	17.58
Fourth	**N**	494	20
	%	22.60	21.98
Richest	**N**	594	3
	%	27.17	3.30
Total	**N**	**2186**	**91**
	%	**100.00**	**100.00**

Chi square: significant at 0.01

Table 4.3 shows that only 57% from who use health cards for outpatients were the poor (first and second poorest quintiles). The remaining health cards were miss-utilized by who were in wealthier quintiles and did not have rights to use health cards. Miss-utilization shows that there is no good verification system on health services providers, when the providers allow who have health card get the free outpatient services even they are in a wealthier economic status.

Multivariate analysis

The Impact of health card ownership on antenatal care

To explore the impact of health card ownership on antenatal care, seven models of multiple regressions are used. Each model has different purposes that can be seen at the following explanation. The result of logistic regression of the following models can be seen at table 4.4.

Table 4.4: Regression coefficients and standard errors from multiple regression analysis of The impact of health card ownership on antenatal care.

Independent Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Standard Error)	Model 4 Coefficient (Standard Error)	Model 5 Coefficient (Standard Error)	Model 6 Coefficient (Standard Error)	Model 7 Coefficient (Standard Error)
health card ownership	-0.2324	-0.4496	-0.6261	-0.6010	-0.4128	-0.5927	-0.5497
	(-0.2587)	(0.4441)	0.4346	(0.4547)	(0.4594)	(0.4788)	(0.4617)
year dummy		-0.0190	-0.0992	-0.5205*	-0.1990	-0.6494*	-0.5157*
		(0.2236)	(0.2335)	(0.2617)	(0.2445)	(0.2869)	(0.2598)
Interaction variable		0.3214	0.4585	0.6937	0.3445	0.6180	0.6286
		(0.5515)	(0.5735)	(0.5721)	(0.5712)	(0.5964)	(0.5803)
know where is public hospital			0.2895			0.1565	
			(0.2508)			(0.2598)	
know where is private hospital			0.3395			0.0443	
			(0.2669)			(0.2758)	
know where is public/auxiliary health center			-0.7587			-0.8675	-0.7374
			(0.4712)			(0.4817)	(0.4666)
know where is private clinic			-0.2258			-0.3486	
			(0.3621)			(0.3812)	
know where is private physician			0.0622			-0.0130	
			(0.2456)			(0.2557)	
know where is midwife			0.5431*			0.5888*	0.7458**
			(0.2515)			(0.2645)	(0.2467)

Table 4.4: Regression coefficients and standard errors from multiple regression analysis of The impact of health card ownership on antenatal care. *(Continued)*

Independent Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Standard Error)	Model 4 Coefficient (Standard Error)	Model 5 Coefficient (Standard Error)	Model 6 Coefficient (Standard Error)	Model 7 Coefficient (Standard Error)
know where is nurse			0.1100			0.0799	
			(0.2339)			0.2436	
know where is traditional birth attendant			-0.0039			0.1634	
			(0.2537)			0.2683	
know where is traditional practicioner			-0.1673			0.0519	
			(0.2356)			0.2489	
know where is pharmacy			0.4012			0.2594	
			(0.2555)			0.2687	
know where is posyandu			0.5494			0.4888	
			(0.3003)			0.3109	
household size				0.1328**		0.1429**	0.1404**
				(0.0455)		(0.0488)	(0.0462)
highest education hhh				0.6898		0.4374	0.8667**
				(0.3614)		(0.3827)	(0.2963)
highest education shh				0.2672		0.3801	
				(0.3991)		(0.4259)	
house ownership					0.2929	0.2207	
					0.2585	(0.2758)	

Table 4.4: Regression coefficients and standard errors from multiple regression analysis of The impact of health card ownership on antenatal care. *(Continued)*

Independent Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Standard Error)	Model 4 Coefficient (Standard Error)	Model 5 Coefficient (Standard Error)	Model 6 Coefficient (Standard Error)	Model 7 Coefficient (Standard Error)
using electricity					0.5194	0.3793	
					0.3034	(0.3294)	
have television					0.2620	0.1177	
					0.2338	(0.2572)	
improve water source					0.3223	0.2873	
					0.2208	(0.2427)	
improve sanitation					-0.2191	-0.1609	
					(0.2311)	(0.2468)	
constant	0.5279***	0.5366***	0.0497	-0.3383	-0.2385	-1.3268	-0.2671
	0.1114	0.1515	0.5366	0.3222	0.3755	0.7053	0.5632
Log Likelihood	-278.7017	-278.5184	-267.1242	-269.4201	-272.1993	-256.7999	-263.9404
N	420	420	420	420	420	420	420
LR Chi2	0.80	1.17	23.96	19.36	13.81	44.60	30.32
Prob>Chi2	0.3709	0.7609	0.0464	0.0036	0.0870	0.0030	0.0001
Pseudo R2	0.0014	0.0021	0.0429	0.0347	0.0247	0.0799	0.0543

= Significant at 0.05; **= Significant at 0.01; *=Significant at 0.001*

Model 1 on table 4.4 shows that there is no direct effect of health card ownership on antenatal care without controlling for other factors. The model is also not significant that shown by prob>chi2 more than 0.05.

Model 2 shows that there is no effect of health card ownership and dummy of program interventions periods as well as there is no combination effect between health card ownership and program duration on antenatal care without controlling for other factors. The model is also not significant that shown by prob>chi2 more than 0.05.

Model 3 show that there is no effect of health card ownership and dummy of program interventions periods as well as there is no combination effect between health card ownership and program duration on antenatal care controlling for knowledge of health facilities. In this model, can be seen that knowledge of where is midwife have significant effect on adequate antenatal care.

Model 4 show that there is no effect of health card ownership and dummy of program interventions periods as well as there is no combination effect between health card ownership and program duration on antenatal care controlling for socio-demographic variables. In this model can be seen household size have significant factor of antenatal care.

Model 5 show that there is no effect of health card ownership and dummy of program interventions periods as well as there is no combination effect between health card ownership and program duration on antenatal care controlling for economic variables. Model 5 also shows that there is no effect of economic factor on antenatal care.

Model 6 show that there is no effect of health card ownership as well as there is no combination effect between health card ownership and program duration on antenatal care controlling for all variables including knowledge of health facilities, socio-demographic and economic variables. But there is significant effect of dummy of program interventions periods (before and after). Consistent with model 3 and model 4, there is positive effect of knowledge where is midwife and household size.

Model 7 show that there is no effect of health card ownership as well as there is no combination effect between health card ownership and program duration on antenatal care controlling for selected knowledge of health facilities variables, socio-demographic variables and economic variables. Consistent with model 6, there is significant effect of dummy of program interventions periods (before and after). Consistent with model 3, model 4 and model 6, there is positive effect of knowledge where is midwife and household size.

Impact of health card ownership to place delivery

To explore the impact of health card ownership on place of delivery, seven models of multiple regressions are used. Each model has different purposes that can be seen at the following explanation. The result of logistic regression of the following models can be seen at table 4.5

Model 1 on table 4.5 show that there is no direct effect of health card ownership on place of delivery without controlling for other factors. The model is also not significant that shown by prob>chi2 more than 0.05.

Model 2 show that there is no effect of health card ownership and dummy of program interventions periods as well as there is no combination effect between health card ownership and program duration on place of delivery without controlling for other factors. The model is also not significant that shown by prob>chi2 more than 0.05.

Model 3 show that there is no effect of health card ownership and dummy of program interventions periods as well as there is no combination effect between health card ownership and program duration on place of delivery controlling for knowledge of health facilities. In this model, can be seen that knowledge of where is public hospital have significant positive effect on delivery at public health facilities. In this model also can be seen that knowledge of where traditional birth attendants are has significant negative effect on delivery at public facilities. Interestingly, knowledge where traditional practitioners are has significant effect to delivery at public health facilities.

Model 4 show that there is no effect of health card ownership and dummy of program interventions periods as well as there is no combination effect between health card ownership and program duration on place of delivery controlling for socio-demographic variables. In this model can be seen that there is no socio-demographic variables have significant effect to delivery in public facilities.

Table 4.5: Regression coefficients and standard errors from multiple regression analysis of the impact of health card ownership on place delivery.

Independent Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Standard Error)	Model 4 Coefficient (Standard Error)	Model 5 Coefficient (Standard Error)	Model 6 Coefficient (Standard Error)	Model 7 Coefficient (Standard Error)
health card ownership	0.0424	0.0232	-0.8342	0.0440	-0.3945	-0.7806	-0.6049
	(0.4213)	(0.7954)	(0.8902)	(0.8026)	(0.8442)	(0.9351)	(0.8531)
year dummy		0.3486	0.3896	-0.0236	0.2484	0.3213	0.4831
		(0.3678)	(0.4173)	(0.4267)	(0.4345)	(0.5734)	(0.4451)
Interaction variable		-0.0883	0.5042	0.0406	0.5282	0.3812	0.5562
		(0.9442)	(1.0641)	(0.9716)	(1.0082)	(1.1445)	(1.0491)
know where is public hospital			2.2773**			2.1345**	2.3300**
			(0.7720)			(0.7944)	(0.7537)
Know where is private hospital			0.3339			0.3576	
			(0.4166)			(0.4616)	
know where is public/auxiliary health center			-0.1157			-0.2828	
			(0.7791)			(0.8799)	
know where is private clinic			-0.5605			-1.0420	
			(0.6183)			(0.6697)	
know where is private physician			-0.3669			-0.5995	
			(0.4087)			(0.4509)	
know where is midwife			-0.4558			-0.2954	
			(0.4569)			(0.5076)	

Table 4.5: Regression coefficients and standard errors from multiple regression analysis of the impact of health card ownership on place delivery. *(Continued)*

Independent Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Standard Error)	Model 4 Coefficient (Standard Error)	Model 5 Coefficient (Standard Error)	Model 6 Coefficient (Standard Error)	Model 7 Coefficient (Standard Error)
know where is nurse			-0.4844			-0.4415	
			(0.4528)			(0.4738)	
know where is traditional birth attendant			-1.3987**			-1.3506**	-1.2259***
			(0.4070)			(0.4450)	(0.3844)
know where is traditional practicioner			0.9254*			1.2074**	0.7666*
			(0.4174)			(0.4614)	(0.3877)
know where is pharmacy			0.5207			0.2895	
			(0.4351)			(0.4893)	
know where is posyandu			1.1049			1.2418	
			(0.6522)			(0.6988)	
household size				0.0678		-0.0081	
				(0.0650)		(0.0746)	
highest education hhh				-0.5524		-1.0147	-0.5232
				(0.5611)		(0.6286)	(0.4913)
highest education shh				1.4414*		1.3266*	
				(0.5623)		(0.6426)	
house ownership					0.7112	1.0392	
					(0.5236)	(0.5985)	

Table 4.5: Regression coefficients and standard errors from multiple regression analysis of the impact of health card ownership on place delivery. *(Continued)*

Independent Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Standard Error)	Model 4 Coefficient (Standard Error)	Model 5 Coefficient (Standard Error)	Model 6 Coefficient (Standard Error)	Model 7 Coefficient (Standard Error)
using electricity					1.6348	1.0987	
					(1.0599)	(1.1177)	
have television					0.7474	0.7025	0.7400
					(0.4117)	(0.5035)	(0.4171)
improve water source					0.8083*	0.5224	
					(0.3648)	(0.4480)	
improve sanitation					0.3706	0.2403	
					(0.4109)	(0.5075)	
constant	-1.9332***	-2.1026***	-3.9553***	-2.6038***	-5.1959***	-6.4359***	-4.0059***
	0.1835	0.2648	1.1710	0.5347	1.1707	1.7018	0.8412
Log Likelihood	-125.7808	-125.2846	-99.3196	-121.3882	-112.9377	-90.9328	-99.6007
N	330	330	330	330	330	330	330
LR Chi2	0.01	1.00	52.93	8.80	25.70	69.71	52.37
Prob>Chi2	0.9202	0.8007	0.0000	0.1854	0.0012	0.0000	0.0000
Pseudo R2	0.0000	0.0040	0.2104	0.0350	0.1021	0.2771	0.2082

= Significant at 0.05; **= Significant at 0.01; *=Significant at 0.001*

Model 5 show that there is no effect of health card ownership and dummy of program interventions periods as well as there is no combination effect between health card ownership and program duration on place of delivery controlling for economic variables. Model 5 also shows that there is no effect of economic factor on delivery in public facilities.

Model 6 show that there is no effect of health card ownership and dummy of program interventions periods as well as there is no combination effect between health card ownership and program duration on place of delivery controlling for all variables including knowledge of health facilities, socio-demographic and economic variables. Consistent with model 3, there is positive effect of knowledge of where is public hospital and knowledge where traditional practitioners are as well as significant negative effect of knowledge of where traditional birth attendant were on delivery in public facility.

Model 7 show that there is no effect of health card ownership and dummy of program interventions periods as well as there is no combination effect between health card ownership and program duration on place of delivery controlling for selected knowledge of health facilities variables, socio-demographic variables and economic variables. Consistent with model 3 and model 6, model 7 shows that there is positive effect of knowledge of where is public hospital and knowledge where traditional practitioners are as well as significant negative effect of knowledge of where traditional birth attendant were on delivery in public facility.

Impact of health card ownership to utilization of modern contraceptive

To explore the impact of health card ownership on place of delivery, seven models of multiple regressions are used. Each model has different purposes that can be seen at the following explanation. The result of logistic regression of the following models can be seen at table 4.6.

Model 1 show direct effect of having health cards on using modern contraceptives. People who have health card are more likely use modern contraceptive without controlling for other factors.

Model 2 show that there is positive effect of health card ownership and combination effect between health card ownership and program duration on utilization of modern contraceptives without controlling for other factors. Consistent with model 1, household who have health cards are more likely have use modern contraceptive.

Table 4.6: Regression coefficients and standard errors from multiple regression analysis of the impact of health card ownership on utilization of modern contraceptive.

Independent Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Standard Error)	Model 4 Coefficient (Standard Error)	Model 5 Coefficient (Standard Error)	Model 6 Coefficient (Standard Error)	Model 7 Coefficient (Standard Error)
health card ownership	0.1947**	0.4325***	0.3399**	0.4250***	0.3461**	0.3128**	0.3174**
	(0.0683)	(0.1114)	(0.1132)	(0.1114)	(0.1127)	(0.1139)	(0.1133)
year dummy		-0.1042	-0.1756**	-0.1697**	-0.1538*	-0.1793**	-0.1907***
		(0.0551)	(0.0567)	(0.0605)	(0.0606)	(0.0657)	(0.0567)
Interaction variable		-0.3530*	-0.2798	-0.3246*	-0.1961	-0.2068	-0.2036
		(0.1420)	(0.1441)	(0.1426)	(0.1440)	(0.1453)	(0.1447)
know where is public hospital			0.1237*			0.0843	
			(0.0626)			(0.0636)	
Know where is private hospital			0.0314			-0.0067	
			(0.0625)			(0.0634)	
know where is public/auxiliary health center			0.1867			0.1850	
			(0.1098)			(0.1105)	
know where is private clinic			0.0266			-0.0139	
			(0.0780)			(0.0794)	
know where is private physician			0.0959			0.0534	
			(0.0597)			(0.0608)	
know where is midwife			0.1942**			0.1992**	0.2130***
			(0.0625)			(0.0629)	(0.0620)
know where is nurse			0.0832			0.0755	
			(0.0551)			(0.0554)	

Table 4.6: Regression coefficients and standard errors from multiple regression analysis of the impact of health card ownership on utilization of modern contraceptive.*(Continued)*

Independent Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Standard Error)	Model 4 Coefficient (Standard Error)	Model 5 Coefficient (Standard Error)	Model 6 Coefficient (Standard Error)	Model 7 Coefficient (Standard Error)
know where is traditional birth attendant			-0.0866			-0.0133	
			(0.0595)			(0.0617)	
know where is traditional practicioner			-0.2168***			-0.1956***	-0.1878***
			(0.0570)			(0.0574)	(0.0566)
know where is pharmacy			0.0940			0.0241	0.0786
			(0.0639)			(0.0654)	(0.0562)
know where is posyandu			0.4369			0.4366	0.4676***
			(0.0710)			(0.0714)	(0.0683)
household size				-0.0049		-0.0097	
				(0.0117)		(0.0119)	
highest education hhh				0.0938		-0.0669	
				(0.0795)		(0.0832)	
highest education shh				0.1404		0.0239	
				(0.0923)		(0.0953)	
house ownership					-0.1263	-0.1159	
					(0.0734)	(0.0758)	
using electricity					0.0263	-0.0534	
					(0.0851)	(0.0870)	
have television					0.3906***	0.3512***	0.3531***
					(0.0588)	(0.0626)	(0.0583)

Table 4.6: Regression coefficients and standard errors from multiple regression analysis of the impact of health card ownership on utilization of modern contraceptive.*(Continued)*

Independent Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Standard Error)	Model 4 Coefficient (Standard Error)	Model 5 Coefficient (Standard Error)	Model 6 Coefficient (Standard Error)	Model 7 Coefficient (Standard Error)
improve water source					0.1410**	0.1406	0.1417**
					(0.0548)	(0.0575)	(0.0549)
improve sanitation					0.0074	-0.0141	
					(0.0565)	(0.0574)	
constant	0.1258***	0.1756***	-0.5620***	0.1959**	-0.0420	-0.5882***	-0.6045***
	0.0275	0.0381	0.1202	0.0765	0.1086	0.1634	0.0825
Log Likelihood	-4377.6903	-4369.7141	-4305.5943	-4365.5847	-4328.3262	-4282.4358	-4288.5722
N	6350	6350	6350	6350	6350	6350	6350
LR Chi2	8.18	24.13	152.37	32.39	106.91	198.69	186.41
Prob>Chi2	0.0042	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pseudo R2	0.0009	0.0028	0.0174	0.0037	0.0122	0.0227	0.0213

= Significant at 0.05; **= Significant at 0.01; *=Significant at 0.001*

Model 3 show that there is positive effect of health card ownership and but there is no combination effect between health card ownership and program duration on utilization of modern contraceptives controlling for knowledge of health facilities. Consistent with model 1 and 2, household who have health cards are more likely have use modern contraceptive. But the periods variable show that household in 2000 are less likely use modern contraceptive. The model also show positive effect of knowledge of where is public hospital, midwife, traditional practitioners and posyandu are on utilization modern contraceptives

Model 4 show that there is positive effect of health card ownership and there is combination effect between health card ownership and program duration on utilization of modern contraceptives controlling for socio-demographic variables. Consistent with model 1, 2, and 3 household who have health cards are more likely have use modern contraceptive. Consistent with model 3, the year dummy show that household in 2000 are less likely use modern contraceptive. In this model also can be seen that there is no socio-demographic variables have significant effect to delivery in utilization of modern contraceptives.

Model 5 show that there is positive effect of health card ownership and dummy of program intervention periods, but there is no combination effect between health card ownership and program duration on utilization of modern contraceptives controlling for economic variables. Consistent with model 1, 2, 3 and 4, household who have health cards are more likely have use modern contraceptive. Consistent with model 3 and 4, the year dummy shows households in 2000 are less likely use modern contraceptive. The model also shows positive effect of having television and access to improve water on utilization modern contraceptives.

Model 6 show that there is positive effect of health card ownership and dummy of program intervention periods, but there is no combination effect between health card ownership and program duration on utilization of modern contraceptives controlling for all variables including knowledge of health facilities, socio-demographic and economic variables. Consistent with model 3, the model also show positive effect of knowledge of where is public hospital, midwife, traditional practitioners and posyandu on utilization modern contraceptives. Consistent with model 5, the model also shows positive effect of having television and access to improve water on utilization modern contraceptives.

Model 7 show that there is effect of health card ownership and but there is no combination effect between health card ownership and program duration on utilization of modern contraceptives controlling for selected knowledge of health facilities variables, socio-demographic variables and economic variable.

Table 4.7: Adjusted Probability of having Health card to utilization of modern contraceptive

Have health card	Number of Observation	Adjusted Probability	Standard Error
No (0)	5,299	0.5334	0.0279
Yes (1)	1,051	0.5730	0.0634
LR Chi2	5.37		
Prob>Chi2	0.0205		

Table 4.8: Interaction effect between health cards ownership and year dummy

Variables	N	Mean	Std.Dev.	Min	Max
ie	6,350	-0.0469	0.0036	-0.0517	-0.0410
se	6,350	0.0339	0.0016	0.0311	0.0358
z	6,350	-1.3788	0.0462	-1.5010	-1.3164

Adjusted probability result of health card ownership to modern contraceptive use show that 57% household that have health card will use modern contraceptive, it is clearly confirm that having health card is one of factor affecting the decision to use modern contraceptive during the crisis.

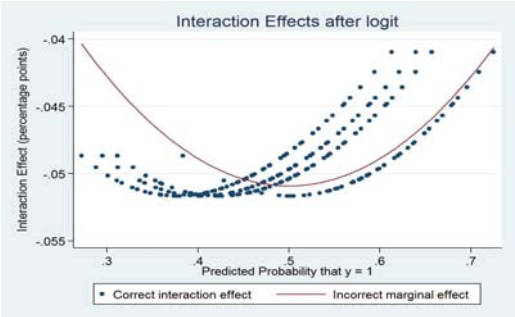

Figure 4.1: Interaction Effect

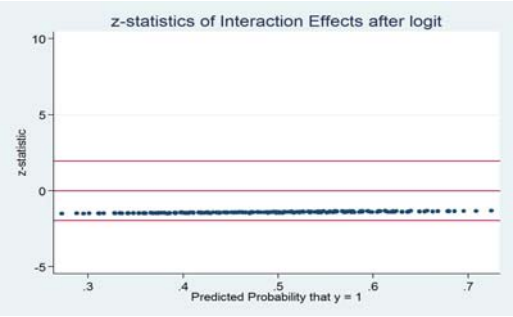

Figure 4.2: Z-statistics

From figure 4.1 can be seen the magnitude of interaction effect in wide range and vary depend on level of each covariates. The mean of interaction effect is -0.046 (Table 4.8). At figure 4.1 can be seen that the interaction effect can be found widely although none of them statistically significant according figure 4.2. It might be happen because from 1997 to 2000 is crisis periods, therefore the time effect of program intervention was neutralized by economic shock because of crisis.

From table 4.6 model 7 can be seen that both health card ownership and year dummy are highly statistically significant. However, the interaction variable is not statistically significant. From model 7, could be concluded that there is no interaction. It might be happen because from 1997 to 2000 is crisis periods, therefore the time effect of program intervention was neutralized by economic shock because of crisis.

The other possible answer why the interaction effect are not is significant to contraceptive use are stability of contraceptive use in Indonesia. This argument is supported by Strauss et al (2002) and Frankenberg et al (1999) who found that the economic crisis did not affect a lot on the change of contraceptive uses. It means that neither economic crisis nor health card program have significant effect to utilization modern contraceptives.

Conclusion and Recommendation

Chapter V is the conclusion of this study. There are two topic of this chapter, finding of the study and implication of this study

Conclusion

This paper not only found that the effectiveness of the program should be increase but also can be detect some part of the program that need to be improved. Some important point for the analysis as follow:

- Health card program have less performance on targeting and distribution.
- Health card program did not affect to secure adequate antennal care of pregnant women.
- Knowledge where midwives is very important in securing access to adequate antenatal care.
- Health card program did not affect giving more access on delivery to public health facilities
- Knowledge of where is public hospital is very important to improve access on delivery in public facility.
- Health card program have positive effect on modern contraceptive use but the interaction impact between health card ownership and year dummy is not significantly improve utilization modern contraceptive.
- Knowledge where public hospital, midwife, traditional practitioners and posyandu is very important to improve the utilization of modern contraceptive.
- Interestingly, economic factors are not major constraint for reproductive health access. It is need more study to answer why it is happened.

Recommendation

For Further Social Safety Net Program

1. Improve the quality of targeting and distribution for further social safety net on health program. Program implementer should have individual level data base of targeted recipient of safety net and did let local level official decided the recipient freely.
2. Improve the quality monitoring for implementation of further social safety net on health program to avoid misallocation.

For Further Research

3. Conduct study with more sample size of pregnant women or who have delivery, especially to investigate the impact social safety net on health to antenatal care and place delivery.
4. Conduct further study on stable macroeconomic situation, to reduce the bias because of the effect of business cycle fluctuation. It will be better if the study conducted with randomized evaluation methods to avoid selection bias.

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The Relationship between Menopause Symptoms and the Quality of life of Women in Ulaabaatar City, Mongolia

Gandolgor ULZIINOROV

Abstract

The purpose of this study is to illustrate women's quality of life and examine the relationship between menopause symptoms and the quality of life of women in Ulaanbaatar city, Mongolia. This is a sample survey with a cross-sectional design. Hospital-based data on the use of a structured self-administrated questionnaire were collected among 247 women aged between 45 and 65 years during the year 2005. Descriptive and bivariate (Chi-square and ANOVA test) analyses were applied to examine the relationship between menopause symptoms and women's quality of life components. Women's quality of life shows that the highest score was for the social component including such indicators as women's education level and work status. The lowest score was for the health component which comprises of body mass index and exercising practice. Regarding the health components, half of these women were overweight. The majority of women did not have regular exercise practices. The relationship between menopausal symptoms and women's quality of life shows that the severity of the menopausal symptoms, the number of current and postmenopausal symptoms were significantly related to the subjective quality of life of these women. The recommendations suggest that the promotion of healthy lifestyle for menopause women is an important challenge for enhancing women's quality of life. There is a necessity to introduce specific health care services for menopausal women such as stress management, psychological consultation and activities to promote social support for menopause women.

Introduction

Nowadays, the issues addressed to enhance the quality of life of women are becoming the important challenges because of global phenomenon of aging feminization. However, women live longer than men but they are more prone to socioeconomic, health related problems and aging process such as menopause. Particularly, the impact of menopause on quality of life could be a consequence of biological changes, associated symptoms, and/or socio cultural factors. Daly et al., (1993) has proposed that quality of life is severely compromised by the presence of menopausal symptoms and it indicates that the effects of these symptoms may have been underestimated. However, there are different points of view whether menopause influence quality of life of women or not. Some study findings supported that the menopause effect on women's life quality depends on the number and the severity of menopausal symptoms. Moreover, menopausal symptom experiences are different among nationalities even from individual to individual (WHO, 1996).

In Mongolia some preliminary study findings showed that the mean age of natural menopause is comparably younger 48.24 ± 2.9 (Battulga G. et al., 2005). In addition, menopause symptoms are common among Mongolian women. For instance, 64.1 percent of menopausal women have at least one menopause symptom (Ibid, 2005). Furthermore, life expectancy of Mongolian women has been increasing dramatically during the last few decades. By the latest statistics, life expectancy of Mongolian women is 70 and women aged over 50 make up 15 percent of population (MOH, 2005). In this respect, an important issue requiring both research and policy attention is the interdependence among women's economic, health, and social concerns, which increase with age (Tabloski, 2003). In Mongolia, among menopausal women, there is a little research on menopause and quality of life of women at a menopausal age.

Also, there is no appropriate health care during and after menopause due to lack of proper evidence about Mongolian menopause women's quality of life situation. Based on the above mentioned situation, in order to enhance women's well being during menopause periods there is a need to explore different contexts and situations particularly among Asian women. Accordingly, this study focuses on its aim to examine the relationship between menopausal symptoms and a quality of life of women living in Ulaanbaatar, the capital city of Mongolia.

Data and Methodology

Data were collected by cross-sectional hospital-based study using structured self-administered questionnaire method to recruit 247 women aged between 45 and 65 living in Ulaanbaatar City. In this study, socio-demographic variables include age, marital status and different menopausal periods (pre, peri and post), a severity level, number of experienced symptoms, and perception of knowledge, attitude towards menopause were considered as independent variables. Specific four components of quality of life, namely social support, health, economic and psychological were treated as the dependent variables. In order to describe menopausal variables and women's quality components, descriptive statistics as a frequency, percentage, means and standard deviations are used. Comparisons between the different groups in terms of background characteristics, menopause different manifestations, were tested by applying the chi square test for categorical independent variables and the analysis of variance (ANOVA) for continues variables.

Results and Discussion

Description of Background, Menopausal characteristics

The mean age of the study subjects is 51.4 (standard deviation is 5.07). The majority of menopausal women (75.3 percent) are married. Only few of them (24.7 percent) are not currently married including separated, divorced, widowed, and never married women.

The menopause is divided into 3 periods by the women's last menstrual history such as a premenopausal, perimenopausal and postmenopausal periods by WHO recommendation (WHO, 1996). In this study, over half of the study participants (56.7 percent) belongs to postmenopausal and the rest belongs to the pre and perimenopausal periods (27.5; 15.8 percent respectively) regarding to their last menstrual history (See figure 1).

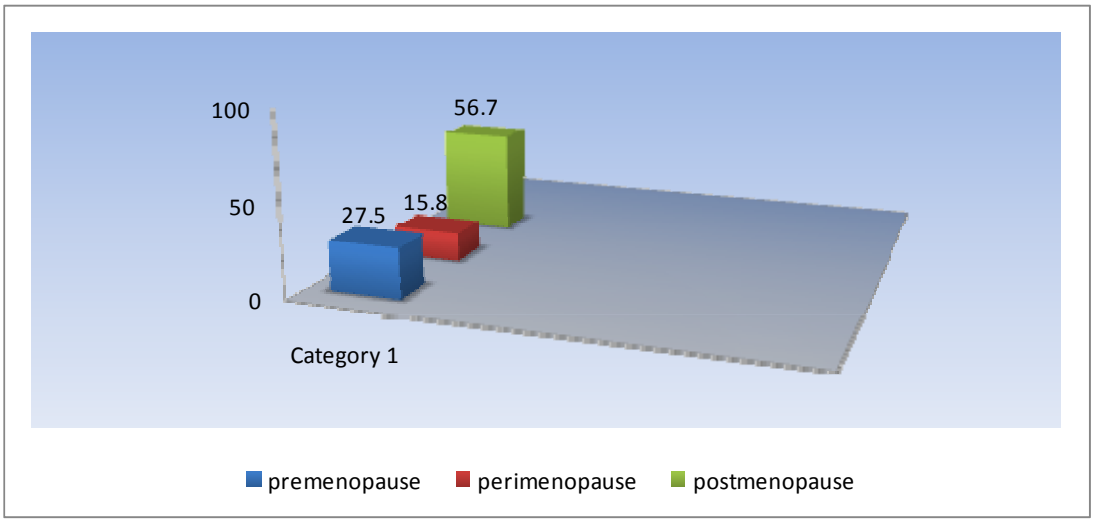

Figure 1: Percentage distribution of menopause period of women

Menopausal symptoms are measured with regards to two dimensions including the number of symptoms experienced and severity level of each symptom. Generally, seven out of ten (75.3 percent) of participants have at least one menopausal symptom as presented in Table 1.

Table 1: Percentage of menopausal symptoms (N=247)

Menopause symptoms	Percentage
Menopausal symptoms (at least one symptom)	**75.3**
Physical and mental exhaustion	60.3
Joint and muscular pains	45.0
Heart palpitations	36.8
Depressive mood	36.8
Hot flushes	35.0
Anxiety	32.7
Irritability	27.9
Sleep problems	25.9
Bladder problems	21.1
Dryness of vagina	8.1

Furthermore, the data in Table 1 shows that the most dominated symptoms among these women are physical and mental exhaustion (60.3 percent), joint and muscular pains (45.0 percent), depressive mood (36.8 percent) and heart palpitations (36.8 percent). In this study severity level is not measured by menopausal periods due to small sample size. We mostly focused on overall state of severity of menopausal symptom of participants. Therefore, over half of the women (60 percent) enrolled in this study are reported to have low level of severity while a few of them (3.2 percent) have symptom with severe level.

Overall, the experienced menopausal symptoms is comparably higher (75.3 percent) among these women compared with the study findings of by Laxminarayana et al, (2009) which reported that among Asian women from different ethnic backgrounds, menopausal symptom prevalence rates range between 10–40 percent. However, a study by Huong (2001) conducted among postmenopausal Vietnamese women in Hanoi indicated very high prevalence (99.5 percent) of menopausal symptoms. It might be related to many possible reasons such as the study methodology and other related factors. Nonetheless, the pattern of symptoms is quite similar with other study results which were conducted in Asian context. Similarly, this present study found that the most three common reported symptoms are psychological, physical and mental exhaustion (60.3 percent) followed by joint and muscular pains (45.0 percent).

Description of the Women's Quality of Life and its Components

Based on the available data set and previous study results, in this study menopausal woman's quality of life comprises four components namely social support, health, economic and psychological.

1. **Social support component**

The social support component of menopausal women reflects their social well-being particularly job and life satisfaction. This comprises of 2 indicators such as women's educational level and current work status. Overall, the education level of the respondents is quite high. Nearly half of them have (41 percent) technical and one-third (38 percent) have university level of education. All of the respondent have some

form of education. The majority of women (78.1 percent) enrolled this study have work.

2. Economic component

By human development theory, economic situation of individual's is considered as a one of important component of basic human needs and measured at different hierarchical level from individual to whole country. In this study, women's economic component comprises of one indicator (current income satisfaction) that can be considered as an individual's subjective perception. Nearly two-thirds of the respondents (68 percent) are not satisfied with their current income.

3. Health component

Regarding to literature review (WHO, 1996; WHO, 1998) health component is the most influential factor to define aging women's total quality of life. In this study health component comprises four indicators including body mass index, exercise, smoking, and drinking habit. Study findings indicate that more than half of the respondents (62 percent) are overweight with a Body Mass Index (BMI) in the range of 25 to 30 while only 27.5 percent of respondents are normal weight with BMI in the range of 18 to 25. Furthermore, the majority of women (85.0 percent) are reported to have no regular exercise, while only few of respondents (15.0 percent) are reported to exercise regularly. Furthermore, among study participants, smoking habit (7 percent) is lower than drinking (15 percent) habit.

4. Psychological component

According to literature review, women's psychological well being mostly depends on their health situation, stress and earlier life experiences such as divorcing, widowing so on (Mishra, 2005; Hulka, 1996). In addition, for menopause age women sexual satisfaction is directly correlated with their subjective well being. In this connection, subjective indicators are being considered by current life stress and sexual satisfaction of women. As far as subjective indicators are concerned, seven out of ten of respondent's (70.0 percent) have current life stress. Besides, almost half of the menopause women (47.0 percent) are not satisfied with their sexual life. It is considerable that the majority of women (75.0 percent) are married, but almost 1 out of the 2 respondent is not satisfied with their sexual life.

Scoring of normalization of menopause women's quality of life components

In order to assess overall quality of life appropriately, quality of life component index is used. The following formula is used for the normalization method (Krishna et al, 2006):

[(Actual value – Minimum value)/ (Maximum value-Minimum value)]* 100

The final index is in the range of 0-100 (the worst score is 0 and best is 100). By applying normalization, each component and total quality of life mean score of menopause women can be assessed. According to Table 2, the mean score of total menopause women's quality of life equals 44.34 score. The highest score is for the social support component (72.06 score) followed by the psychological component (47.87 score) and economic component (32.0 score) while the lowest score is for the health component (26.4 score).

Table 2: Mean score women's quality of life components

Quality of life components	Mean	SD	Max	Min	Rank
Total QOL	44.34	16.0	88.88	13.88	
Social support component	72.06	25.10	100.0	33.03	I
Psychological component	47.87	22.49	100.0	0.0	II
Economic component	32.10	46.73	100.0	0.0	III
Health component	26.49	14.96	77.0	0.0	IV

The relationship between socio demographic characteristics, menopause symptoms and women's quality of life

As shown in Table 3, women who are younger (aged below 50 years), currently married and during their premenopausal periods have the better quality of life than those of others. Particularly, women who have no menopausal symptoms tend to have a higher subjective quality of life compared with women who have moderate and severe menopausal symptom. In addition, having a good perception of knowledge on menopause and positive attitudes toward menopause resulted in the higher total quality of life than their counterparts. Moreover, women who have not experienced any menopause symptom and who have a low severity of symptom, tend to have a better subjective quality of life compared to their counterparts. Moreover, those who have low and mild severity symptom have comparably higher social support component than those who have moderate & severe severity of menopausal symptoms. Overall, it can be seen that there is a relationship between menopausal symptoms and women's quality of life among these menopausal women.

Table 3: Women's QOL components mean scores by socio demographic characteristics (N=247)

* p<0.05 ** p< 0.01 *** p< 0.001

Variables	Economic			Social			Health			Psychological			Total QOL		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Age groups															
> 50	120	30.0	46.0	120	69.4	24.6	120	25.4	14.6	120	52.9*	21.5	120	44.4	16.2
50-54	71	29.6	47.0	71	74.6	23.5	71	24.6	14.9	71	46.5	20.8	71	43.6	17.2
≤ 55	56	39.3	49.3	56	74.4	27.7	56	27.4	16.0	56	40.6*	21.6	56	45.2	16.6
Marital status* **															
Married	186	33.9	47.5	186	74.5*	23.5	186	24.9	14.1	186	53.2***	21.6	186	46.5***	16.1
Not married	61	26.2	44.3	61	64.5*	28.5	61	27.7	17.3	61	33.2***	14.2	61	37.6***	16.3
Menopause periods*															
Premenopause*	68	42.6*	49.8	68	72.0	24.2	68	27.4	15.2	68	54.8*	19.9	68	49.2*	16.4
Perimenopause	39	35.9	48.4	39	76.0	22.8	39	26.8	14.4	39	52.6	22.8	39	47.8	16.7
Postmenopause*	140	25.7*	43.9	140	71.0	26.1	140	24.4	15.0	140	43.9*	21.6	140	41.0*	15.4

The relationship between socio- demographic characteristics, menopause variables and women's subjective quality of life components

In this study, subjective quality of life of menopausal women comprised two indicators namely women's current stress situation and sexual satisfaction. As shown Table 4, older, not married, postmenopausal women are more likely to have more stress while younger, married women are less likely to have stress. Similarly, in this study, younger, married and perimenopause women are more likely to have a satisfaction with their current sexual life than older, not currently married and postmenopausal women. This finding is consistent with other similar studies. For instance, Avis (2004) showed that married menopause women and those who had less stress in life have a better quality of life. He suggested that there is a significant relationship between quality of life, marital status, stress and social supports. Furthermore, Steven (1982) found that midlife women who reported increased stress due to sleep problems, home stress, and financial stress also reported stress related to sexual difficulties. Therefore, sexual satisfaction is important factor of life quality of menopause women and also it is interactive with other factors such as marital status, life stress and so on.

Table 4: The relationship between background variables, control variables, and women's Sexual Satisfaction $X^{2\ test}$ (two- tailed)

Variables	**Satisfied with sex**		**Not satisfied with sex**		**Total**	**P**
	N	**%**	**N**	**%**	**(100%)**	
Age groups						**17.94*** **
> 50	79	32.0	41	16.6	120	
50-54	42	17.0	29	11.7	71	
≤ 55	18	7.3	38	15.4	56	
Total	**139**	**56.3**	**108**	**43.7**	**247**	
Marital status						**76.09*** **
Married	134	54.3	52	21.1	186	
Not married	5	2.0	56	22.7	61	
Total	**139**	**56.3**	**108**	**43.7**	**247**	
Menopause periods						**10.95*** **
Perimenopause	73	29.6	34	13.8	107	
Postmenopause	66	26.7	74	30.0	140	
Total	**139**	**56.3**	**108**	**43.7**	**247**	

Table 4: The relationship between background variables, control variables, and women's Sexual Satisfaction $X^{2\ test}$ (two- tailed) *(Continued)*

Variables	Satisfied with sex		Not satisfied with sex		Total	P
	N	%	N	%	(100%)	
Perception of knowledge						**22.93*** **
Poor	13	5.3	37	15.1	50	
Fair	92	37.6	51	20.8	143	
Good& Very Good	32	13.1	20	8.2	52	
Total	**137**	**55.9**	**108**	**44.1**	**245**	
MS severity						**3.98**
Low (0-4 score)	89	36.2	59	24.0	148	
Mild (5-9 score)	32	13.0	24	9.8	56	
Moderate & Severe (10-14 score)	18	7.3	24	9.8	42	
Total	**139**	**56.5**	**107**	**43.5**	**246**	
MS experience						**1.93**
No	39	15.8	22	8.9	6	
Yes	100	40.5	86	34.8	186	
Total	**139**	**56.3**	**108**	**43.7**	**247**	

* p<0.05 ** p< 0.01 *** p< 0.001

Conclusion

The background of this study is the significance of research in health of menopausal women in Mongolia due to a lack of basic information about the situation of Mongolian. This study will be the point of departure in this area to develop appropriate health care service and enhancing well- being of women in different stages of menopause. The objectives of this study are to (1) illustrate the women's quality of life, (2) examine the relationship between menopausal symptoms and quality of life components of women during their menopausal periods by applying descriptive and bivariate analysis. Based on the study results the concluding points are listed as follows:

1. About 75.3 percent of the samples experienced menopausal symptoms. Psychological symptoms were more common among these women namely physical and mental exhaustion (60.3 percent), depressive mood (36.8 percent) followed by joint and muscular pains (45.0 percent).This pattern of menopausal symptoms of these women is similar to other Asian women.

2. Among the quality of life components social support component plays a crucial role compared to other components. Among these menopausal women psychological component score was quite low. Regarding psychological indicators, the majority of them (70.0 percent) have current life stress, and nearly half of them have (44.0 percent) dissatisfaction with their sexual life.
3. Health component score was the lowest among these women. Regarding the health indicators, more than half of the women (62percent) are overweigh

while only 27.5 percent have normal weight. Among those menopausal women they have poor healthy lifestyles. The majority (85.0 percent) of women were having no practice for regular exercise

4. Regarding psychological indicators, there is a relationship between postmenopausal status, menopausal experience, level of severity and women's current stress situation. Moreover, there are relationships between age, marital status, menopausal periods and women's current sexual satisfaction.

Recommendations

This study introduces some possible recommendations to increase a quality of life of women who suffer from different symptoms when they reach the age of menopause.

- Promoting healthy lifestyles for menopausal women is an important challenge to enhance women's quality of life. For instance, the most advisable method that can improve women's life quality is regular exercise, healthy exercise habit.
- There is a necessity to introduce specific health care service for menopausal women such as stress management, psychological consultation and activities to promote social support care for elderly women and effective intervention programs addressed to menopausal aging women's health needs. Finally, it is worth developing country specific standardized quality of life and quality of health service questionnaire among those women who visit hospitals for seeking menopausal care in order to define their future needs and to carry out proper health care and services for them.

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WHO, (1996). Research on the Menopause in the 1990s: *Switzerland, Geneva.*

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Factors affecting infant mortality in Lao PDR

Thipsavanh INTHARACK

Abstract

Infant mortality is a major public health problem, especially for Lao PDR. Infant mortality rate in Lao PDR (67.2 per 1,000 live births, Census 2005) is highest among ASEAN countries, except Cambodia. Thus, the purpose of this study is to identify factors affecting infant mortality in order to make more effective intervention program to reduce infant mortality. These factors include maternal, socio-economic and environmental factors. The study utilizes secondary data from Lao PDR, Multiple Indicator Cluster Survey, 2006. The units of analysis are women aged 15-49 years who gave births one year before the survey. Among 944 mothers included in the analysis, 7.7 percent experienced infant mortality.

Binary logistic regression utilized for assessing the net effects of all independent variables on infant mortality. The results reveal that the relationship between maternal factors (age of mother, antenatal care, assistance at birth), socioeconomic factors (area of residence and household economic status) and infant mortality are statistically significant. Mothers aged 15-19 years have the highest infant mortality. Mothers who had no ANC, did not receive any assistance during delivery, live in rural area, in the poorest households are most likely to have infant mortality. Based on the findings, some policy implications are suggested.

Introduction

The Lao PDR is one of the least developed countries in terms of GDP per capita. About 73 percent of the population live on less than US $2 a day, and 25 percent live on less than US $1 a day (World Bank 2007). More than 70 percent of the populations reside in rural areas. The population structure and economic conditions place a heavy burden on government financial systems, especially for the provision of social services such as health care and education.

According to the 2005 Lao Population and Housing Census, the total population of Lao PDR was approximately 5.6 millions, of which about 49.4 percent were males and 50.6 percent were females. The Census identified 49 different ethnic groups. Lao ethnic group consisted of 55 percent, while 11 percent were Khmu ethnic group and 8 percent were Hmong ethnic group and other ethnicities accounted for 26percent. The growth rate of total population was 2.1 percent. The population was expected to double over the next 25 years. However, the population density was the lowest among countries in the ASEAN countries. Currently, a woman in Lao PDR has 4.8 children on average, which is relatively high compared to the other ASEAN countries.

Infant mortality is a major public health problem, especially for developing countries. Overall infant mortality in the world was about 47 per 1,000 live births, 5 per 1,000 live births in Industrial Countries, 84 per 1,000 live births in less developed Countries. For least developed countries, the infant mortality rate was 17 times as

high as it was for more developed countries (UNICEF, 2007). The infant mortality rate in Lao PDR is highest among ASEAN countries, except Cambodia. However, the trend of infant mortality in Lao PDR has steadily declined over the years. Based on 2007 UNICEF Statistics Report, the infant mortality declined from 155 per 1,000 live births in 1960 to 56 per 1,000 live births in 2007.

Despite the decline in infant mortality, the Lao Government is committed to improve people's health status with a target to further reduce infant mortality to 45 per 1, 000 live births in 2015 (Committee for Planning and Investment (CPI), 2006-2010). The Ministry of Health has established Mother and Child Programs to support these commitments. Apart from the impact of the government programs, there are many other factors that play a role in the reduction of infant mortality including maternal, socioeconomic and environment factors. Maternal factors include age of mother at the time of giving birth; antenatal care, assistance at birth and tetanus toxoid immunization (Committee for Planning and Investment (CPI), 2006-2010). Socio-economic factors consist of place of residence, mother's education, household economic status, mother tongue of head household (Committee for Planning and Investment (CPI), 2006-2010). An environment factor affects infant mortality, such as drinking water and (Committee for Planning and Investment (CPI), 2006-2010).

Objective of the study

To determine the relationship between infant mortality and maternal factors, socio-economic factors and environment factors.

Data and methodology

The data are from the 2006 Lao Multiple Indicator Cluster Survey (MICS 3). It was conducted by Department of Statistics under Ministry of Planning and Investment in close collaboration with Hygiene and Diseases Prevention Department of Ministry of Public Health with assistance from UNICEF. The survey is nationally representative and sample stratified into geographic region, 5,894 households were successfully interviewed with a household response rate of 98.4 percent and 7,703 women (age 15-49) were identified. For this study, the unit of analysis is mothers aged 15-49 years who gave births one year preceding the survey, which constitute of 944 women. The infant mortality experiences of these mothers are used.

Results

The results of the study are discussed in two sections. The first section is describes the background characteristic of mother under study such as maternal characteristics, socio-economic characteristic and environment characteristic. The section also presents the results of analysis; which includes the cross tabulation between the independent variables with the dependent variable. The second section, the binary logistic regression is used to determine the relationship between maternal, socio-economics; environment factors and infant mortality. This technique provides help to predict the probability of child dead or survive. Logistic regression is most appropriate for this analysis as the dependent variable for this study is dichotomous. The independent variable in logistic regression can take any form-that is logistic regression makes no assumption about the distribution of the independent variables.

For the multivariate analysis will use model for examines direct effect of independent variable net.

Background Characteristics

Infant mortality

Among 944 mothers who gave births one year preceding the survey, 73 mothers were reported infant dead. In the other word, 7.7 percent of infant died before reaching one year of age (Table 1).

Table 1: Percent distribution of mothers whether they had infant mortality

Infant	Percent	Number of mothers
(1)	(2)	(3)
Survival	92.3	871
Die	7.7	73
Total	**100.0**	**944**

Percent distribution of women and percent infant death by maternal factors

The mean age of mothers in this study is 26.4, with standard deviation 6.6 (Table 2). About 43.5 percent of women are younger than 25 years old. More than half of the women are in preferable reproductive age of 20-29 years. About 29.1 percent are in very high risk age groups: 14.5 percent are less than 19 years of age and 12.6 percent are 35 years and higher. Regarding infant mortality, it reveals that 11.7 percent of mothers aged 15-19 had infant mortality, which is highest.

Antenatal care (ANC) is very important to detect problems associated with pregnancy and delivery. Table 2 shows that 31.4 percent of pregnant women received ANC from medical doctor or nurse. More than 62 percent of pregnant women didn't receive any antenatal care at all, and 9.7 percent of these mothers got infant dead, which is highest.

Table 2: Percent distribution of mothers and percent infant death by maternal factors

Maternal factor	Percent distribution of mothers	Infant		Total Percent	Number of mothers
		Survival	Die		
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Age of mother					
15-19	14.5	88.3	11.7	100	137
20-24	29.0	93.4	6.6	100	274
25-29	27.3	91.1	8.9	100	258
30-34	16.5	96.2	3.8	100	156
35-49	12.6	91.6	8.4	100	119
Mean age of mother = 26.4 and Standard deviation = 6.6					
Antenatal Care					
Doctor/Nurse	31.4	95.9	4.1	100	296
TBA/health/volunteer	6.1	93.1	6.9	100	58
No ANC	62.5	90.3	9.7	100	590

Table 2: Percent distribution of mothers and percent infant death by maternal factors *(Continued)*

Maternal factor	Percent distribution of mothers	Infant		Total Percent	Number of mothers
		Survival	Die		
(1)	(2)	(3)	(4)	(5)	(6)
Assistance at delivery					
Doctor/Nurse	19.6	96.2	3.8	100	185
TBA/health volunteer	24.5	93.5	6.5	100	231
Relative and friends	51.4	91.3	8.7	100	485
No one help	4.6	79.1	20.9	100	43
Tetanus toxiod immunization					
Received more than 2 doses	15.6	95.2	4.8	100	147
Received less than 2 doses	84.4	91.7	8.3	100	797
Total	**100**	**92.3**	**7.7**	**100**	**944**

Note: TBA = Traditional Birth Attendance

Safe delivery service is very important as it protects the life and health of mother and child by ensuring the safe delivery. Table 2 shows that only 19.6 percent received assistance from medical doctors or nurse, and 24.5 percent received assistance from Traditional Birth Attendance /health volunteer and more than half of woman received assistance from relatives, friends and neighbors. These findings indicate that most of the deliveries took place at home (82.3 percent) and about 4.0 percent of women gave birth by themselves. As expected, mothers who did not receive any help during delivery had the highest infant mortality (20.9 percent).

Tetanus toxiod immunization is given during pregnancy for the prevention of neonatal tetanus. Historically, it is one of principal causes of death among infants in many developing countries (NIPORT, 2004). This study shows that only 15.6 percent of women received tetanus at least two doses and 84.4 percent of women received tetanus immunization less than two doses. The proportion of infant mortality among mothers who did not receive at less two doses of tetanus toxiod injection was 8.3 percent compared to 4.8 percent of those who received tetanus toxiod more than two doses.

Percent distribution of mothers and percent infant death by Socio-economic factors

More than 80 percent of mothers live in rural area (Table 3). However, infant mortality was not much different between urban and rural areas. About 7.9 percent of infant died in rural area while 7 percent of infant died in urban area.

Education of mother has a positive effect on infant mortality (Mosley 1983; Belm, 1979, Caldwell and McDonald, 1981, Kabir and Amin 1993). Table 3 shows that 61.3 percent of women who gave birth one year preceding the survey had some education, while 38.7 percent of women had no education. About 10.4 percent of

mothers with no education had infant death compared to 6.6 percent of those with primary school and 4.8 percent of those with secondary school and over.

According to the household economic status, it is based on household assets and utility services. More than half of households were considered to be poor, 19.2 percent of them were in the middle economic status group and about 23.8 percent of them were relatively rich. The proportion of infant death among mothers living in the richest households was lowest (2.1 percent) compared to about 10.9 percent among the poorest, 8.9 percent is poor, 7.2 percent is middle economic status households.

Concerning the mother tongue of household head, the proportion of Lao mother tongue language constituted almost half of total mothers, while 17.5 percent were Khmu, 14.5 percent were Hmong and 23.2 percent were other language groups. Infant mortality of mothers whose Lao was the mother tongue of household head was lowest (5.4 percent), followed by Hmong (7.3 percent). It was highest among mothers who stayed in households where household heads spoke Khmu or other languages (about 10 percent).

Table 3: Percent distribution of mothers and percent infant death by socio-economic factors

Socio-economic factors	Percent distribution of mothers	Infant		Total Percent	Number of women
		Survival	Die		
(1)	(2)	(3)	(4)	(5)	(6)
Place of residence					
Rural	84.9	92.1	7.9	100	801
Urban	15.1	93	7	100	143
Mother education					
Secondary school+	17.7	95.2	4.8	100	167
Primary school	43.6	93.4	6.6	100	412
No education	38.7	89.6	10.4	100	365
Household economic status					
Poorest	32.2	89.1	10.9	100	304
Poor	24.9	91.1	8.9	100	235
Middle	19.2	92.8	7.2	100	181
Rich	13.5	96.9	3.1	100	127
Richest	10.3	97.9	2.1	100	97
Mother tongue of head					
Lao	44.8	94.6	5.4	100	423
Khmu	17.5	89.1	10.9	100	165
Hmong	14.5	92.7	7.3	100	137
Other Languages*	23.2	90	10	100	219
Total	**100**	**92.3**	**7.7**	**100**	**944**

*Note: * other languages such as: Laven, Lavee, Katang, Makong, Muser, Pong, Samtao, Lahu and Mieng*

Percent distribution of women and percent infant death by environment factors.

Environmental factors in this study are drinking water and sanitation. There is not much different in types of water: about half of households used either improved or not improved drinking water. For sanitation, there is a big difference between households: about 28.1 percent of women had improved sanitation while 64.5 percent had no facility. Table 4 shows that 6.4 percent of mothers living in households using improved drinking water had infant mortality while 9.2 percent of those living in households using unimproved drinking water had infant mortality. While infant mortality was about 9.0 percent for those living in households with no facility.

Table 4: Percent distribution of women and percent infant death by environmental factors

Environmental factors	Percent distribution of mothers	Infant		Total Percent	Number of women
		Survival	Die		
(1)	(2)	(3)	(4)	(5)	(6)
Drinking water					
0 Improved water	51.4	93.6	6.4	100	485
1 Not improved water	48.6	90.8	9.2	100	459
Sanitation					
1 Improved sanitary	28.1	95.5	4.5	100	265
2 Unimproved sanitary	7.4	91.4	8.6	100	70
3 No facilities	64.5	91	9	100	609
Total	**100**	**92.3**	**7.7**	**100**	**944**

Binary logistic regression analysis, discussions and policy implications

In order to examine the net effects of all independent variables on the dependent variable (infant mortality), the logistic regression is used. Infant mortality is coded: 1=infant died and 0=infant not die. All independent variables are treated as dummy variables. Three models are used for the analysis. Model 1 includes only maternal factors. Model 2 adds Model 1 with socio-economic factors. The last model includes Model 2 and environmental factors. The reference category has an odds ratio of 1 corresponding to regression coefficient of zero. The odds ratio indicates the probability of infant mortality among women in the different categories within each variable in comparison to the reference category.

Table 5 presents the three models of binary logistic regression. The difference in probability of infant mortality is indicated by odds ratio and maternal factors, socio-economic factors and environment factor have been found to be statistically significant.

Table 5: Binary logistic regression models

Independent variables	Odds ratios		
	Model 1	Model 2	Model 3
Maternal factor			
Age of mother			
15-19[R]			
20-24	0.54 *	0.51 *	0.50 *
25-29	0.75	0.68	0.71
30-34	0.27 ***	0.24 ***	0.24 **
35-49	0.59	0.50	0.52
Antenatal Care			
Doctor/Nurse [R]			
TBA/health volunteer	1.34	1.61	1.66
No ANC	1.98 *	1.95 *	1.98 *
Assistance at delivery			
Doctor/Nurse/midwife [R]			
TBA/health volunteer	1.32	1.01	1.00
Relative/friends	1.61	1.03	1.01
No one help	4.97 ***	3.02 *	2.95 *
Tetanus toxoid immunization			
Received more than 2 doses [R]			
Received less than 2 doses	1.70	1.72	1.69
Socio-economic factor			
Place of residence			
Urban [R]			
Rural		2.46 **	2.49 **
Mother education			
Secondary school+ [R]			
Primary school		0.79	0.77
No education		1.08	1.03
Household economic status			
Richest [R]			
Poorest		7.07 **	6.14 *
Poor		5.93 *	5.24 *
Middle		4.69 *	4.16
Rich		1.98	1.87
Mother tongue of head			
Lao [R]			
Khmu		1.17	1.22
Hmong		0.54	0.55
Other Languages		1.04	1.07

Table 5: Binary logistic regression models *(Continued)*

Independent variables	Odds ratios		
	Model 1	**Model 2**	**Model 3**
Maternal factor			
Improved drinking water			
Improved water [R]			
Not improved water			1.30
Sanitation			
Improved sanitary [R]			
Unimproved sanitary			1.25
No facilities			1.10
-2 log likelihood	**485.79**	**471.31**	**469.99**
Degree of freedom (df)	**10**	**20**	**23**

*Note: ***P<0.01 **P<0.05 *P<0.1.*
R = Indicates the reference category of each independent variable

In Model 1, for maternal factors, the relationship between ages of mother, antenatal care and assistance at birth and infant mortality are statistically significant. The exception is for tetanus toxoid immunization. Age of mother at the time of birth has a significant negative relationship with infant mortality. Mothers aged 15-19 years have the highest infant mortality. The odds ratio of mothers aged 30-34 years is 0.27; these mothers are 73 percent less likely to have an infant mortality than those women aged 15-19 years old. This finding, perhaps are due to the fact that teenage mothers don't have much experiences how to take care of their children. In addition, their biological factors are not ready to have babies or they are too young to pregnancy. Therefore, these young mothers lack knowledge concerning childbearing. It is similarly to the finding in India concerning infant and child mortality (Panda, 2005).

Concerning antenatal care (ANC), mothers who had no ANC are most likely to have infant mortality compared to those who received ANC. Those who received ANC from doctors or nurses have the lowest risk of infant mortality. This finding is similar to a study in Uttar Pradesh, India concerning impact of maternal education and health services on child mortality (Rajna, Mishra and Krishamoorthy, 1998).

Regarding assistance during delivery, mothers who did not receive any assistance have a significant positive effect on the chance of infant mortality. It is nearly 3 times more likely to have infant mortality compared to the reference category (receiving assistance from doctors or nurses). This is a similar result found in a study in Bangladesh concerning mother's health seeking behavior and infant and child mortality (Howlader, A.A. and Bhuiyan, M. 1999).

In Model 2, after socioeconomic factors added to Model 1, the results of maternal factors do not change much. Concerning socioeconomic factors, it reveals that only the relationship between place of residence, household economic status and infant mortality are statistically significant. Mother's education and mother tongue of household head are not statistically significant. Regarding place of residence, the infant born from mothers in rural area is 2.5 times more likely to die than mothers in urban area. Urban area, perhaps, has a good living condition, high economic status, easily access to health facilities especially maternal and child program. This is a similarly situation in Bangladesh (Kabir and Ahamed, 1996).

Economic status of households is an important factor affecting the health of mothers and children. The probability of dying among infants born from mothers in the poorest economic status is highest, which is 7.1 times more likely to die compared to the richest households. Infants in poor and middle economic status households are 5.9 times and 4.7 times respectively more likely to die compared to those in the richest households. Poverty is a main problem affecting infant mortality because households with poor economic conditions lack money, knowledge about health care, education and have low living standard.

The third model has used the second model controlling for environment factors. The findings show that the maternal and socioeconomic factors do not change much. Additionally, the environmental factors do not show any statistically effect on infant mortality. However, the direction of relationship is as expected. Table 5 shows that women lived with un-improved drinking water are 1.3 times more likely to experience infant mortality than those with improved drinking water. Regarding sanitation, mothers live in households with un-improved sanitation and no facility are 1.3 and 1.1 times respectively more likely to have infant death compared with those live in households with improved sanitation.

According to the research findings, some policy implications are suggested as follows:

- The policy should encourage women not to have first birth when they are too young by providing information, education and communication (IEC) about the risk of having children when they are too young, family planning methods and services.
- The policy should encourage mothers to go to hospital or health center nearest home, especially in rural area, for antenatal care and delivery. Capacity building for local health staff both quality and quantity of health system should be increased and strengthen.
- There is a need for more support and active implementation of reproductive health programmes including not only the provision of health services but also health care promotion with adequate information and educational programmes. Activities to motivate them on health care such as “the 3 cleans of preventative health care: drinking boiled water, eating cooked food and living cleaned should be generated.
- Poverty reduction will take a long term. However, the disparities between rural and urban area should be reduced. The transport and communications networks and living condition of rural people should be improved.
- Bottom up approach should be used at the micro level. Intervention programs to reduce infant mortality should be designed based on the participation of local people.

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Factors Affecting Antenatal Care Utilization in Afghanistan

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Abstract

This study focuses on antenatal care (ANC) utilization in Afghanistan. Secondary data from the 2006 Afghanistan Health Survey were used, which included 2,660 women (14-49 years) who had delivered during two years before the survey. The results of study depict that women's age, parity, residency, perception of health services, travel time/distance, mode of transportation, access to mass media, and husband's education are affect ANC utilization.

Thus, this study suggests that in order to increase ANC utilization, a strategy needs to be developed so to increase the accessibility of women to maternal health services, IEC programs should be provided in the community and health facilities, and maternal health messages should be disseminated through the mass media. Furthermore, early pregnancy and high parity should be discouraged.

Introduction

The care that a pregnant woman receives from a health professional is an indicator of maternal health (El-Gilany & Arif, 2000). The benefits of ANC are timely diagnosis and treatment of obstetric problems. The medical personnel advise women about ANC, safe delivery, breastfeeding, early postnatal complications, and family planning (Lincetto, et al., 2006). ANC guidelines divide pregnant women into two groups: women with normal pregnancy (about 75% of pregnancies) who should have at least four ANC visits with skilled medical personnel; and women with risk factors (about 25% of pregnancies) who need to receive special care during the whole period of pregnancy (W.H.O, 2002).

Worldwide 70% pregnant women visit skilled medical personnel, this is higher in industrialized countries (98%) than in developing (75%) countries (WHO & UNICEF, 2003). In Latin America/Caribbean, Central and Eastern Europe, the Commonwealth of Independent States (CEE/CIS), and East Asia/Pacific 94%, 90%, and 89% women received ANC respectively. The proportion in the Middle East/North Africa, sub-Saharan Africa, and South Asia was only 72%, 69%, and 65% respectively. Afghanistan has the lowest percentage of women making at least one ANC visit (UNICEF, 2008) with only 32% of pregnant women visiting a skilled-medical personnel once (MoPH, 2006). Worldwide 50% of pregnant women had at least four ANC visits, but the proportion in South Asian, West/Central African, sub-Saharan African, and Eastern/Southern African countries was 46%, 44%, 42% and 40% respectively (UNICEF, 2008).

Everyday, 1,500 women die worldwide from pregnancy related causes, because of women's limited access to health care. In 2005, 536,000 women died due

to the above causes, 99% of these deaths occurred in developing countries. Many of these deaths could have been prevented, if the women had access to proper health care. Maternal mortality rates (MMR) were higher (450/100,000 live births) in developing countries than developed countries (9/100,000 live births in). Fourteen countries have MMRs more than 1,000/100,000 live births. All but one of them is located in sub-Saharan Africa; the exception is Afghanistan. The average ratio for all Asian countries is 300/100,000 live births, while in Afghanistan it is 1,600/100,000 live births (WHO, UNICEF, UNFPA, & World Bank, 2007).

In Afghanistan most people are rural residents, only 22% people live in cities. Access to health services is limited, because of insecurity, limited health facilities and the lack of transport (WHO, 2007). Afghanistan is the worst location for pregnant women in the world (ICHR & Ibn Sina, 2002). According (UNFPA, 2006) every 27 minutes one woman dies due to pregnancy related causes. Every year 25,000 women die in Afghanistan due to pregnancy related causes (WHO, 2007) creating huge problems for the affected families and in particular the impact is most strongly felt by the children. After the death of a mother the infant remains without been breast feed, the chances of dying for such infants are very high due to malnutrition.

Timely ANC visits are critical for safe motherhood, if delayed it not only increases the chances of maternal morbidity and mortality, but it also associated with fetal morbidity and mortality (Magadi, et al., 1999). Therefore, the specific objective of the study is to explore the factors, which are affecting ANC utilization. The ultimate objective is to provide policy makers with appropriate information regarding the factors that are affecting ANC utilization and to develop a health service strategy for maternal health services, which may increase ANC utilization.

Research methodology

This study utilized secondary data from the 2006 Afghanistan Health Survey, which was designed for the assessment of maternal and child health and conducted by Ministry of Public Health of Afghanistan and technically supported by the Johns Hopkins University and the Indian Institute of Health Management Research. This survey covered 29 of the country's 34 provinces; five provinces and some districts of other provinces were not included due to insecurity. Likewise, the six major cities of Kabul, Kandahar, Herat, Kunduz, Jalalabad, and Mazar were also excluded, because the major aim of MoPH was to find out the priority of health indicators of rural areas. Since, each province has districts, and each district in turn is divided into enumeration units, like villages and sub-villages in rural areas and blocks in urban areas. The sampling frame contains more than 45,000 clusters in rural and urban areas. This survey covered 425 clusters, 397 were completed but the others were not due to insecurity. The sampling frame included 8,320 households of which 8,278 were ccontacted. In total there were 8,659 eligible women of whom 8,281 were interviewed. For this study questions relating to ANC utilization were analyzed, while the sample was 2,660 women who had delivered in the last two years before survey.

Results

General characteristics of the women and frequency of ANC visits are shown in Table 1. Of the 2,660 women in the study only one third (32.7%) received ANC, while two thirds (67.3%) never received ANC from any skilled medical personnel during their last pregnancy. Regarding age, most of the women (69.3%) are aged 20-34 years (middle group), while 18.9% and 11.8% are in the elder and younger age groups respectively. Comparing the three age groups the younger women received more ANC than women in the middle and elder groups; the proportion receiving ANC was 44.4% for the youngest group, 31.5% for the middle group and 29.7% for the oldest group.. In terms of parity, the women who had delivered more than four times are a little less (47.1%) likely to receive ANC than women who had delivered less than four times (52.9%).

In the study, the majority of the women (87.7%) were rural residents, while the rest were living in the urban areas. Urban women (56.3%) were almost two times more likely to receive ANC than rural women (29.4%). For ANC utilization 60.9% of the women traveled more than one hour from home to the health facility. Of the women who traveled less than one hour more 40% received ANC as compared to 28% of their counterparts. Furthermore, the majority of the women (79.1%) traveled by non-mechanized transportation (foot, donkey, or horse) to the health facility, while only 20.9% used mechanized transport (motorbike, car, or bus). Of the women who traveled by non-mechanized mean less 31.5% received ANC as compared to 37.1% of those women who traveled by mechanized transport.

Table 1: Percentage distribution of women by ANC utilization and independent variables

Variables	Total		ANC Received				
			Yes		No		*Total*
	Percent	Number	*Percent*	Number	*Percent*	Number	*Percent*
Antenatal Care			*32.7*	870	*67.3*	1,790	*100.0*
Woman's age							
14-19	11.8	315	*44.4*	140	*55.6*	175	*100.0*
20-34	69.3	1,843	*31.5*	581	*68.5*	1,262	*100.0*
35-49	18.9	502	*29.7*	149	*70.3*	353	*100.0*
Parity							
Less than four	52.9	1,404	*32.0*	450	*68.0*	958	*100.0*
More than four	47.1	1,252	*33.5*	420	*66.5*	832	*100.0*
Residency							
Rural	78.7	2,333	*29.4*	686	*70.6*	1,647	*100.0*
Urban	12.3	327	*56.3*	184	*43.7*	143	*100.0*
Travel time							
Less than one hour	39.1	1,039	*40.0*	416	*60.0*	623	*100.0*
More than one hour	60.9	1,621	*28.0*	454	*72.0*	1,267	*100.0*

Table 1: Percentage distribution of women by ANC utilization and independent variables *(Continued)*

Variables	Total		ANC Received				
			Yes		No		*Total*
	Percent	Number	*Percent*	Number	*Percent*	Number	*Percent*
Transportation							
Non-mechanized	79.1	2,105	*31.5*	664	*68.5*	1,441	*100.0*
Mechanized	20.9	555	*37.1*	206	*62.9*	349	*100.0*
Family economic status							
1st quintile	20.5	544	*25.6*	139	*74.4*	405	*100.0*
2nd quintile	20.6	548	*31.0*	170	*69.0*	378	*100.0*
3rd quintile	21.1	561	*33.2*	186	*66.8*	375	*100.0*
4th quintile	19.5	519	*33.9*	176	*66.1*	343	*100.0*
5th quintile	18.3	488	*40.8*	199	*59.2*	289	*100.0*
Woman's education							
Literate	5.6	149	*52.3*	78	*47.7*	71	*100.0*
Illiterate	94.4	2,511	*31.5*	792	*68.5*	1,719	*100.0*
Perception of health care	29.9	796	*43.7*	348	*56.3*	448	*100.0*
Yes							
No	70.1	1,864	*28.0*	522	*72.0*	1,342	*100.0*
Husband's education							
Literate	34.4	913	*41.4*	378	*58.6*	535	*100.0*
Illiterate	65.7	1,747	*28.2*	492	*71.8*	1,255	*100.0*
Listen to the radio							
Yes	46.2	1,228	*37.5*	460	*62.5*	768	*100.0*
No	53.8	1,432	*28.6*	410	*71.6*	1,022	*100.0*
Watching TV							
Yes	18.6	496	*47.4*	235	*52.6*	261	*100.0*
No	81.4	2,164	*29.3*	635	*70.7*	1,529	*100.0*
Total of each variable	100.0	2,660					

The proportion of the women who received ANC from the poorest to the richest families are 25.6%, 31%, 33.2%, 33.9%, and 40.8% respectively. Almost all (94.4%) women are illiterate, while only 5.6% attended school. More literate women (52.3%) received ANC than illiterate women (31.5%). More than two thirds (70.1%) of the women were unaware about the existence of health facility/community health workers (CHW) in their community, while less than one third (29.9%) of them knew that there is a health facility in their community or a CHW is working there. The women (43.7%) who were aware of health services received more ANC than those who were unaware (28%). In terms of husband's education one third (34.3%) are literate while two thirds (65.7%) of them are illiterate. The wives (41.4%) of the literate received 1.5 times more ANC than the wives of the illiterate (28.2%).

Radio and TV are the most informative sources of media in Afghanistan;, 46.2% and 18.6% of the women were listening to the radio and watching TV at least once a week respectively. Women (37.5%) who listened to the radio received more ANC than women who did not listen to the radio (28.6%). Similarly the women (47.4%) who watched TV received more ANC as compared to their counterparts (29.3%).

For examining the effect of independent variable on the ANC utilization, binary logistic regression was used. The significant level and odd ratios are shown in Table 2.

Woman's age had a negative effect on the chance of receiving ANC. The women who are in the middle and elder group are 43% and 52% respectively less likely to use ANC than the women in the younger group (P<0.001). However, parity had a positive association with ANC utilization; women who had delivered more than four times are 1.35 times more likely to receive ANC than women who had delivered less than four times (p<0.01). The residency of the women also had an effect on ANC utilization. Compared to rural women, urban women are 2.33 times more likely to utilize ANC services (p <0.001). Travel time had a negative effect on the chance of receiving ANC. As compared to the women who are living within one hour distance between home and a health facility, the women who are living more than one hour distance, are 22% less likely to utilize ANC services (p<0.01). Regarding type of transport, women who used mechanized transport were 1.23 times more likely to receive ANC compared to women who traveled to the health facilities by non-mechanized means (p<0.05). In the study family economic status and women's education were not influential factors and did not have any significant effect on the ANC utilization. However, women's awareness of health services was a significant factor; women aware of health serces were two times more likely to use ANC services compared to the women who are unaware of health services (p<0.001). Husband's education was an influential factor affecting ANC utilization. Women who had literate husbands were 1.49 times more likely to use ANC services compared to the women who had illiterate husbands (p<0.001). Further, women who watched TV are 1.49 times more likely to use ANC services compared to those who did not so (p< 0.01). Whereas, it is interesting to observe that listening to the radio had no significant effect on the ANC utilization.

Table 2: Binary logistic regression: Factors affecting ANC utilization

Variables		ANC Utilization		
		B	**S.E**	**Odds ratio**
Woman's age	14-19 years ®			
	20-34 years	-.563	.137	.570 ***
	35-49 years	-.731	.182	.481 ***

Table 2: Binary logistic regression: Factors affecting ANC utilization *(Continued)*

Variables		ANC Utilization		
		B	**S.E**	**Odds ratio**
Parity	Less than four ®			
	More than four	.300	.101	1.350 **
Residency	Rural ®			
	Urban	.848	.132	2.334 ***
Travel time	Less one than hour®			
	More one than hour	-.254	.092	.775 **
Transportation	Non-mechanized®			
	Mechanized	.212	.106	1.237*
Family economic status	Poorest ®			
	Poor	.167	.140	1.182
	Middle	.166	.140	1.180
	Rich	.079	.147	1.082
	Richest	.173	.154	1.189
Woman's education	Illiterate®	.260	.188	1.297
	Literate			
Perception of health care	No®			
	Yes	.706	.092	2.027 ***
Husband's education	Illiterate®			
	Literate	.399	.095	1.490 ***
Listen to radio	No®			
	Yes	.108	.097	1.114
Watching TV	No®			
	Yes	.372	.119	1.450 **
	Pseudo R-Square	0.90		
	-2 Log Likelihood	3113.017		

®=Reference category, *** p<.001, ** p<.01, * p<.05

Discussion

ANC is widely recognized as an important factor for safe motherhood. Only through ANC can complications during pregnancy be recognized and treated. The result of this study shows that two thirds of the women in Afghanistan had never received ANC during their pregnancy.

The result depicts that younger women have more chance of receiving ANC than women. Younger women are likely to be more anxious about their health and being pregnant would be a new experience for them. Further, be pregnancy at a young age increases risks of complications during pregnancy (Rataikainan, et al., 2007). Younger pregnant women attended health facilities more than older women. This finding is not consistent with previous studies that reported younger women seek later ANC as compared to their elder peers (Trinh & Rubin, 2006; Kapuri, 2005). While

another study reported that women in the middle age are more likely to receive ANC than adolescents and their elder peers (Eijk, et al., 2006).

This study depicts a positive association between deliveries and ANC utilization. The women who had more than four deliveries are more likely to receive ANC than women who give less than four times. The plausible cause could be that when women give more pregnancies with fewer gaps among them, they become weak and feel uncomfortable. Also, high fertility is positively associated with maternal mortality, because each pregnancy increases a woman's lifetime risk of dying due to pregnancy related causes (Greene, M, E., 2008). The results matches with the finding of a study in Bangladesh, the women who delivered five or more times, attended health services more frequently than those who had delivered one or two times (Rahman, et al., 2008). However, there are other studies indicating that women who have more deliveries receive less ANC (Chandhiok, et al., 2006; Reig, & Valverde, 2006; WHO & UNICEF 2003; Qayed, 1998).

In this study travel time had a negative association with ANC utilization. Women who travel more than one hour have less chance to receive ANC than women who travel less than one hour; women's decision about ANC utilization is influenced by travel time and cost of travel. Health services that are situated far away are expensive to use, even if there is no charge, because of travel costs. This is one of the biggest problems for those women who are living in the mountainous areas of Afghanistan. This result matches findings of other studies, in Saudi Arabia women living far away from health facilities attended less often (El-Gilany & Arif, 2000). Increase in the distance/time to the health facility was also an obstacle in Kenya and associated with lesser ANC utilization (Magadi, et al., 1999).

The finding indicates that women who travel by non-mechanized mean are less likely to receive ANC as compared to those who travel by mechanized mean. Use of mechanized transport reduces travel time and women can reach easily to health centers. Travel by non-mechanized means influences the decision of women to seek health care, because it takes more time, and is not comfortable for pregnant women. Furthermore, the result depicts that urban women are more likely to receive ANC than rural women, matching finding of other studies (WHO & UNICEF, 2003). In Egypt women living in urban areas registered more for ANC services as compared to rural women (Qayed, 1998). The plausible reason could be that urban women's access to health centers is easier and they are more exposed to the mass media.

The study's results reveale that family economic status did not have a significant effect on the ANC utilization; this is most likely due to the fact the government provides free public health services. This finding corroborates with the finding of a study in Islamabad, Pakistan, which found that family economic status was not associated with ANC utilization (Alam, et al., 2004). Though, the result is not in line with another study, which reported that the household economic status had an important impact on the utilization of ANC in all regions of the world (WHO & UNICEF, 2003).

One unexpected finding of this study is that women's education does not have a significant effect on ANC utilization. A plausible cause could be that Afghan

society is conservative, and limits the women's decisions in the family even when they are educated. Women are left in the care of others such as their husbands and in-laws or family members, who may not let them make decisions for themselves. Also the social and cultural restrictions limit the women's ability to go out of their homes and into the public for treatment. Previous studies exploring women's education affects on ANC utilization found that mainly women who did not receive ANC were uneducated (WHO & UNICEF, 2003; Erlindawati et al., 2008).

The study's results show that women's awareness of health services affects ANC utilization; women who are aware of health care are more likely to receive ANC than their counterparts.. This matches other previous studies such as by Erlindawati, et al. (2008), Chandhiok, et al, (2006), Murthy, et al. (2007) and Guo-qing, et al. (2004).

The analysis shows that the wives of literate husbands have 1.49 times more chance to receive ANC than the wives of illiterate men, indicating the impact of husband's education on awareness, health status, and health care utilization. Education changes the husbands' attitudes towards their wives. Also, they better know the value of health, how much health care is necessary for their wives' health especially during pregnancy. Educated husbands encourage their wives to seek health care timely (Effendi, et al., 2008). In Bangladesh the wives of men who attained five or more years of education, were two times more likely to be assisted by a health professional during pregnancy than wives of illiterate men (Rahman et al., 2007).

The result revealed that listening to the radio does not affect ANC utilization. This may be due to limited or ineffective dissemination of health messages through radio channels. There may also be a co-linearity between radio ownership and rural residency. As the results revealed by a study in Pakistan, most rural women listen to the radio while most urban women watch TV. Watching TV has influence on the utilization of ANC services, because it enables women to get more information about health services (Paiman, 2005).

It can be concluded that residency, awareness of health services, distance/travel time between home and health facility, mode of transportation, access to the mass media, and husband's education play the most dominant role on whether women will use ANC services or not.

Based on the findings of this study the author suggests:

1. A strategy should be developed to discourage early pregnancy and high parity:
    - Efforts should be made to motivate people to change their attitudes so to have a small and healthy family.
    - Extensive maternal health and family planning messages should be provided in the community and health facilities, and disseminated through mass media around the whole country.
2. Ways of overcoming women's accessibility to the health services should be considered. At the community level the health services should be provided by CHWs and skilled birth attendants. In addition tradition birth attendants should

be trained to help during pregnancy and delivery, identify danger signs of pregnancy and refer them to health centers.

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