Risk Behaviors and Life Skills towards Sexually Transmitted and Blood-Borne Infections among Thai Married Couples

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Objective: *A cross-sectional study of 706 couples or 1,412 individuals with age 15-44 years was carried out to assess risk behaviors, life skill level, and its relationship, and to investigate HBV seromarkers, anti-HCV, and anti-HIV among individuals who voluntarily participated in blood screening.*
Material and Method: *All studied participants who voluntarily participated and signed consents were interviewed about risk behaviors and life skills. Only 166 individuals voluntarily participated in blood screening for HBV seromarkers, anti-HCV, and anti-HIV.*
Results: *The results revealed that, of 1,412 individuals, 15.30% had a history of regular alcohol consumption, 11.26% had tattoos, 5.10% had a history of extramarital sex without using condoms, and 2.83% had a history of sex services. Males had significantly higher risk behavior scores than females, $p < 0.0001$. For life skills, 78.71% of the participants had the middle level of life skill scores. Males had relatively lower life skill scores than females, but it was not significant. The relationship between the levels of risk behavior scores and life skill scores showed significant association, $p < 0.0001$. Results from blood screening showed 31.33% of HBV seromarker positive, 6.63% of HBsAg positive, 1.21% of anti-HCV positive, and 1.21% of anti-HIV positive.*
Conclusion: *The present study showed the significant association between the levels of life skill scores and the levels of risk behavior scores. The participants who had higher level of life skill scores had lower level of risk behavior scores.*

Keywords: *Sexually transmitted and blood-borne infections, Risk behaviors, Life skills*

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Sexually transmitted and blood-borne infections include many distinct clinical syndromes, such as acquired immunodeficiency syndrome, acute pelvic inflammatory diseases, urithritis, hepatitis and others[1]. However, the major sexually transmitted and blood-borne infections including human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) infections are important public health problems in many countries including in Thailand[2-7]. HIV infection attacked more than 40 million people worldwide in the year 2002. Whereas, the prevalence of HCV infection and HBsAg carriers seems more than 5 times and 10 times, respectively as many as HIV infection[3-5,8,9]. The morbidity and mortality associated with HIV infection is largely a consequence of T helper dysfunction. Infected patients with a progressive immunosuppression are characterized by the absence of delayed-type hypersensitivity to common recall antigens[10]. The complications from HCV and HBV carriers are quite serious, i.e. 10-40% will develop chronic hepatitis and gradual progression to liver cirrhosis and hepatocellular carcinoma (HCC)[2,3]. Previous studies have shown that if the HCV patients are also infected with HBV or HIV, they will develop HCC and liver cirrhosis in a shorter time than those who are infected with HCV alone. In addition, HCV infection may contribute to

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faster progression of HIV infection[11,12]. The incidence of HCC and cirrhosis was nearly 6.5 to 11 times higher among HCV-co-infected patients than among those without HCV co-infection[13]. The HIV and HBV transmission include parenteral route and sexual contact, whereas, the major route of HCV transmission is via parenteral route and the minority is via sexual contact[2,3,6,14]. In Thailand, the highest risk groups of HBV, HCV and HIV infections were injecting drug users (IDUs) and female sex workers (FSWs)[15-19]. The couples of these IDUs and the clients of FSWs have increased chances of acquiring HIV and/or HBV and/or HCV infections if they do not use condoms every time they have sexual relations. Both infected these groups can transmit the infections to the general population. Previous studies supported the role of sexual transmission of HIV and HBV among married couples[20-22]. The infections may affect their neonates and siblings from intra-familial transmission[23-25]. Therefore, a married couple is one of the target groups for reducing the risk of these infections. The present study attempted to investigate risk behaviors, life skills, and their relationship in Thai married couples and to determine the prevalence of HBV seromarkers, anti-HCV, and anti-HIV among studied participants who voluntarily participated in blood screening. It is valuable for epidemiological surveillance and for improving the life skill program recommended by the World Health Organization[26] to reduce these infections among this group.

Material and Method

Study design and study participants

The present study was a cross-sectional study conducted among 706 married couples (1,412 participants) aged 15-44 years. All participants voluntarily participated from October 2002 to May 2004. Approximately 100 married couples were selected from seven provinces represented in several regions in Thailand including Chiang Mai, Khon Kaen, Chonburi, Nakhonnayok, Khanchanaburi, Songkhla, and Bangkok by a using multi-stage sampling. The first step was province selection by using a simple random technique, except Bangkok using by purposive sampling. The second was district selection by using stratified sampling, each selected province included Muang District and an outer Muang District. After that, two sub-districts in each selected district were randomly selected (two sub-districts from the Muang District and two sub-districts from an outer Muang District in each selected province). Finally, approximately 25 married couples were selected from each sub-district by voluntary participation (approximately 25 x 4 married couples from each selected province). All studied participants were interviewed by using structured questionnaires. Information about socio-demographic characteristics, risk behaviors towards sexually transmitted and blood-borne infections, especially HIV, HBV and HCV infections and life skills was included. However, only 166 participants (82 couples and 2 individuals) voluntarily participated in blood screening. Before interviews and blood screening, the participants had received the study information, after that, the participants were required to fill in the informed consent forms. The response rate for blood testing was 11.76% because most participants would not like to know their HIV status that might affect their families.

Methods for blood screening

Blood specimens were screened for anti-HIV, HBV seromarkers, and anti-HCV by using the immunochromatography and immunocomb ELISA kits with 96-100% of sensitivity and specificity when compared with the methods of ELISA and RIA[27]. In case of HBsAg, anti-HIV and anti-HCV, a specimen is considered positive if the immunochromatography and immunocomb ELISA are positive together.

Scoring the risk behaviors and life skills

Scoring for answering 1 item of risk behavior was 1 and 0 for answering no risk behavior. Totally, 10 items of risk behaviors were included and the range of score was 0 to 10. The life skills in the present study followed by WHO (1994)[28] included self awareness (4 items), empathy (4 items), critical thinking (4 items), communication and interpersonal relationship (4 items), decision making (4 items) and problem solving (4 items). The scoring for life skills was 1 score for the use of an appropriate life skill and 0 for the use of an inappropriate life skill. The range of score was 0 to 24. When the authors classified the level of life skill, the mean ($\overline{X}$) and standard deviation (SD) of the score for dividing was used. The low level was the score equal to or less than $\overline{X}$ – SD, the middle level was the score more than $\overline{X}$ – SD to $\overline{X}$ + SD and the high level was the score more than $\overline{X}$ + SD

Data analysis

Data from interviews and blood screening were analyzed and presented by descriptive statistics including percentage, mean and standard deviation as well as number and percent. Testing the relationship

between risk behavior score level and life skill score level used the Chi-square test or Fisher exact test where appropriated. The significant difference of mean scores of risk behaviors or life skills between males and females was tested by using unpaired t-test. The critical level of $\alpha = 0.05$ was considered to indicate statistical significance.

Results

Socio-demographic characteristics in the studied participants

Of 1,412 participants (706 couples), 62.82% were 21-30 years of age. The mean ± standard deviation of age was 25.24 ± 7.62 years, ranging from 15 to 44 years. Approximately 38% had completed secondary education and 41.01% had completed vocational level and undergraduate study. About 23% had private businesses and 19.76% were laborers. Almost 76% had low family income (< 10,000 baht/month). The lowest income was 300 baht/month and the highest income was 73,000 baht/month. Details are presented in Table 1.

Risk behaviors toward sexually transmitted and blood-borne infections and life skills

Among the studied participants, 15.30% had a history of regular alcohol consumption, 11.26% had tattoos, 5.10% had a history of extramarital sex without using condoms, 2.83% had a history of sex services, and 1% had a history of anal sex activity. Men had relatively higher percentage of risk behaviors and significantly higher risk behavior scores than females, $p < 0.0001$. Details are shown in Table 2. For life skills,

Table 1. Socio-demographic characteristics of participants (n = 1,412)

Socio-demographic Characteristics	Number	Percentage
Age (years)		
≤ 20	193	13.67
21-30	887	62.82
≥ 31	332	23.51
Gender		
Male	706	50.00
Female	706	50.00
Education		
Primary level	298	21.10
Secondary level	535	37.89
Vocational and undergraduate	579	41.01
Occupation		
Governmental officer	196	13.88
Private business	331	23.44
Laborer	279	19.76
Unemployed	328	23.23
Housewives and others	278	19.69
Family income (Baht per month)		
≤ 5,000	286	20.26
5,001-10,000	784	55.52
≥ 10,001	342	24.22

Table 2. Risk behaviors towards sexually transmitted and blood-borne infections by sex (n = 1,412)

Risk Behaviors	Male (n = 706)		Female (n = 706)		Total (n = 1412)	
	No.	%	No.	%	No.	%
1. History of receiving blood and/or hemodialysis	47	6.66	55	7.79	102	7.22
2. History of contact of blood or blood products	55	7.79	46	6.52	101	7.15
3. History of tattooing	105	14.87	54	7.65	159	11.26
4. History of injecting drug use	16	2.27	2	0.28	18	1.27
5. History of jaundice	56	7.93	37	5.24	93	6.59
6. History of STDs in a previous year	8	1.13	7	0.99	15	1.06
7. History of regular alcohol consumption*	168	23.80	48	6.80	216	15.30
8. History of extramarital sex relation without using condom	57	8.07	15	2.12	72	5.10
9. History of sex service	34	4.82	6	0.85	40	2.83
10. History of anal sex activities	10	1.42	4	0.57	14	1.00
Risk behavior scores : $\overline{X} \pm SD$	0.77 ± 1.15		0.37 ± 0.74		0.55 ± 0.86	
p-value** between male and female	$p < 0.0001$					

* means alcohol drinking ≥ 5 days per week

** by unpaired t-test

78.71% of the studied participants had the middle level. Males had relatively lower mean score of life skills than females, but it was not significantly different, $p > 0.05$. Details are shown in Table 3.

Relationship between risk behaviors and life skills

The relationship between the levels of risk behavior scores and life skill scores was analyzed, it showed significant association, $p < 0.0001$. The studied participants who had a higher level of life skill scores had a lower risk behavior score level (Table 4). In addition, the authors analyzed the relationship between each item of risk behavior and the level of life skill scores, it showed that only risk behavior towards the history of extramarital sex relation without using condoms was significantly associated with the level of life skill scores, $p = 0.0282$. Details are shown in Table 5.

Results from blood screening

Of 166 voluntary participants, 31.33% had positive HBV seromarkers, 6.63% were HBsAg positive, 1.21% were anti-HCV positive and 1.21% were anti-HIV positive (Table 6). There were 15 individuals with positive for HBsAg or anti-HCV or anti-HIV in this study, 11 had risk behaviors more than 1 item and 13 had low level to the middle level of life skill scores. Details are shown in Table 7.

Discussion

Both sexual and parenteral routes are the predominant modes of HBV and HIV transmission. In adults, the transmission is mainly from person-to-person, via sexual contact[2,4,9,22,27]. The spouses of HBV or HIV carriers may acquire the viruses from their carrier spouses and they may spread the viruses to others. Whereas, the major route of HCV transmission is via parenteral route and the minority is via sexual contact[3,6,14]. A previous study of HCV and STD co-infection revealed that gonorrhea increases the risk of HCV infection among women with, or at risk from HIV infection[14]. The infections may affect their neonates and siblings from intra-familial transmission[23-25].

Table 3. Life skill score levels among participants by sex (n = 1,254)

Life skill score levels*	Male		Female		Total	
	No.	%	No.	%	No.	%
Low level (< 14.9 scores)	81	12.92	54	8.61	135	10.77
Middle level (14.9-19.0 scores)	481	76.71	506	80.70	987	78.71
High level (≥ 19.1 scores)	65	10.37	67	10.69	132	10.53
Total	627	100.00	627	100.00	1254	100.00
Total life skill score: $\overline{X} \pm$ SD	16.9 ± 2.1		17.1 ± 2.1		17.1 ± 2.0	
(Min & Max)	(8, 20 scores)		(8, 22 scores)		(8, 22 scores)	
p-value** between male and female	$p > 0.05$					

* Low level is < $\overline{X}$ – SD ; Middle level is > $\overline{X}$ – SD to $\overline{X}$ + SD ; High level is > $\overline{X}$ + SD
** by unpaired t-test

Table 4. Relationship between levels of risk behavior scores and life skill scores among the participants (n = 1,254)

Levels of risk behavior scores	No. of participants	No. (%) of the participants with life skill score levels		p-value
		Low to middle level	High level	
High level (score > 0.77)	223	209 (93.72)	14 (6.28)	
Middle level (0.37-0.77)	668	611 (91.47)	57 (8.53)	$p < 0.0001$*
Low level (score < 0.37)	363	301 (82.92)	62 (17.08)	
Total	1254	1121 (89.39)	133 (10.61)	

* by Chi-square test

Table 5. Relationship between levels of life skill scores and each item of risk behavior among the participants (n = 1,254)

Risk Behaviors	No. (%) of participants with level of life skill score		p-value*
	Low to middle (n = 1121)	High (n = 133)	
1. History of receiving blood and/or hemodialysis			
Yes	81 (7.23)	15 (11.28)	0.1363
No	1040 (92.87)	118 (88.72)	
2. History of contact of blood or blood products			
Yes	91 (8.12)	6 (4.51)	0.1934
No	1030 (91.88)	127 (95.49)	
3. History of tattooing			
Yes	132 (11.88)	14 (10.53)	0.5751
No	989 (88.22)	119 (89.47)	
4. History of injecting drug use			
Yes	19 (1.69)	1 (0.75)	0.3560
No	1102 (98.31)	132 (99.25)	
5. History of jaundice			
Yes	72 (6.42)	10 (7.52)	0.7657
No	1049 (93.58)	123 (92.48)	
6. History of STDs in a previous year			
Yes	13 (1.16)	1 (0.75)	0.5530
No	1108 (98.84)	132 (99.25)	
7. History of regular alcohol consumption			
Yes	171 (15.25)	20 (15.04)	0.9506
No	950 (84.75)	113 (84.96)	
8. History of extramarital sex relation without using condom			
Yes	69 (6.16)	2 (1.50)	
No	1052 (93.84)	131 (98.50)	0.0282*
9. History of sex service			
Yes	36 (3.21)	3 (2.26)	
No	1085 (96.79)	130 (97.74)	0.3919
10. History of anal sex activities			
Yes	14 (1.25)	1 (0.75)	
No	1107 (98.75)	132 (99.25)	0.5161

* by Chi-square test or Fisher's exact test where appropriated

Table 6. Participants with blood screening for HIV, HBV and HCV infections by sex (n = 166)

Sex	No. of participants tested	HBV Seromarker positive				Anti-HCV positive	Anti-HIV positive
		HBsAg ± Anti-HBc	Anti-HBs ± Anti-HBc	Anti-HBc only	Any HBV markers		
Male	82	5 (6.10)	13 (15.85)	8 (9.76)	26 (31.71)	1 (1.22)	1 (1.22)
Female	84	6 (7.14)	14 (16.67)	6 (7.14)	26 (30.95)	1 (1.19)	1 (1.19)
Total	166	11 (6.63)	27 (16.27)	14 (8.43)	52 (31.33)	2 (1.21)	2 (1.21)

The present study of married couples who are one of the target groups, especially in males showed a high percentage of some important risk behaviors towards sexually transmitted and blood-borne infections, such as, regular alcohol consumption (23.80%), tattooing (14.87%), a history of extramarital sex relation without using condoms (8.07%), and a history of sex service before marriage (4.82%). Tattoo, extramarital sex rela-

Table 7. Risk behaviors and level of life skill scores of 15 individuals with HBsAg or anti-HCV or anti-HIV positive

Results fromblood screening	No.	Risk behaviors		Level of life skill scores	
		Yes, ≥ 1 item	No	Low to middle	High
HBsAg positive	11	7	4	9	2
Anti-HCV positive	2	2*	0	2	0
Anti-HIV positive	2	2**	0	2	0
Total	15	11	4	13	2

* One for regular alcohol drinking and one for injecting drug use
** Two having the history of extramarital sex without using condom and sex service

tion, and sex service are known important risk factors for HIV and HBV infections[2,18,20-22]. Previous studies demonstrated that alcohol consumption is an indirect risk behavior for HIV and HBV infections because, after consumption, the subject was more prone to have extramarital sex relations without use of condoms[30,31]. In addition, 2.27% of male participants and 0.28% of female participants had a history of injecting drug use, which is an important risk factor of HIV, HBV, and HCV infections[2,3,6,16,19,24]. Males had a relatively higher percentage of risk behaviors and significantly higher risk behavior scores than females ($p < 0.0001$). In general population, as well as, voluntary blood donors, male blood donors had relatively higher positive rate of HBsAg, anti-HCV, and anti-HIV than females[9].

For life skills, most participants (78.71%) had the middle level and only 10.53% had the high level. Female participants had relatively higher life skill scores than males, but it was not significant ($p > 0.05$). When the authors analyzed the relationship between the levels of life skill scores and the levels of risk behavior scores, it revealed significant association ($p < 0.0001$). The participants who had a higher level of life skill scores had a lower level of risk behavior scores. However, when the authors analyzed in detail, it showed only the history of extramarital sex relation without using condoms among the studied participants associated with the level of life skill score ($p = 0.0282$). WHO (1997) recommended the use of life skill education for avoiding drug injection and for delaying premarital or extramarital sex relations which are major risk behaviors of HIV, HBV and HCV infections among children and adolescents[26].

Results from blood screening, 31.33% of 166 voluntary participants had positive HBV seromarkers, 6.63% were HBsAg positive, 1.21% were anti-HCV positive and 1.21% were anti-HIV positive. When compared with the general population, the overall HBV seromarkers positive seems relatively lower, but HBsAg positive rate was similar to the previous study estimated to be approximately 50-60% positive for overall HBV seromarkers and 5-10% positive for HBsAg[32]. Since 1992, the Thai Ministry of Public Health has implemented a policy of immunization for all newborns against HBV infection by adding HBV vaccine into the existing Expanded Program on Immunization (EPI Program), the HBsAg carrier rate in children under 5 years of age fell from about 5% to only 1% in the year 1997[33]. The anti-HIV positive rate in the present study was relatively higher, whereas, anti-HCV was relatively lower than the recent study in Thai voluntary blood donors which found 0.69% and 2.90%, respectively[9].

Of 166 voluntary participants in blood screening, 15 participants were positive for HBsAg or anti-HCV or anti-HIV. These may transmit the infection to others, especially their couples. Most of them had one or more risk behaviors and had the low to middle level of life skill scores. Whereas, most of sero-negative participants who were negative for HBsAg, anti-HCV, or anti-HIV, had no risk behaviors and had relatively higher score of life skills. These findings supported the WHO recommendation of life skill education for reducing the risk behaviors[26]. However, the present study had a limitation of the low response rate for blood screening. Only 166 individuals voluntarily participated in blood testing because most participants would not like to know their HIV status, which might affect their families.

In conclusion, the present study showed the significant association between the levels of life skill scores and the levels of risk behavior scores among Thai married couples. The participants who had a higher level of life skill scores had a lower level of risk behavior scores. However, when the association was analyzed in detail, it showed only the history of extramarital sex relations without using condoms among

the studied participants associated with the level of life skill score. Thus, to reduce the risk behaviors in married couples, especially the sexual risk behavior, life skills education including self awareness, empathy, critical thinking, communication and interpersonal relationship, decision making, and problem solving should be provided in pre-marital clinics and should be extended into every secondary school and college or university. Group activities with more attractive education should be emphasized in this target group because of the better attitude-changing success it has than formal education.

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พฤติกรรมเสี่ยงและทักษะชีวิตที่เกี่ยวข้องกับการติดเชื้อทางเพศสัมพันธ์และเลือดในคู่สมรสคนไทย

พิพัฒน์ ลักษมีจรัลกุล, สุลี ทองวิเชียร, สมพร เตรียมชัยศรี

การติดเชื้อทางเพศสัมพันธ์และเลือดโดยเฉพาะอย่างยิ่งการติดเชื้อไวรัสตับอักเสบ บี ซี และ เอชไอวี/เอดส์ เป็นปัญหาสาธารณสุขที่สำคัญ คู่สมรสเป็นกลุ่มหนึ่งที่มีความสำคัญ การศึกษาพฤติกรรมเสี่ยง ทักษะชีวิตและความสัมพันธ์ระหว่างกัน เพื่อการพัฒนารูปแบบการป้องกันในลักษณะองค์รวมเป็นสิ่งจำเป็น การศึกษาภาคตัดขวางนี้ได้ศึกษาในคู่สมรส 706 คู่ (1,412 ราย) อายุระหว่าง 15-44 ปี จาก 7 จังหวัด กระจายตามภาคต่าง ๆ ทุกรายได้รับการสัมภาษณ์ประวัติพฤติกรรมเสี่ยงและทักษะชีวิต มีเพียง 166 ราย ที่ยินดีตรวจโลหิตเพื่อหาการติดเชื้อไวรัสตับอักเสบบี ซี และเอชไอวี/เอดส์ ผลการศึกษา พบว่า ร้อยละ 15.30 ของกลุ่มตัวอย่างมีประวัติดื่มสุรา/เหล้าจนอาจขาดสติ ร้อยละ 11.26 มีประวัติสักตามแขน ขา และลำตัว ร้อยละ 5.10 มีประวัติเพศสัมพันธ์นอกสมรสโดยไม่ใส่ถุงยางอนามัย และร้อยละ 2.83 เคยให้บริการทางเพศ เพศชายมีคะแนนประวัติพฤติกรรมเสี่ยงดังกล่าวมากกว่าเพศหญิงอย่างมีนัยสำคัญทางสถิติ ($p<0.0001$) สำหรับทักษะชีวิต พบว่า ร้อยละ 78.71 ของกลุ่มตัวอย่างมีคะแนนทักษะชีวิตอยู่ในระดับปานกลาง เพศชายมีคะแนนทักษะชีวิตเฉลี่ยต่ำกว่าเพศหญิงอย่างไม่มีนัยสำคัญ เมื่อวิเคราะห์ความสัมพันธ์ระหว่างระดับคะแนน ของพฤติกรรมเสี่ยงกับระดับคะแนนทักษะชีวิต พบว่า มีความสัมพันธ์กันอย่างมีนัยสำคัญทางสถิติ ($p < 0.0001$) โดยกลุ่มตัวอย่างที่มีระดับคะแนนทักษะชีวิตสูงจะมีระดับคะแนนพฤติกรรมเสี่ยงต่ำ สำหรับกลุ่มที่ยินดีตรวจโลหิต พบความชุก ของการติดเชื้อไวรัสตับอักเสบ บี ร้อยละ 31.33 ผลบวก HBsAg ร้อยละ 6.63 ผลบวก anti-HCV ร้อยละ 1.21 และ ผลบวก anti-HIV ร้อยละ 1.21 ตามลำดับ