ORIGINAL ARTICLE

Predictors of HIV preventive behaviors among migrants living in the transportation crossroads of Myawaddy Township, Myanmar

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Abstract

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Migration and infrastructure development help fuel the transmission of HIV infection among migrants, and behavior change increases migrants' vulnerability to HIV/AIDS. This study aimed to assess a proportion of having HIV preventive behaviors and its associated factors among migrants at Myawaddy Township in the Thailand-Myanmar border area. A community-based cross-sectional study was conducted among 358 migrants aged 18-49 years who were recruited by two-stage cluster sampling. Data collection was carried out by trained interviewers using a structured questionnaire during the first and second week of April, 2017. The Chi-square test and multiple logistic regression were performed to examine factors associated with HIV preventive behaviors among migrants.

The study revealed that 17.9% of the respondents practised HIV prevention; 17.3% had never had sex; 97.4% had only one sex partner; 4.4% used a condom at last sex during last 12 months; and 19.6% had a history of HIV testing in the last 12 months. The multiple logistic regression showed that migrants who participated in health education sessions were 6.95 times more likely to practise HIV prevention than those who did not (Adj. OR=6.95, 95% CI=3.34-14.45). Moreover, migrants who did not use drugs or alcohol before having sex were 2.49 times more likely to practise HIV prevention (Adj. OR=2.49, 95% CI=1.04-5.95) than those who did.

Policy makers should consider to promote the dissemination of health information among migrants by using all possible channels of communication to boost correct knowledge on HIV prevention. As HIV risk is higher among outbound migrants from Myanmar than inbound, there is a need for HIV prevention education with an emphasis on migrants planning to migrate out of the country.

Keywords: HIV preventive behaviors, migrants, Myawaddy, Myanmar

วารสารสาธารณสุขและการพัฒนา
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ตัวทำนายของพฤติกรรมการป้องกันการติดเชื้อเอชไอวีในกลุ่มแรงงานย้ายถิ่นบนเส้นทางคมนาคมที่ตัดผ่านเมืองเมียวดี ประเทศพม่า

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บทคัดย่อ

เท็ด โก โก อ่อง บังอร เทพเทียน และ จิราพร ชมพิกุล ตัวทำนายของพฤติกรรมการป้องกันการติดเชื้อเอชไอวีในกลุ่มแรงงานย้ายถิ่นบนเส้นทางคมนาคมที่ตัดผ่านเมืองเมียวดี ประเทศพม่า ว. สาธารณสุขและการพัฒนา 2561;16(1):45-61

การโยกย้ายถิ่นฐานและการพัฒนาโครงสร้างพื้นฐานมีผลต่อการติดเชื้อเอชไอวีและการเปลี่ยนแปลงพฤติกรรมเพิ่มโอกาสความเปราะบางต่อการติดเชื้อเอชไอวี/เอดส์ในกลุ่มผู้ย้ายถิ่น ดังนั้นการศึกษานี้จึงมีวัตถุประสงค์เพื่อศึกษาสัดส่วนของการมีพฤติกรรมการป้องกันเอชไอวีและตัวทำนายพฤติกรรมป้องกันการติดเชื้อเอชไอวีของผู้ย้ายถิ่นในเขตเทศบาลนครเมียวดีที่มีเขตพรมแดนติดกับประเทศไทย การศึกษานี้เป็นการศึกษาแบบภาคตัดขวางโดยใช้ชุมชนเป็นฐาน กลุ่มตัวอย่างเป็นผู้ย้ายถิ่นทั้งหมด 358 รายที่มีอายุระหว่าง 18 -49 ปีได้มาโดยการสุ่มตัวอย่างแบบแบ่งกลุ่มสองขั้นตอน เก็บรวบรวมข้อมูลด้วยวิธีการสัมภาษณ์ด้วยแบบสอบถามในช่วงสัปดาห์ที่ 1- 2 ของเดือนเมษายน พศ. 2560 วิเคราะห์ข้อมูลด้วยการทดสอบไคสแควร์ และการวิเคราะห์ถดถอยลอจิสติกพหุคูณ

ผลการศึกษาพบว่ากลุ่มผู้ย้ายถิ่นร้อยละ 17.9 มีพฤติกรรมการป้องกันการติดเชื้อเอชไอวี ประกอบด้วย 17.3% ไม่มีประสบการณ์ทางเพศ 97.4% มีคู่นอนเพียงคนเดียว และ 4.4% มีประวัติการใช้ถุงยางอนามัยครั้งล่าสุดในช่วง 12 เดือนที่ผ่านมา และ 19.6% มีประวัติการตรวจเลือดเพื่อหาเชื้อเอชไอวีในช่วง 12 เดือนที่ผ่านมา จากการวิเคราะห์การถดถอยลอจิสติกพหุคูณพบว่าผู้ย้ายถิ่นที่เข้าร่วมกิจกรรมที่ให้ความรู้ด้านสุขภาพเกี่ยวกับการติดเชื้อเอชไอวีจะมีแนวโน้มถึง 6.95 เท่าที่จะมีพฤติกรรมการป้องกันการติดเชื้อเอชไอวีมากกว่าผู้ย้ายถิ่นที่ไม่เข้าร่วม (Adj. OR = 6.95, 95% CI= 3.34-14.45) ผู้ย้ายถิ่นที่ไม่ดื่มแอลกอฮอร์และเสพสารเสพติดก่อนมีเพศสัมพันธ์จะมีแนวโน้มถึง 2.49 เท่าที่จะมีพฤติกรรมการป้องกันการติดเชื้อเอชไอวีมากกว่าผู้ย้ายถิ่นที่ทำ (Adj. OR = 2.49, 95% CI= 1.04 - 5.95)

ผู้กำหนดนโยบายควรต้องส่งเสริมให้มีการเผยแพร่ผู้ข้อมูลข่าวสารที่ถูกต้องเกี่ยวกับการป้องกันเอชไอวีไปสู่ผู้ย้ายถิ่นในทุกๆช่องทาง เนื่องจากผู้ที่ย้ายถิ่นออกจากพื้นที่มีความเสี่ยงมากกว่าผู้ที่ย้ายเข้ามาในพื้นที่ ดังนั้นนโยบายการป้องกันเอชไอวีควรต้องวางแผนที่จะทำให้ผู้ที่จะเคลื่อนย้ายออกได้รับความรู้และมีพฤติกรรมป้องกันการติดเชื้อเอชไอวี

คำสำคัญ: พฤติกรรมการป้องกันการติดเชื้อเอชไอวี ผู้ย้ายถิ่น เมืองเมียวดี ประเทศพม่า

Introduction

For over three decades, HIV has been a major, worldwide public health threat, and its socio-economic impacts are still affecting low and middle-income countries[1] where the financial effort for combating HIV is waning[2]. In the era of sustainable development goals (SDGs), every action to improve the economy and infrastructure of one country should be taken to mitigate health-related risks for people living in that area, especially vulnerable and under-privileged groups. As a community, ASEAN enacted a free trade agreement in December 2015[3]. Improvement of infrastructure as part of poverty reduction projects of the Asian Development Bank in the Greater Mekong Sub-region (GMS)[4] will increase mobility of people across borders, and this mass migration will affect host communities and the migrants themselves. However, migrants are not considered key players in health, resilience and sustainability[5]. Most of the migrants are usually living away from spouse and family. Sometimes, the language barrier, lack of social protection, inadequate access to HIV health care services, and stigmatization results in HIV risk behaviors and increasing vulnerabilities[6].

Studies among migrant workers in Thailand and Ethiopia have found a low level of condom use[7-8]. The prevalence of Myanmar migrants who have taken an HIV test was lower when compared to that of Cambodian migrants[9]. HIV testing is a cornerstone of HIV case detection, prevention, care and treatment. With the advent of more effective therapies in recent years, early diagnosis is important for optimizing treatment plans and forestalling the progression to AIDS and death. In Thailand, 10% of migrant workers reported having sex with a non-regular partners[10]. In light of these reasons, HIV can be contracted or transmitted in the origin and destination of the migrant's travel path, as well as at points of transit. Thus, migration is an independent factor for HIV transmission. Emigration may also increase HIV vulnerability, not only for the migrants themselves but also for migrant-affected communities and family members left behind[11]. Therefore, in this study, migrants are divided into two types: 1) inbound migrants were defined as people who originated from another area and have lived in the study area for less than five years, and outbound migrants were defined people who were living outside of the study area before moving into that area and have lived in the area for more than five years or local people who have a history of travelling outside of the study area for more than 90 days in the past two years.

Myawaddy, a border township of Myanmar adjacent to Thailand, is situated on the envisioned East-West economic corridor of GMS countries[12]. Migrants in this area pose a significant threat for HIV infection since, in one study, 18% of migrants in the sub-region were HIV[13]. In general, HIV prevalence is higher among mobile populations than the general population[6].

The objective of this study was to explore factors (socio-economic factors, socio-cognitive factors, cues to actions and conditions of substance use) associated with HIV preventive behaviors among migrants along the economic corridor in Myawaddy Township, Myanmar. The findings should be useful for local authorities to be strengthen HIV control and prevention by addressing migrant-specific issues, and in implementing innovative interventions through migrant-friendly services. Moreover, the findings can

be generalized to countries in which migrants are living and working along a transportation corridor.

Methods

Study design and areas

The study was a community-based cross-sectional study among the migrant population age 18-49 years in an urban area of Myawaddy Township, Myanmar. This township is a migrant-dense area and is situated on the transportation route of the East-West Economic corridor connecting GMS countries. While HIV prevalence among other high risk populations, e.g., men who have sex with men and sex workers, was 18.8%, HIV prevalence among the migrant population was 22.5% in that area in 2013[13].

Sampling method

Target population was adult migrants aged 18-49 years who moved to and lived in Myawaddy Township where is crossed by transportation route of the East-West Economic corridor. The sample size was calculated by using a formula for estimating proportion, and assumed a 5% margin of error (d) and 95% confidence interval (CI). The proportion of migrants who used a condom during sex with a female sex worker in the past year (p) was set at 33% in reference to a previous study in that area[13]. With total estimated adult migrant population (N), the required sample size was 326. The sample size was increased to 358 to account for 10% probable non-response.

Data collection procedure

Under the urban area township, there are ten migrant clusters which were defined by using a map showing places where migrants are concentrated. Two-stage cluster sampling was applied to collect the required sample. In the first stage, six migrant clusters were selected by using simple random sampling. The total number of migrants in these six clusters was estimated to be 11,670. In the second stage, samples from each cluster were selected using simple random sampling.

Data collection was conducted between the third week of March and the first week of April, 2017. Two research assistants who had previous experience with field data collection were trained in the meaning of each question, obtaining informed consent, keeping confidentiality of the information they gathered, quality control, and techniques of presenting the questions for participants in an understandable manner. Completeness and accuracy of data were checked by the principal investigator daily. Feedback and suggestions for data collection were shared based on the findings.

Instruments

The instrument was a structured questionnaire which was developed by review of related studies with strong reliability results. The questionnaire has seven parts comprising information about migration status (3 questions), socio-demographic factors (6 questions), knowledge of HIV/AIDS (24 questions), social cognitive factors for HIV/AIDS (43 questions), cues to preventive action (5 questions), assessment of substance use (3 questions) and assessment of HIV preventive behaviors (4 questions). Questions for assessment about level of knowledge were adapted from the UNGASS criteria[14] and population-based survey of HIV/AIDS knowledge and attitudes in the general public in Bandar-Abbas, Iran[15]. Knowledge was separated into low and high levels based us-

ing 80% of total scores as a cut-off. Questions on perceptions related to the Protective Motivation Theory were adapted from previous studies with strong reliability results[16-18]. Every construct of HIV Protective Motivation Theory were classified on a 3-point Likert scale: agree, uncertain and disagree. The research instrument was first developed in English and then translated into Burmese. A pilot test of the instrument was conducted among a group of people equal to 10% of the sample size in the nearest township with similar characteristics of migrants and health care services. Regarding the reliability of the questionnairre, Kuder-Richardson 20 (KR-20) for the knowledge and Cronbach's alpha for the perception were 0.76 and 0.81 respectively.

Outcome Variables

HIV sexual preventive behaviors in the prior 12 months were employed as the outcome variables. The first three outcome variables were as follows: (1) Sexual experience in the life time. ("No" coded as 1; "Yes" coded as 0); (2) Condom use at last sex in the past year ("No" coded as 0; "Yes" coded as 1) and (3) Having multiple sex partners in the past year. ("No" coded as 1; "Yes" coded as 0). The score ranges from 0-3, and those scoring one or more were classified as those having HIV sexual preventive behaviors (0 coded as 0; 1-3 score coded as 1). HIV testing in the past 12 months also was employed as the outcome variables ("No" coded as 1; "Yes" coded as 0). Finally, a composite measure of these factors was created by summing their values, since these interact to produce a different preventive profile for each person. The composite score ranges from 0 to 2, and having a score of 1 or more indicates engaging in at least one preventive behavior. Those with a score of 2 were defined as having HIV preventive behavior.

Statistical analysis

Descriptive statistics include frequency tables with numbers and percentages. For inferential statistics, Chi square test was used to examine a significant association between each independent variable and HIV preventive behaviors. Multiple logistic regression was used to examine predictors of HIV preventive behaviors.

Ethical considerations

The study proposal was reviewed and approved by the Office of the Committee for Research Ethics, Faculty of Social Sciences and Humanities, Mahidol University Institutional Review Board (COA. No. 2017/053.0803). Before each interview, the objectives of this study and importance of participation were explained to all participants. After that, oral informed consent was obtained from each participant to ensure that participation was strictly voluntary.

Results

A total of 358 participants were included in this study (response rate of 100%). Among them, 34% and 26% were migrants from Mon State and Bago Division, respectively. In terms of type of migrants, 64% were inbound migrants and 36% were outbound migrants. A majority (85%) were migrating to this area for job opportunities.

Table 1 shows all independent variables. Among all participants, 77.4% were male and 22.6% were female. Since the main reason for migration into this

area was economic instability, most of the inbound migrants were male and working as manual laborers. Nearly half (42.5%) of the participants aged 25-35 years with mean age of 30.8 years and standard deviation of 9.2 years. While 42.6% were illiterate or finished primary school, 57.4% complted middle school or above. In relation to employment status, inbound migrants were more employed than outbound migrant. Most of the migrants (85.5%) had current employment. A majority (71.2%) of participants were married and their wives accompanied them. By types of migrant, married migrants who had being staying together with their spouse were more likely to be outbound (p-value = 0.001). Regarding monthly individual income, 62.1% had monthly income of ≥150,000 Myanmar Kyat or above (≥150 USD). As inbound migrants were more likely to be employed and had the intention to earn money, they had a higher level of income.

Levels of social cognitive factors

Regarding general knowledge about HIV, 93.3% of participants knew that HIV is a contagious disease, but 252 (70.4%) incorrectly answered that there is a vaccine for HIV. Two hundred and twenty-eight (63.7%) migrants had a low level of general knowledge about HIV. The majority (185, 51.7%) had a high level of knowledge about modes of transmission of HIV. But 197 (55%) and 258 (72.1%) migrants believed (incorrectly) that HIV is transmitted through coughing/ sneezing and mosquito bites, respectively. Most of the respondents showed that they had correct nowledge about preventive methods for HIV infection by answering five relevant questions. Three hundred and one respondents (84.1%) had a high level of knowledge about preventive methods for HIV. When overall HIV knowledge level was evaluated, 191 (53.4%) and 167 (46.6%) migrants had high and low level of knowledge regarding HIV, respectively. By type of migrant, outbound migrants were more likely to have high level of knowledge about HIV.

When perception about severity of HIV infection was assessed, 193 (53.9%) respondents had a high level of self-confidence to practice HIV preventive behaviors. Regarding level of self-efficacy, there was no difference between inbound and outbound migrants. According to Protective Motivation Theory, threat and coping appraisals were formed to assess associations with HIV preventive behaviors. While half of the participants had a high level of coping appraisal, over half had a high level of high threat appraisal. Although there was not much difference in level of threat appraisal between the two types of migrants, a higher proportion of outbound migrants had a high level of coping appraisal than inbound.

Cues to HIV preventive actions

In this study, information about HIV/AIDS, distribution of condoms, attending health education sessions about HIV and information about health care services for people living with HIV (PLHIV) were assessed as cues to practicing HIV preventive behaviors. Among 358 participants, 238 (66.5%) had received information about HIV/AIDS in the last 12 months through various kinds of media.

Regarding availability of condoms, approximately 22% of participants reported that they had received condoms during the last 12 months, free of charge. Only 118 (33%) had attended health education sessions within the past 12 months. Places where

PLHIV can access health care service were known by 40.4% (144) of participants. In this study, although there were no differences between the two types of migrants in receiving HIV/AIDS information, condom and health education sessions, outbound migrants were more likely to know where health care services for HIV/AIDS are available in the study area (p value = 0.002)

Assessments of substance use

Among 358 participants, 208 (58.1%) drank alcohol within the last 3 months. Only 12 (3.4%) participants had used mood-altering drugs within the last 12 months. For those who had sex within the past 12 months, 92 (25.8%) said they used alcohol/ drugs before sex. In this study, there were no distinct differences about substance use practices between inbound and outbound migrants.

Table 1 Distribution of respondents by independent variables and types of migration

Independent variables	Total		Inbound migrants		Outbound migrants	
	n	(%)	n	(%)	n	(%)
Socio-demographic factors						
Sex						
Male	277	(77.4)	185	(80.4)	92	(71.9)
Female	81	(22.6)	45	(19.6)	36	(28.1)
Age (years)						
18-24	94	(26.3)	67	(29.1)	27	(21.1)
25-35	152	(42.5)	106	(46.1)	46	(35.9)
36-49	112	(31.3)	57	(24.8)	55	(43.0)
Education						
Illiterate or primary school	152	(42.6)	96	(41.9)	56	(43.8)
Middle school and above	205	(57.4)	133	(58.1)	72	(56.3)
Current employment						
Unemployed	52	(14.5)	28	(12.2)	24	(18.8)
Employed	306	(85.5)	202	(87.8)	104	(81.3)
Marital status						
Single/separated/divorced/widowed	103	(28.8)	80	(34.8)	23	(18.0)
Married & live with partner	255	(71.2)	150	(65.2)	105	(82.0)
Individual current monthly income (MMK)						
< 15,0000	134	(37.9)	82	(36.1)	52	(40.9)
≥ 15,0000 and above	220	(62.1)	145	(63.9)	75	(59.1)
Levels of social cognitive factors						
Knowledge about HIV						
Low	191	(53.4)	136	(59.1)	55	(43.0)
High	167	(46.6)	94	(40.9)	73	(57.0)

Table 1 Distribution of respondents by independent variables and types of migration (Conts.)

Independent variables	Total		Inbound migrants		Outbound migrants	
	n	(%)	n	(%)	n	(%)
Self-efficacy						
Low	165	(46.1)	106	(46.1)	59	(46.1)
High	193	(53.9)	124	(53.9)	69	(53.9)
Threat appraisal						
Low	169	(47.2)	110	(47.8)	59	(46.1)
High	189	(52.8)	120	(52.2)	69	(53.9)
Coping appraisal						
Low	179	(50.0)	123	(53.5)	56	(43.8)
High	179	(50.0)	107	(46.5)	72	(56.3)
Cues to HIV preventive actions (last 12 months)						
Receiving information about HIV/AIDS						
No	120	(33.5)	75	(32.6)	45	(35.2)
Yes	238	(66.5)	155	(67.4)	83	(64.8)
Receiving condoms						
No	279	(78.2)	178	(77.7)	101	(78.9)
Yes	78	(21.8)	51	(22.3)	27	(21.1)
Receiving health education sessions for HIV						
No	240	(67.0)	155	(67.4)	85	(66.4)
Yes	118	(33.0)	75	(32.6)	43	(33.6)
Receiving information about HIV treatment						
No	212	(59.6)	150	(65.5)	62	(48.8)
Yes	144	(40.4)	79	(34.5)	65	(51.2)
Substance use						
Alcohol Drinking						
Yes	208	(58.1)	136	(59.1)	72	(56.3)
No	150	(41.9)	94	(40.9)	56	(43.8)
Mood-altering drug use (last 12 months)						
Yes	12	(3.4)	8	(3.5)	4	(3.1)
No	345	(96.6)	221	(96.5)	124	(96.9)
Used any drug or alcohol before having sex (last 12 months)						
Yes	92	(25.8)	53	(23.1)	39	(30.5)
No	265	(74.2)	176	(76.9)	89	(69.5)

HIV preventive behaviors

In this study, while 17.3% of participants answered that they had no sexual experience, 82.7% had sex before. Of the sexually-experienced participants, 93% said they had sex either with their regular or non-regular partner(s) within the last 12 months. Among the people with sexual experience within the last 12 months, 2.6% revealed that they had more than one sexual partner, and 8.8% participants had sex with a non-regular partner(s). For last sex in the past 12 months, 3.4% said they used a condom. Among the participants who had sex with a non-regular partner(s), 22.7% used condoms for every episode of sex. Only 4.7% said that they used a condom at their first sex. Their sexual debut was at age between 14 and 38 years. Mean age at their first sex was 21.6 years.

Regarding HIV testing, 39.9% of participants had undergone HIV testing at least one time in their life. Among them, 49% had an HIV test within the last 12 months, and 88.4% knew their HIV sero-status. Among the participants who had an HIV test within the last 12 months, 43% said that curiosity about their HIV status was the main reason for undergoing HIV testing. Among the participants who had no HIV test within the last 12 months, being too busy with daily tasks, not knowing places where HIV testing is available and belief in themselves about HIV infection were the main reasons for not going for HIV testing.

The behaviors of the participants to prevent sexually-transmitted HIV are presented in Table 2. In this study, being a virgin, no multiple sexual partners in the last 12 months and using a condom at last sex in the last 12 months were considered as preventive behaviors for HIV infections. Among all participants, 88.8% had at least one preventive sexual behavior. Only 19.6% had an HIV test in the past 12 months. Preventive sexual behaviors and having an HIV test in the last 12 months were not much different between inbound and outbound migrants.

For scoring of HIV preventive behaviors, sexual preventive behavior or having an HIV test were defined as a score of 1 resulting in a minimum score of 0 and a maximum of 2. Scores of 0 or 1 were recoded as "no HIV preventive behavior" and comprised 82.1%; the remaining 17.9% were considered to practise HIV prevention.

Table 2 Distribution of respondents by HIV preventive behaviors and types of migration

Variables	Total		Inbound migrants		Outbound migrants	
	n	(%)	n	(%)	n	(%)
Preventive sexual behavior						
No	40	(11.2)	22	(9.6)	18	(14.1)
Yes	318	(88.8)	208	(90.4)	110	(85.9)
HIV testing in last 12 month						
No	288	(80.4)	188	(81.7)	100	(78.1)
Yes	70	(19.6)	42	(18.3)	28	(21.9)
Total score of HIV preventive behaviors						
0	34	(9.5)	20	(8.7)	14	(10.9)
1	260	(72.6)	170	(73.9)	90	(70.3)
2	64	(17.9)	40	(17.4)	24	(18.8)
HIV preventive behaviors						
No (0-1)	294	(82.1)	190	(82.6)	104	(81.3)
Yes (2)	64	(17.9)	40	(17.4)	24	(18.8)

Predictors of HIV preventive behaviors

The significant independent variables from the Chi-square test or literature review or theories were included in the multiple logistic regression to identify predictors of preventive sexual behaviors, having an HIV test in the last 12 months, and HIV preventive behaviors. In this study, married migrants who lived with their spouse were 3.82 times more likely to engage in HIV-preventive sexual behavior than those with other marital statuses (Adj OR=3.82, 95% CI=1.63 - 8.92). Regarding HIV testing within the last 12 months, migrants who attended health education sessions about HIV/AIDS in the last 12 months were 6.35 times more likely to have an HIV test than those who did not (Adj OR = 6.35, 95% CI=3.12-12.92). Likewise, migrants who had exposure to a health education session in the last 12 months were 6.95 times more likely to have HIV preventive behaviors than those who had no exposure (Adj OR=6.95, 95% CI: 3.34-14.45). Moreover, migrants who did not consume either alcohol or mood-altering drugs before sex were 2.49 times more likely to engage in HIV preventive behaviors than those who did (Adj OR=2.49, 95% CI=1.04-5.95).

Table 3 Multiple logistic regression for predictors of HIV preventive behaviors

Factors		Preventive sexual behaviors		HIV testing in the last 12 months		HIV preventive behaviors	
		Adj OR	(95% CI)	Adj OR	(95% CI)	Adj OR	(95% CI
Socio-Demographic factors							
Type of migrant							
	Inbound	1.89	(0.65 - 2.11)	2.45	(0.44 - 2.78)	1.98	(0.67 - 3.21)
	Outbound	1		1		1	
Sex							
	Male	1		2.51	(0.82 - 7.67)	2.02	(0.66 - 6.24)
	Female	1.13	(0.28 - 4.59)	1		1	
Age	(years)						
	18-24	2.78	(0.95 - 8.12)	2.2	(0.90 - 5.30)	2.26	(0.92 - 5.57)
	25-35	0.99	(0.44 - 2.27)	1.2	(0.60 - 2.60)	1.37	(0.62 - 3.03)
	36-49	1		1		1	
Education							
	Illiterate or primary school	1		1.61	(0.83 - 3.12)	1.51	(0.76 - 2.99)
	Middle/High school	1.08	(0.51 - 2.32)	1		1	
Current employment							
	Unemployed	1		1		1	
	Employed	1.73	(0.42 - 7.20)	1.33	(0.37 - 4.74)	1.95	(0.51 - 7.43)
Marital status							
	Single/separated	1		1		1	
	Married (staying together)	**3.82**	**(1.63 - 8.92)***	1.79	(0.81 - 3.95)	1.63	(0.72 - 3.70)
Individual current monthly income (MMK)							
	< 150,000	1		1.05	(0.51 - 2.16)	1	
	≥ 150,000	1.16	(0.52 - 2.62)	1		1.07	(0.5 - 2.26)
Levels of perception							
Threat appraisal							
	Low	1		1.55	(0.83 - 2.89)	1.31	(0.68 - 2.50)
	High	1.42	(0.69 - 2.92)	1		1	
Coping appraisal							
	Low	2.06	(0.85 - 4.98)	1.06	(0.51 - 2.22)	1.36	(0.63 - 2.94)
	High	1		1		1	
Self-efficacy							
	Low	1		1		1	
	High	1.18	(0.49 - 2.84)	1.99	(0.95 - 4.15)	1.64	(0.76 - 3.50)
Level of Knowledge about HIV							
	Low	1		1		1	
	High	1.76	(0.78 - 3.95)	1.54	(0.78 - 3.04)	1.83	(0.90 - 3.73)
Cues To HIV Preventive action at last 12 months							
Receiving information about HIV/AIDS							
	No	1.39	(0.62 - 3.13)	1.18	(0.55 - 2.50)	1.05	(0.47 - 2.32)
	Yes	1		1		1	

Table 3 Multiple logistic regression for predictors of HIV preventive behaviors (Conts.)

Factors	Preventive sexual behaviors		HIV testing in the last 12 months		HIV preventive behaviors	
	Adj OR	(95% CI)	Adj OR	(95% CI)	Adj OR	(95% CI
Receiving condoms						
No	1.4	(0.55 - 3.56)	1		1	
Yes	1		1.38	(0.68 - 2.81)	1.38	(0.67 - 2.87)
Receiving health education sessions for HIV						
No	1		1		1	
Yes	1.33	(0.55 - 3.22)	**6.35**	**(3.12-2.92)*** **	**6.95**	**(3.34-4.45)*** **
Receiving information about HIV treatment						
No	1		1.13	(0.58 - 2.18)	1	
Yes	1.65	(0.73 - 3.71)	1		1.21	(0.62 - 2.38)
Substance use						
Alcohol Drinking (last 3 months)						
No	2.11	(0.77 - 5.81)	1		1	
Yes	1		1.2	(0.54 - 2.65)	1.12	(0.49 - 2.54)
Mood-altering drug use (last 12 months)						
No	1.31	(0.23 - 7.34)	1.01	(0.10 - 2.94)	1.04	(0.11 - 2.43)
Yes	1		1		1	
Used drugs or alcohol before having sex (last 12 months)						
No	1.25	(0.49 - 3.16)	2.15	(0.94 - 4.90)	**2.49**	**(1.04 - 5.95)***
Yes	1		1		1	

* Significant at $p < 0.05$

*** Significant at $p < 0.001$

Discussion

Overall, HIV preventive behaviors were low among migrants in Myawaddy Township, Thailand-Myanmar border area. In this study, respondents who attended one or more health education sessions about HIV within the last 12 months were about 7 times more likely to engage in HIV preventive behaviors. Migrants who did not consume either alcohol or drugs before sex were 2 times more likely to engage in HIV preventive behaviors than those who did.

In this study, it was found that economic need is the main reason for migration because 85.2% migrated to seek jobs. Under half (43.3%) were working as unskilled manual laborers. Most of the participants (60.3%) received a monthly income below 150,000 Myanmar Kyat (nearly 150 USD). There may be several possible reasons why the respondents migrated to this area: pull factors (attractive daily wages, plenty of job opportunities, improvement of infrastructure and transportation routes); and push factors (scarcity of jobs and post-impacts of natural disasters in their

place of origin)[12].

This study gives important information regarding the HIV preventive behaviors of migrants, socio-demographics features, socio-cognitive factors, cues to actions and substance use practices. Among 358 participants, 17.3% reported that they were virgins. Although this figure is similar to previously reported findings among migrants in Myawaddy[12], it is low when compared with another study among youth in Côte d'Ivoire (33%)[19].

Regarding sex with multiple partners, 97.4% of participants refrained from sex with multiple partners in the last 12 months. This finding was consistent with that of migrants from rural areas of China[20] and Latina immigrants in South Florida[21]. This finding is higher than in other studies regarding multiple sexual behavior of migrants[7, 20-23]. The current study also found that 8.8% of participants who had sex within the last 12 months had sex with a non-regular partner(s). This finding is consistent with studies of cross-border migrants in Thailand9. Only 22.7% of participants who had history of a non-regular sex partner used condoms consistently. This finding was consistent with a study of rural-to-urban male migrants in Shanghai, China, but is much lower than that of other studies[7, 8, 10, 21, 24]. Three-fourths of participants in this study perceived that they had no risk for HIV infection, and 69% believed that using condoms makes sex less enjoyable. This could explain the lower level of condom use with a non-regular partner[10].

In relation to condom use at last sex, 3.4% of participants who had ever have sex in their life used a condom at last sex within the last 12 months. While this figure was similar with a similar study in Thailand[10], it was lower when compared with other studies of migrants in the US and India[21, 25].

In this study, 19.6% of participants had undergone HIV testing within the last 12 months. This finding was consistent with HIV testing coverage among Myanmar migrants in Thailand10 and in Myawaddy[12]. The use of HIV testing was lower compared to other studies among migrants in Ethiopia and China[7, 26-27]. Relatively low history of HIV testing among migrants may be related fear, disclosure problems, lack of health knowledge and information about HIV and AIDS, lack of health care service accessibility and unfamiliarity with the local contexts[12].

Migrants who were married (staying together with spouse) were 4 times more likely to engage in HIV preventive sexual behaviors than ever-married migrants. This finding is similar to the findings of other studies[12, 22, 28] in which married migrants practice more HIV preventive behaviors than those with other marital statuses. For HIV testing within the last 12 months, migrants who had participated in health education sessions about HIV/AIDS were 6 times more likely to go for HIV testing than those without exposure to these sessions. Although Myanmar youth who had higher education, had exposure to an NGO clinic, and currently had a sexual partner, were more likely to have a HIV test, only exposure to one or more health education sessions was a predictor of HIV testing among this sample of migrants[29]. Since a high level of knowledge about HIV associated with HIV testing, it is possible that the knowledge gained from health education encouraged those respondents to go for HIV testing.

For HIV preventive behaviors, migrants who attended health education sessions about HIV within the last 12 months were about 7 times more likely to

engage in HIV preventive behaviors. This finding is similar to findings in previous studies in Thailand[10] and Ethiopia[23]. Additionally, this study showed migrants without a history of substance use before having sex within the last 12 months were about 2.5 times more likely to have HIV preventive behaviors than those with history of substance use. This finding was consistent with a study of migrants in China[30].

According to the National Strategic Plan (2016-2020) for HIV and AIDS in Myanmar, migrants are regarded as a vulnerable population for HIV/AIDS[31]. However, merely promoting prevention of sexual risk for HIV is not enough. More data are needed on the routes of HIV transmission among Myanmar migrants who contracted HIV before, during or after migration. Then target prevention interventions can be tailored to the different groups of current or potential migrants.

In this study other constructs of Preventive Motivation Theory did not show independent association with HIV preventive behavior. However, previous studies did find a significant effect on HIV preventive behaviors[7, 10, 24, 27, 32-34]. This difference may be due to the summary outcome variable in this study which was a combination of different categories of preventive behavior, while other studies used an individual component. Moreover, there is no association between type of migrant (inbound and outbound) and HIV preventive behaviors.

The sample of migrants was living in an environment where people were culturally sensitive to morality and sexual issues. Thus, there might be a social desirability bias in response to some questions. In order to reduce this limitation, well-trained interviewers were used and confidentiality was assured. Since the validity of the response required accurate recall for some items, there may be a recall bias. The study used a cross-sectional design, which limits ability to establish temporal precedence and draw causal inferences, and these data cannot fully explain the process of behavior change which is dynamic.

Recommendations

In the era of sustainable development goals, economic and infrastructure development in a community is often accompanied with undesirable effects on vulnerable groups like migrants. The findings from this study indicate that condom use at last sex and HIV testing are still lower for migrants than for other population groups. Moreover, inbound migrants had lower knowledge and still lack information about health services. Participation in health education sessions and avoidance of substance use before having sex have a positive effect on HIV preventive behaviors. Based on these findings, targeted intervention programs, such as community-based outreach to places where migrants are concentrated, could be a cost-effective approach. Based on these findings, migrants are still underprivileged in knowledge and accessibility to health information. Therefore, policy makers should consider dissemination of health information among migrants by using all possible channels of communication to boost knowledge on HIV/AIDS.

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