

ORIGINAL ARTICLE

# Condom use at last sex and associated factors among male migrant workers in a coastal area of Thanbyuzayat Township, Mon State, Myanmar

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## Abstract

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Migrants have been considered at risk of acquiring and spreading HIV infection as bridging populations. Condom use is considered an effective strategy in protecting against transmission of sexually transmitted infections (STI), including HIV. Therefore, this study aimed to explore the prevalence and factors associated with condom use at last sex among male migrant workers in a coastal area of Thanbyuzayat Township, Mon State, Myanmar.

A community-based cross-sectional study was conducted from April to May 2018. A total of 420 male migrant workers of sexually active age (18-49 years) who had sex within the last 12 months were selected by cluster random sampling. The data were collected by a face-to-face interview with structured questionnaires. The questionnaires were developed according to social cognitive theory (SCT) consisting of three major components: socio-environmental factors, psycho-social factors and condom use behavior at last sex. Prevalence of condom use at last sex was 21.2%. Younger age group (Adj OR=2.88, 95% CI =1.38-6.01), migrants from other regions (Adj OR=2.40, 95% CI=1.15-5.01), length of stay less than 1 year (Adj OR=2.40, 95% CI=1.31-4.40), not currently married or living with a partner (Adj OR=5.13, 95% CI =2.85-9.24), condom accessibility [Fair (Adj OR=2.42, 95%CI =1.08-5.40) and Easy (Adj OR=2.96, 95% CI=1.49-5.89)], poor knowledge about condom use (Adj OR=3.74, 95% CI =1.95-7.15) and positive partner expected outcomes (Adj OR=2.09, 95% CI =1.19-3.68) were associated with condom use at last sex. The key finding of this study suggests that provision of HIV service packages to migrant clusters, including condom distribution is needed.

**Keywords:** Condom use, male migrant workers, Myanmar

# การใช้ถุงยางอนามัยในการมีเพศสัมพันธ์ครั้งล่าสุดและปัจจัยที่เกี่ยวข้องของกลุ่มแรงงานย้ายถิ่นเพศชายในเขตชายฝั่งของเขตตันบิวสะแยต, รัฐมอญ ประเทศพม่า

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## บทคัดย่อ

กรี ตัน วินส์ โซ อะ หงษ์ และ บังอร เทพเทียน การใช้ถุงยางอนามัยในการมีเพศสัมพันธ์ครั้งล่าสุดและปัจจัยที่เกี่ยวข้องของกลุ่มแรงงานย้ายถิ่นเพศชายในเขตชายฝั่งของเขตตันบิวสะแยต, รัฐมอญ ประเทศพม่า ว. สาธารณสุขและการพัฒนา 2561;16(3):15-28

กลุ่มประชากรแรงงานย้ายถิ่นได้รับการพิจารณาว่ามีความเชื่อมโยงที่จะเสี่ยงได้รับเชื้อไวรัสเอชไอวี การใช้ถุงยางอนามัยถือว่าเป็นกลยุทธ์ที่มีประสิทธิภาพในการป้องกันการแพร่เชื้อโรคติดต่อทางเพศสัมพันธ์ รวมทั้งเอชไอวี ดังนั้นการศึกษาครั้งนี้จึงมีวัตถุประสงค์เพื่อศึกษาความชุกและปัจจัยที่มีผลต่อการใช้ถุงยางอนามัยในเพศสัมพันธ์ครั้งสุดท้ายของกลุ่มประชากรแรงงานย้ายถิ่นเพศชายในเขตชายฝั่งของเมือง ตันบิวสะแยต รัฐมอญประเทศพม่า การศึกษาครั้งนี้เป็นการศึกษาแบบภาคตัดขวางโดยใช้ชุมชนเป็นฐาน ดำเนินการเก็บรวบรวมข้อมูลในเดือนเมษายนและพฤษภาคม 2561 กลุ่มตัวอย่างมีอายุ 18-49 ปีที่มีเพศสัมพันธ์ในช่วง 12 เดือนที่ผ่านมาจำนวน 420 คน ข้อมูลถูกเก็บรวบรวมโดยวิธีการสัมภาษณ์กับแบบสอบถามที่มีโครงสร้าง แบบสอบถามได้รับการพัฒนาตามทฤษฎีความรู้ความเข้าใจทางสังคมซึ่งประกอบด้วยองค์ประกอบหลักสามส่วนได้แก่ ปัจจัยทางสังคมและสิ่งแวดล้อม ปัจจัยทางจิตสังคมและพฤติกรรมการใช้ถุงยางอนามัยที่มีเพศสัมพันธ์ครั้งสุดท้าย

ความชุกของการใช้ถุงยางอนามัยในเพศสัมพันธ์ครั้งสุดท้ายเท่ากับ 21.2% ปัจจัยที่มีความสัมพันธ์กับการใช้ถุงยางอนามัยในเพศสัมพันธ์ครั้งสุดท้ายได้แก่ กลุ่มอายุน้อย (Adj OR = 2.88, 95% CI = 1.38-6.01), ผู้ที่ย้ายถิ่นมาจากภูมิภาคอื่นๆ (Adj OR = 2.40, 95% CI = 1.15-5.01) ระยะเวลาที่อาศัยในชุมชนน้อยกว่า 1 ปี (Adj OR = 2.40, 95% CI = 1.31-4.40) ปัจจุบันยังไม่แต่งงานหรืออยู่ร่วมกับคู่นอน (Adj OR = 5.13, 95% CI = 2.85-9.24) ความสามารถในการเข้าถึงถุงยางอนามัยระดับปานกลางและง่าย [Fair (Adj OR = 2.42, 95% CI = 1.08-5.40) และ Easy (Adj OR = 2.96, 95% CI = 1.49-5.89)] ความรู้เกี่ยวกับการใช้ถุงยางอนามัยน้อย (Adj OR = 3.74, 95% CI = 1.95-7.15) และความคาดหวังการใช้ถุงยางอนามัยกับคู่นอนในทางบวก (Adj OR = 2.09, 95% CI = 1.19-3.68) ข้อค้นพบที่สำคัญของการศึกษาครั้งนี้แสดงว่าควรมีการจัดเตรียมชุดบริการด้านการป้องกันเอชไอวีให้แก่กลุ่มผู้ย้ายถิ่นซึ่งรวมถึงการแจกถุงยางอนามัยโดยเฉพาะคู่สมรส

คำสำคัญ: การใช้ถุงยางอนามัย แรงงานย้ายถิ่นเพศชาย ประเทศพม่า

## Introduction

Condom use is considered as an effective method in protecting against transmission of sexually transmitted infections (STI), including HIV. The Myanmar National Strategic Plan for HIV/AIDS had set a target of 90% condom use at last sex by priority populations, such as sex workers, men who have sex with men (MSM), people who inject drugs (PWID), transgender people, prisoners and migrants. At the time of this study, measure of prevalence of condom use in Myanmar which were available for only two risk groups, such as PWID and MSM were lower than the nationally targeted prevalence (22.9% and 77.1% respectively)<sup>1</sup>.

The India National AIDS Control Organization (NACO) stated that migrants are considered infectious-disease bridging populations who are at risk of contracting HIV through closer proximity to high-risk groups and then transmitting the virus to others during their travels<sup>2</sup>. One study from India found that heterosexual married women who had a monogamous sexual relationship with their husband have become a high-risk group for STI<sup>3</sup>. In Myanmar, rural-to-urban migration is rising, with conservative estimates of around 11 million adults involved in circular migration<sup>1</sup>. It is believed that this circulation of migrant workers may contribute to HIV transmission between low-prevalence rural and high-prevalence urban areas, leading to nationwide awareness programs targeting migrant families<sup>2,4</sup>.

Previously, disease prevention campaigns were based on fear arousal. However, strategies have shifted to motivation for behavior change through self-efficacy skills<sup>5</sup>. Self-efficacy models have been successfully tested in a variety of risk groups for HIV

transmission risk behavior, including sexually-active heterosexuals<sup>6</sup>.

Sexual risk behavior resulting from substance abuse is a growing area of scientific focus due to its role as a potential risk factor for the transmission of HIV and other STI<sup>7</sup>. Even if substance use is not a major driving factor for HIV transmission, it can indirectly affect risk by stimulating sex behavior<sup>8</sup>. A study in Myanmar found that substance use is associated with risky sexual behavior including lack of condom use<sup>9</sup>.

According to the 2014 Myanmar census, there were over 1 million people living in the Mawlamyine region where the in-migration rate is 35 per 1,000 population<sup>10</sup>. In this region, Thanbyuzayat is a famous city for pagodas, beaches, seafood production and rubber plantations, creating job opportunities for migrant workers throughout the country. There were limited studies on HIV sexual risk behavior among internal migrants in the townships of Myanmar. Even though a recent study found that self-efficacy and alcohol use were not associated with protective sexual behavior among internal migrant workers, studies on the association between condom use, the key components of Social Cognitive Theory (SCT), such as self-efficacies and outcome expectancies, and substance use are very limited<sup>11</sup>. Moreover, males have higher HIV sex risk behaviors than females because of sexual exposure, socio-cultural factors and alcohol consumption<sup>11-12</sup>. Thus, this research aimed to determine the prevalence of condom use and the factors associated with condom use at last sex among male migrant workers in a township of Myanmar with a high in-migration rate.

## Methods

A community-based cross-sectional study was conducted among a sample of 420 male migrant workers age between 18 to 49 years who had sex in the past 12 months. Data were collected in April and May 2018. This study was conducted in a coastal area of Thanbyuzayat Township, Mon State. The required sample (n=420) was estimated by using a formula for estimating proportion and assumed as 5% margin of error (d), 95% confidence interval (CI) and proportion of 50 % as prevalence of condom use was unknown in this study area. The sample size was increased by 10% to allow for incorrectly completed questionnaires. The required sample size was 420. Cluster random sampling techniques were used in this study. In this area, migrants were living as group, called 'clusters' which were located inside or near to the villages. There were ten clusters in the study areas, and eight clusters were chosen by simple random sampling using a male migrants list obtained from migrant leaders. From each cluster, 20 to 100 male migrants were chosen randomly and proportionately to obtain the required sample of 420 respondents.

A research team including five trained research assistants conducted face to face interview to complete structured questionnaires. Interview processes were carried out at the working sites or homes and instructed to ensure respondents' sense of privacy. Before conducting the survey, participants were given an explanation of the study objectives and procedures, and provided written informed consent. They had been assured of confidentiality and told that they could terminate participation at any time without prejudice. All data were treated anonymously using study identification numbers. The study protocol was

approved by the Ethical Review Board of Mahidol University (Approval Number: 2018/ 02-040).

The structured questionnaire was developed based on the literature review and adapted from previous related studies. The validity of the questionnaire was checked by experts and the thesis advisory team. The questionnaire was translated by the researcher together with one research expert from Myanmar, and reviewed by two master's candidates. A pretest of 30 respondents was carried out in a different study area (Mawlamyine Township) in order to measure reliability and validity. The questionnaire was revised and modified after the pretest according to respondents' feedback.

SCT explains that the behavioral, cognitive and personal factors and environmental events operate as interacting determinants that influence each other bi-directionally. In this research, the structured questionnaire developed according to SCT principles<sup>5</sup> and consists of three major components: Socio-environmental factors, psychosocial factors and condom use behavior. In this study, condom use was defined as use of a condom for vaginal, anal or oral sex at last sex.

Questions regarding socio-demographic background included age, occupation, place of residence at origin, total length of stay, frequency of visiting home, religion, ethnicity, marital/partner status, income and education. Socio-environmental factors included access to condoms and peer social norms on condom use. Condom accessibility was measured by three dimensions: price, time and place. For example, respondents were asked "Can you get condom with affordable price or for free?"<sup>13</sup>. A score of "1" was given for "Yes" and "0" for "No". A total score of

3 denotes easy accessibility; 2 for fairly accessible, 1 or 0 for poor accessibility. Cronbach's Alpha for this measure was 0.82. Peer social norms were measured by questions like "Most of my friends think it is important to use a condom when having sex with a new partner." This component included five questions with a four-point Likert scale ranging from strongly disagree to strongly agree<sup>14</sup>. The median value was used to determine positive and negative groups, and Cronbach's Alpha for this peer social norms was 0.92.

The questions about psychosocial factors included 40 questions regarding knowledge about condoms, condom use self-efficacy, self-control self-efficacy, sexual self-efficacy, hedonistic outcomes and partner-expected outcomes. Questions regarding knowledge were adopted from a previous related study<sup>15</sup>. A total of five questions were asked and scores ranged from 0 to 5; 4 was considered as 'high' knowledge. The Kuder–Richardson Formula 20 (KR-20) of 0.56 was found for the knowledge questions. Likewise, self-efficacy questions were referenced from a previous study<sup>16</sup>, which used a 5-point Likert scale from "Strongly disagree" to "Strongly agree" with corresponding scores of 1 to 5. For each item, the median score was used to divide positive and negative groups. For condom use self-efficacy, five questions were used to determine the ability to determine condom use with most recent partner, such as "I could use a condom even if my (most recent) partner didn't want us to use one". Regarding self-control self-efficacy, the ability to stop having sex according to different conditions was explored by five questions, e.g., "I could delay sex to get a condom even if I'm really turned on with a new partner". Similarly, sexual

self-efficacy, which is one's commitment to be in control of sexual activities, sexual relationships and condom use, was assessed by using 14 questions, e.g., "I can talk with my partner about past sexual activities and our risk of getting STI/HIV from each other". Moreover, hedonistic outcomes and the pursuit of sexual pleasure by condom use was examined by four questions, such as "Sex doesn't feel as good when I use a condom". Finally, respondents' thoughts about their most recent partner's beliefs on condom use (partner-expected outcomes) were examined by six questions, e.g., "She will think I have other sex partners or STI if I ask to use condoms". Cronbach Alpha values were 0.70 for condom use self-efficacy, 0.89 for self-control self-efficacy, 0.87 for sexual self-efficacy, 0.83 for hedonistic outcomes and 0.89 for partner-expected outcomes.

In order to assess the substance use behavior of male migrants, drug and alcohol use questions were asked. For drug use, type of drug use in last 12 months and drug use before sex were asked. Regarding alcohol use, three questions from the Alcohol Use Disorder Identification Test (AUDIT C) were used, yielding potential scores of 0 to 4 for five options. A total score of more than 4 is considered a hazardous alcohol use for males<sup>17</sup>. In addition, alcohol use before sex was asked to determine the effect of alcohol on condom use.

Data were coded and analyzed by using SPSS version 21. Frequencies and percentages for categorical variables were calculated to describe the distributions of demographic characteristics of the male migrants. For the inferential statistics, the Chi-square test for categorical variables was used to test the association between each independent variable and the depend-

ent variable. Multiple logistic regression was done by backward stepwise method to examine factors associated with condom use. The p value for entry of variable into the model was kept at 0.05 and p value for removal was kept at 0.05. The variables retained in the final model were presented with adjusted odds ratios (Adj OR) and 95% CIs. Statistical significance was set at P value less than 0.05.

## Results

The prevalence of condom use at last sex was 21.2%. Regarding types of partners, the prevalence was 6.8% with a wife or girlfriend, 40.0% with a casual partner, 89.8% with a female sex worker, and no condom among a male sex partner was reported.

The distribution of male migrants by socio-demographic characteristics is shown in Table 1. One-third were age older than 35 years. Regarding occupation, nearly half of the male migrants were laborers and one-fourth were seafarers or self-employed. Nearly one-third of the sample had migrated from the Ayyarwady Region or Mon State and the rest came from the Bago Region or other areas. In the study area, three-fourths of male migrants were continuously resident and the rest were living there intermittently. Nearly half of the male migrants never or rarely went back to their hometown. Most of the migrants were of Myanmar ethnicity and Buddhist. About 80% of male migrants were currently married or living with an intimate partner. Only one-fifth of

male migrants had higher income (>240,000 kyats) and high school or higher education. Table 2 shows that the majority of male migrants (68.1%) had poor access to condoms.

Table 3 describes associations between each independent variable and condom use. A significance level of <0.05 was used. It was found that age group, occupation, place of residence at origin, total length of stay in the study area, currently living with wife/partner, condom accessibility, knowledge about condom and partner-expected outcomes had a statistically significant association with condom use at last sex.

In Table 4, eight variables which had a significant association in the Chi-square test were entered into the multiple logistic regression. The results show that the younger age group (18-24 years) (Adj OR=2.88, 95% CI =1.38-6.01), male migrants from other regions (Adj OR=2.40, 95% CI=1.15-5.01), length of stay less than 1 year (Adj OR=2.40, 95% CI=1.31-4.40), not currently married or living with a partner (Adj OR=5.13, 95% CI =2.85-9.24), condom accessibility [fair (Adj OR=2.42, 95%CI =1.08-5.40) and easy (Adj OR=2.96, 95% CI=1.49-5.89)], poor knowledge about condoms (Adj OR=3.74, 95% CI =1.95-7.15) and positive partner-expected outcomes (Adj OR=2.09, 95% CI =1.19-3.68) were associated with condom use at last sex. The model had a good fit to the data (p value = 0.33).

**Table 1** Distribution of respondents by socio-demographic characteristics and substance use

Socio-demographic factors	Number	Percentage	Mean (SD)
<b>Age groups (years)</b>			30.49 (7.56)
18-24	103	24.5	
25-34	192	45.7	
35-49	125	29.8	
<b>Occupation</b>			
Seafarer	122	29.0	
Labors	183	43.6	
Self-employed	115	27.4	
<b>Place of residence at origin</b>			
Ayyarwaddy	132	31.4	
Bago	75	17.9	
Mon	133	31.7	
Others	80	19.0	
<b>Total length of stay in this place</b>			
≤12 months	90	21.4	
>12 months	330	78.6	
<b>Currently married or living with a partner</b>			
Yes	334	79.5	
No	86	20.5	
<b>Income per month<sup>1)</sup></b>			234,247 (131,650)
lower income (<160000Kyats)	162	38.6	
middle income (160000-240000 kyats)	165	39.3	
higher income (>240000 kyats)	93	22.1	
<b>Education</b>			
No formal education or primary school	162	38.6	
Middle school	165	39.3	
High school or higher	93	22.1	
<b>Substance use behavior</b>			
<b>Hazardous Alcohol use</b>			
Yes	220	52.4	
No	200	47.6	
<b>Alcohol use before sex</b>			
Yes	218	51.9	
No	202	48.1	

<sup>1)</sup> 1 US dollar = approximately 1,400 Kyats

**Table 2** Distribution of respondents by socio-environmental and psychosocial factors

Variables	Number	Percentage	Mean (SD)
<b>Socio-environmental factors</b>			
<b>Condom accessibility</b>			
Poor	286	68.1	
Fair	53	12.6	
Easy	81	19.3	
<b>Peers' social norms on condom use</b>			
Good (>12)	232	55.2	
Poor ( $\leq$ 12)	188	44.8	
<b>Psychosocial factors</b>			
<b>Knowledge about condoms</b>			7.96 (1.27)
Poor ( $\leq$ 4)	271	64.5	
Good (>4)	149	35.5	
<b>Condom use self-efficacy</b>			14.15 (5.02)
Negative ( $\leq$ 14.5)	210	50.0	
Positive (>14.5)	210	50.0	
<b>Self-control self-efficacy</b>			12.11 (5.01)
Negative ( $\leq$ 12)	236	56.2	
Positive (>12)	184	43.8	
<b>Sexual self-efficacy</b>			46.88 (8.26)
Negative ( $\leq$ 47)	222	52.9	
Positive (>47)	198	47.1	
<b>Hedonistic outcomes</b>			8.99 (3.39)
Negative ( $\leq$ 8)	215	51.2	
Positive (>8)	205	48.8	
<b>Partner-expected outcomes</b>			20.74 (6.35)
Negative ( $\leq$ 21)	234	55.7	
Positive Partner (>21)	186	44.3	

**Table 3** The association between each independent variable and condom use at last sex

	Condom use at last sex		P value
	Yes	No	
	n	(%)	
<b>Socio-demographic factors</b>			
<b>Age groups (years)</b>			<b>0.037</b>
18-24	30 (29.1)	73 (70.9)	
25-34	40 (20.8)	152 (79.2)	
35-49	19 (15.2)	106 (84.8)	
<b>Occupation</b>			<b>0.022</b>
Seafarer	36 (29.5)	86 (70.5)	
Labour	30 (16.4)	153 (83.6)	
Self-employment	23 (20.0)	92 (80.0)	
<b>Place of residence at origin</b>			<b>0.029</b>
Ayyarwaddy	26 (19.7)	106 (80.3)	
Bago	20 (26.7)	55 (73.3)	
Mon	19 (14.3)	114 (85.7)	
Others	24 (30.0)	56 (70.0)	
<b>Total length of stay in the study area</b>			<b>0.001</b>
≤12 months	31 (34.4)	59 (65.6)	
>12 months	36 (17.6)	272 (82.4)	
<b>Currently married or living with a partner</b>			<b>&lt;0.001</b>
Yes	52 (15.6)	282 (84.4)	
No	37 (43.0)	49 (57.0)	
<b>Alcohol use before sex</b>			0.327
Yes	26 (18.4)	115 (81.6)	
No	63 (22.6)	216 (77.4)	
<b>Hazardous Alcohol use</b>			0.179
Yes	41 (18.6)	179 (81.4)	
No	48 (24.0)	152 (76.0)	
<b>Socio-environmental factors</b>			
<b>Condom accessibility</b>			<b>0.044</b>
Poor	51 (17.8)	235 (82.2)	
Fair	14 (26.4)	39 (73.6)	
Easy	24 (29.6)	57 (70.4)	
<b>Peers' social norms on condom use</b>			0.161
Good (>12)	34 (18.1)	154 (81.9)	
Poor (≤12)	55 (23.7)	177 (76.3)	
<b>Psychosocial factors</b>			
<b>Knowledge about condoms</b>			<b>0.002</b>
Poor (≤4)	70 (25.8)	201 (74.2)	
Good (>4)	19 (12.8)	130 (87.2)	
<b>Condom use self-efficacy</b>			0.403
Negative (≤14.5)	48 (22.9)	162 (77.1)	
Positive (>14.5)	41 (19.5)	169 (80.5)	
<b>Self-control self-efficacy</b>			0.808
Negative (≤12)	49 (20.8)	187 (79.2)	
Positive (>12)	40 (21.7)	144 (78.3)	
<b>Sexual self-efficacy</b>			0.344
Negative (≤47)	51 (23.0)	171 (77.0)	
Positive (>47)	38 (19.2)	160 (80.8)	
<b>Hedonistic Outcomes</b>			0.709
Negative (≤8)	44 (20.5)	171 (79.5)	
Positive (>8)	45 (22.0)	160 (78.0)	
<b>Partner expected Outcomes</b>			<b>0.039</b>
Negative (≤21)	41 (17.5)	193 (82.5)	
Positive (>21)	48 (25.8)	138 (74.2)	

**Table 4** Multiple logistic regression for condom use at last sex

	Adj OR	(95%CI)	P value
<b>Age groups (years)</b>			
18-24	2.88	(1.38-6.01)	<b>0.005</b>
25-34	1.61	(0.82-3.15)	0.288
35-49	1		
<b>Place of residence at origin</b>			
Ayyarwaddy	1		
Bago	1.54	(0.72-3.30)	0.266
Mon	0.69	(0.32-1.46)	0.327
Others	2.40	(1.15-5.01)	<b>0.020</b>
<b>Total length of stay in this place</b>			
less than 1 year	2.40	(1.31-4.40)	<b>0.005</b>
1 to 5 years	1		
<b>Currently married or living with a partner</b>			
Yes	1		
No	5.13	(2.85-9.24)	<b>&lt;0.001</b>
<b>Condom accessibility</b>			
Poor	1		
Fair	2.42	(1.08-5.40)	<b>0.031</b>
Easy	2.96	(1.49-5.89)	<b>0.002</b>
<b>Knowledge about condoms</b>			
Poor ( $\leq 4$ )	3.74	(1.95-7.15)	<b>&lt;0.001</b>
Good ( $> 4$ )	1		
<b>Partner-expected outcomes</b>			
Negative ( $\leq 21$ )	1		
Positive ( $> 21$ )	2.09	(1.19-3.68)	<b>0.010</b>

Hosmer and Lemeshow Goodness-of-Fit Test = 9.149 (p-value= 0.33)

## Discussion

The Myanmar National Strategic Plan had set a target of 90% condom use at last sex for the priority populations, including migrants<sup>1</sup>. This study found that 21.2% of male migrant workers used a condom at last sex. This result was not that different from a previous study in Nepal which found that 16.3% of males aged 15-49 used a condom at last sex<sup>18</sup>. Factors which associated with condom use at last sex were younger age group (18-24 years), place of residence in other regions, length of stay in the study area for less than 1 year, not currently married or living with a partner, fair and easy access to condoms, poor knowledge about condoms and positive partner-expected outcomes. The findings from this study could help policy makers to detect male migrant workers at risk of HIV infection, and construct intervention plans as a part of HIV prevention.

After adjustment for confounding factors, people in the younger age groups were more likely to use a condom. The result is consistent with study from Nepal that older persons were less likely to use a condom<sup>18</sup>. Older persons were more likely to be married and, thus, less likely to use a condom with their wife, in consistent with our finding. A national survey in Myanmar found that 52 % of currently married women use a contraceptive method, but only 1% use condoms as a contraceptive<sup>19</sup>. In Myanmar, younger married couples might not want to use condoms as HIV prevention since that would also prevent pregnancy, which is a socially-desirable outcome of marriage. Studies from India and Nepal, which have more or less the same culture as Myanmar, found that the low prevalence of condom use among married couples might be due to social pressure, cultural beliefs and holistic health

beliefs which is the belief on interdependent between physical, mental, emotional, and spiritual factors about the transmission of HIV<sup>20</sup>. Conversely, younger, single people may have more non-regular partners. Another study found that condom use was higher with non-regular partners than more steady partners<sup>20</sup>.

Most of the male migrants were Burmese ethnicity and Buddhist. However, ethnicity and religion did not influence condom use. Even though the place of residence at origin was not a significant predictor of condom use, a higher percentage of male migrants from Bago and other regions used condoms more than those from Mon and Ayyarwaddy regions. This might be due to the fact that the background prevalence of condom use in Ayyarwady and Mon regions were 0.3% and 0.5%, which were lower than many other regions<sup>19</sup>.

Previous related studies found that education<sup>13,21</sup> and income<sup>21</sup> were predictors for condom use, but that is inconsistent with the results from this study. Although there were no statistically significant associations between education, income and condom use, other factors may determine use or non-use, such as condom accessibility. The descriptive results showed that more than two-thirds of the male migrant workers had poor access to condoms. That result is consistent with a similar study in Africa that found that barriers for accessibility to condoms can reduce condom use<sup>13</sup>. In sum, having high education and income could not overcome poor accessibility to condoms in determining condom use in the Myanmar setting.

In Myanmar, 22% of males had comprehensive knowledge about modes of transmission and HIV prevention. For example, they knew the two major

ways of preventing the sexual transmission of HIV, and the most common misconceptions about HIV transmission<sup>19</sup>. However, male migrants with good knowledge were less likely to use a condom at last sex which means that, although they have high knowledge, they don't want to use condoms because, usually, their principal sex partner is a wife or girlfriend. This result may also support the fact that the Burmese prefer other kinds of contraceptive methods than condoms.

Although SCT-based potential factors affecting condom use showed significant association with condom use at last sex<sup>16</sup>, only partner-expected outcomes had an association in this study. It is possible that some of the SCT constructs have no influence on condom use among married couples. Also, this study was based on different study populations and study areas. However, one national study from Myanmar revealed that 80% of men think that a woman should ask her partner to use condoms if she knows her partner has an STI<sup>19</sup>. In alignment with that result, this study found that male migrants who have negative partner-expected outcomes were less likely to use condoms out of concern that their partner will think that they have an STI or other sex partner.

A previous study from Myanmar revealed that substance use was associated with risky sex behavior, including condom use<sup>9</sup>. This study found that male migrants who used alcohol before sex and who were considered as hazardous alcohol users were less likely to use condoms at last sex.

This study was designed in cross-sectional and mainly used descriptive and quantitative data so these data cannot fully explain the process of behavior change. Structured questionnaires were adopted from

other studies in which different cultures and study areas. Time of data collection was also limited and some of the migrants went back to their home at the time of data collection.

## **Recommendations**

### ***Recommendation for local health authorities***

This study found that a high percentage of migrant workers had sex without use of condoms. Therefore, voluntary HIV testing and counselling services should be provided before migrants move from one area to another. Similarly, migrants coming from other areas should be provided voluntary testing for HIV and received health education as soon as they arrive. Migrants who live longer duration (more than 1 year) should be registered as long-stay category and checked whether they can access to HIV prevention services. Occupation-based health education/service programs should be provided, tailored to different occupations, and should include health talks, HIV testing services, focus group discussions and condom distribution in the workplace. Health authorities are suggested to provide age specific health program especially for older age group and married male migrants. For married couples, condom promotion should be implemented by front-line health staffs like midwives and auxiliary midwives. Health services given by basic health staff should encourage condom use as promoting family health, not only as a contraceptive or disease-prevention measure.

Even though many migrants may have good knowledge towards condom use, there might be some misbelieve or misunderstanding on condom use. Therefore, health education programs should be emphasized on comprehensive health knowledge

towards HIV and self-efficacies towards condom use. Condom distribution services should be expanded, mainly for migrant clusters, working sites and via health centers. Condoms should be pre-provided to every migrant worker in order to available every time and free of charges. Finally, although addictive substance use was not a predictor of condom use, this study found that the prevalence of substance abuse was still high among migrant workers. This may have an indirect effect on elevated risk of STI, such as engaging in commercial sex. Therefore, substance abuse should be limited by local authorities in coordination with INGOs, NGOs and rehabilitating services.

#### ***Recommendation for further studies***

Further study should be emphasized on qualitative approach to explore more reasons and details about condom use at last sex as well as consistent use of condom. In addition, the characteristic of local workers should be compared with migrant workers in order to find the differences between two population groups.

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