Journal of Public Health and Development
Vol. 16 No. 3 September-December 2018

ORIGINAL ARTICLE

Determinants of condom use at last sex among adult HIV patients on antiretroviral treatment in Mandalay City, Myanmar

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Received: *26 August 2018* ***Revised:*** *29 November 2018* ***Accepted:*** *12 December 2018*
Available online: *December 2018*

Abstract

Oo ZZ, Chompikul J and Thepthien B. Determinants of condom use at last sex among adult HIV patients on antiretroviral treatment in Mandalay City, Myanmar. J Pub Health Dev. 2018;16(3):67-80

This hospital based cross-sectional study aimed at determining the prevalence of condom use at last sex within 12 months, and associated factors among HIV patients on antiretroviral treatment (ART) in Mandalay city, Myanmar. The two-stage cluster sampling was used to draw a sample. The data collection was conducted in April 2018. A total of 442 HIV positive patients aged 18 years and older on ART who followed up at the Integrated HIV Care (IHC) clinics in Mandalay City were face to face interviewed using a structured questionnaire. Chi-square test and multiple logistic regression were used to examine associations between independent variables and condom use at last sex.

This study revealed 79.6% of HIV positive patients used condom at last sex. Overall, 56.3% were male. Mean age was 39.58 years with standard deviation of 7.99. Nearly 32.6% were having own business and 33.3% graduated higher more than high school level. Only 13.1% were currently living as a single. In Chi-square test, gender, employment status, marital status, self-efficacy to use condom, disclosure of HIV status, fertility desire in the last 12 months and HIV status of regular partner were significantly associated with last sex condom use. In multiple logistic regression, male HIV patients (Adj OR=1.88, 95% CI=1.09-3.23), being married/cohabiting (Adj OR=5.10, 95% CI=2.00-12.98), having high self-efficacy to use condom (Adj OR=3.32, 95% CI=1.81-6.10) and no fertility desire (Adj OR=4.23, 95% CI=2.19- 8.16) were more likely to use condom at last sex when controlling for gender, education levels and HIV knowledge levels about transmission and prevention.

Couple counselling about conception and specific activities for increasing self-efficacy to use condom for HIV positive patients should be promoted to improve effectiveness of HIV prevention program.

Keywords: last sex, condom use, people living with HIV, Myanmar

วารสารสาธารณสุขและการพัฒนา
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ปัจจัยที่มีผลต่อการใช้ถุงยางอนามัยในการมีเพศสัมพันธ์ครั้งล่าสุดของผู้ป่วยที่ติดเชื้อเอชไอวีที่เป็นผู้ใหญ่ซึ่งมารับการรักษาด้วยยาต้านไวรัสในเมืองมัณฑะเลย์ ประเทศพม่า

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บทคัดย่อ

ซอ ซอ อู จิราพร ชมพิกุล และบังอร เทพเทียน ปัจจัยที่มีผลต่อการใช้ถุงยางอนามัยในการมีเพศสัมพันธ์ครั้งล่าสุดของผู้ป่วยที่ติดเชื้อเอชไอวีที่เป็นผู้ใหญ่ซึ่งมารับการรักษาด้วยยาต้านไวรัสในเมืองมัณฑะเลย์ ประเทศพม่า ว. สาธารณสุขและการพัฒนา 2561;16(3):67-80

การศึกษาแบบภาคตัดขวางโดยใช้โรงพยาบาลเป็นฐานในการเก็บข้อมูลนี้มีวัตถุประสงค์เพื่อศึกษาความชุกของการใช้ถุงยางอนามัยในการมีเพศสัมพันธ์ครั้งล่าสุดภายใน 12 เดือนและปัจจัยที่เกี่ยวข้องในผู้ป่วยเอชไอวีที่มารับการรักษาด้วยยาต้านไวรัสในเมืองมัณฑะเลย์ ประเทศพม่า ตัวอย่างในการศึกษานี้ได้ถูกสุ่มมาโดยใช้การสุ่มตัวอย่างกลุ่มแบบสองขั้นตอน การเก็บรวบรวมข้อมูลได้ดำเนินการในช่วงเดือนเมษายน พ. ศ. 2561 ผู้ป่วยที่ติดเชื้อเอชไอวีทั้งหมด 442 คนซึ่งมีอายุ 18 ปีขึ้นไปที่มารับการรักษาที่คลินิกบูรณาการการดูแลรักษาผู้ติดเชื้อเอชไอวีในเมืองมัณฑะเลย์ได้รับการสัมภาษณ์โดยใช้แบบสอบถามที่มีโครงสร้าง การทดสอบไคสแควร์และการถดถอยลอจิสติคพหุคูณถูกนำมาใช้เพื่อทดสอบความสัมพันธ์ระหว่างตัวแปรอิสระและการใช้ถุงยางอนามัยในเพศสัมพันธ์ครั้งล่าสุด

การศึกษาครั้งนี้พบว่า 79.6% ของผู้ติดเชื้อเอชไอวีที่ใช้ถุงยางอนามัยในการมีเพศสัมพันธ์ครั้งล่าสุดภายใน 12 เดือน โดยส่วนใหญ่ 56.3% เป็นชาย อายุเฉลี่ย 39.58 ปีส่วนเบี่ยงเบนมาตรฐาน 7.99 เกือบ 32.6% มีธุรกิจส่วนตัวและ 33.3% จบการศึกษาระดับมัธยมศึกษาตอนปลาย มีเพียง 13.1% ที่เป็นโสด ผลการทดสอบไคสแควร์พบว่า เพศ สถานะการจ้างงาน สถานภาพการสมรส ความสามารถของตนเองในการใช้ถุงยางอนามัย การเปิดเผยสถานะเอชไอวี ความต้องการในการมีบุตรในช่วง 12 เดือนที่ผ่านมา และภาวะติดเชื้อเอชไอวีของคู่รักปกติ มีความสัมพันธ์กับการใช้ถุงยางอนามัยครั้งล่าสุดอย่างมีนัยสำคัญ ผลการวิเคราะห์ด้วยการถดถอยลอจิสติคพหุคูณ พบว่าผู้ป่วยเอชไอวีชาย (Adj OR = 1.88, 95% CI = 1.09-3.23) ผู้ที่แต่งงาน/อยู่ร่วม (Adj OR = 5.10, 95% CI = 2.00-12.98) ความสามารถของตนเองในการใช้ถุงยางอนามัยสูง (Adj OR = 3.32, 95% CI = 1.81-6.10) และไม่มีความต้องการมีบุตร (Adj OR = 4.23, 95% CI = 2.19- 8.16) มีแนวโน้มที่จะใช้ถุงยางอนามัยในการมีเพศสัมพันธ์ครั้งล่าสุดโดยควบคุมอิทธิพลของเพศ ระดับการศึกษาและระดับความรู้เกี่ยวกับการติดเชื้อเอชไอวีและการป้องกัน

การให้คำแนะนำแก่คู่รักเกี่ยวกับการตั้งครรภ์และกิจกรรมเฉพาะเพื่อเพิ่มความสามารถของตนเองในการใช้ถุงยางอนามัยสำหรับผู้ป่วยติดเชื้อเอชไอวีควรได้รับการส่งเสริมเพื่อปรับปรุงประสิทธิผลของโครงการป้องกันการติดเชื้อเอชไอวี

คำสำคัญ: การมีเพศสัมพันธ์ครั้งล่าสุด การใช้ถุงยางอนามัย ผู้ติดเชื้อเอชไอวี ประเทศพม่า

Introduction

Epidemic of human immunodeficiency virus (HIV) remains a major health problem in public health globally. More than 35 million people are living with HIV in 2017[1]. At the end of 2017, 36.9 million people are suffering from HIV infection in which HIV-related causes of deaths has 940,000 people globally. It was estimated that around 1.8 million were becoming newly infected people in 2017 globally[1]. In Myanmar, 230,000 people are living with HIV/AIDS (PLWHA) and 7800 patients were died from HIV related causes which fell by an estimated 52% from 2010 to 2016[2]. There were an estimated 11,000 new infected cases in 2016 according to epidemic modelling, it means that approximately 30 people were newly infected per day. According to UNAIDS report Myanmar, the number of people living with HIV were second highest in the Southeast Asia region[2].

Although there are beneficial clinical effects of ART, treatment advances may have an accompanied increase in sexual activity[3]. The risk of other STI and HIV transmission is low if there is only sustained viral suppression is confirmed and very closely monitored[4]. However, people living on HIV treatment and sero-discordant couples are strongly recommended to use condom by a study of systemic review and Meta-Analysis[5]. Therefore, condom use is continuously essential as a complement to other HIV prevention methods such as ART initiation, PrEP and others in particular when STIs and unintended pregnancy are of concerns[6].

In Myanmar, progress report 2015 National AIDS Program reported that condom use at last sex among female sex workers was 81.1%, people living with inject drug was 22.9% and men who has sex with men was 77.1% in 2015[7]. Data about condom use at last sex among people living with HIV in Myanmar are limited.

Many studies found that consistent condom use decreased the chance of getting HIV infection[8-10] and condoms have effectiveness of 80–95% reduction in HIV transmission rates when used correctly and consistently. Therefore, it was a key factor to prevent HIV globally. It is difficult to define the correct prevalence of condom use in all regions since studies different in the way of assessment tool, variety of contextual factors, psychosocial and intrapersonal reasons.

In Myanmar, there is a need for understanding the risky sexual practice, attitudes and self-efficacy of condom use among HIV positive people. Since PLWHA are sources of infection and if they maintain safe sex, new infection from known HIV infected persons would be reduced. Mostly, newly HIV infected persons are transmitted through sexual intercourse without using condom worldwide.

Therefore, this study aimed at describing the prevalence of condom use at last sex and associated factors among HIV infected patients. It would provide evidence-based information to policy makers, program planners and health service providers on the problem which is subsequently essential to design and implement appropriate interventions and behavioral change communication.

Methods

The study was conducted at Integrated HIV Care (IHC) clinics[11] of Mandalay General Hospital and seven Townships in Mandalay District, Myanmar. Mandalay City is situated in the central of Myanmar.

Mandalay city is composed of seven townships. The population of Mandalay was 1,726,889 in both sex, and the male to female ratio was 95.1 in 2014[12]. Health literacy in overall 15 years and over was 96.3%.

The data were collected from the hospital based cross-sectional study design using a structured questionnaire to identify the prevalence of consistent condom use. This study aimed at determining the association between socio-demographic factor, social cognitive factor, knowledge about HIV/AIDS regarding condom use, socio-environmental factors and condom use at last sex among adults (over 18 year) HIV infected patients.

The target population was HIV positive patients aged 18 years and older among on ART who followed up at the IHC clinics during the study period in Mandalay City, Myanmar. The patients were excluded if they had difficulty in communication according to physically or clinically ill and no active sexual intercourse.

Sampling technique

The sample size was estimated using a confidence interval of 95%, an acceptance error of 5%, and a proportion of using condom among HIV patients of 0.48 in a previous study[13]. Thus, the required sample size was at least 442. The two-stage cluster sampling (Figure 1) was used to draw a sample. Five out of 9 clinics were selected by simple random sampling. Number of sample size for each selected clinic were calculated by proportional to size of the population. Systematic sampling was used to randomly select the participants from each clinic. A total of 442 HIV positive patients were recruited in this study.

Research Instruments

The research instrument tools included a questionnaire containing questions on background characteristics of respondents (6 items), fertility desire (5 items), HIV/AIDS knowledge (18 items) and alcohol use before sex (1 item), partnership characteristics (3 items), HIV disclosure (6 items), Self-efficacy to use condom (14 items).

Condom use at last sex was defined as when the patients had sexual activity within 12 months, using any types of condom including female condom in any sexual partner at last sex.

HIV-KQ-18 questions measurement[14] was used to measure HIV knowledge about transmission and prevention. It can be applied on any clinical setting and low educational level of respondents. The final value of KR-20 for knowledge scale (16 items) was 0.79 after dropping the questions that were too easy or difficult in the pre-test. The knowledge was classified into 3 levels using Bloom's criteria as the cut of point. If score was > 80 %, it was classified to high level, 60% - 80% was moderate level and < 60% was low level.

Kalichman and his colleagues had developed HIV disclosure scale and self-efficacy scale for safer sex[15-16]. It was four-point Likert scale measurement and consisted of 5 items. In the pre-test, the reliability coefficient (Cronbach's alpha) of HIV status disclosure was 0.85.

Self-efficacy to use condom have 14 items and all positive statement with five-point Likert scale type (1= very unsure to 5 = very sure). The answers of the questions were no right or wrong. It contains three domains: five questions for communication self-efficacy related to condom use, three questions for

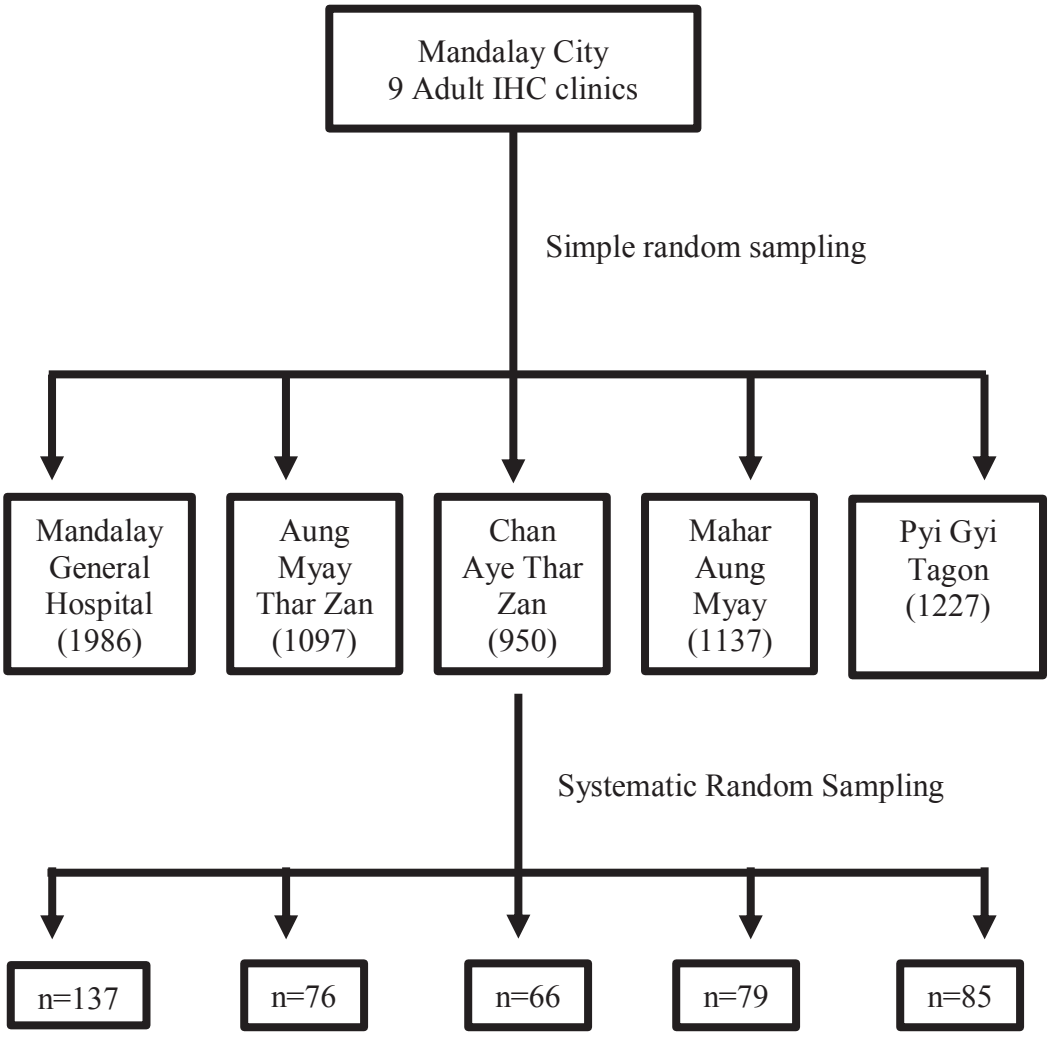

Figure 1 Diagram for two-stage cluster sampling

ability of consistent condom use and six questions are asking about correct use self-efficacy. The Cronbach's alpha of acceptable internal consistency for the subscales were 0.72 to 0.78 and total scale was 0.85[17]. In this research, the Cronbach's alpha coefficient of self-efficacy was 0.77. The respondents had high self-efficacy to use condom meant the respondents' score was higher than the median of total score and those had the score below median was defined as low self-efficacy to use condom.

Data analysis

All data were analyzed by using SPSS software version 20. Descriptive statistics (mean, median, standard deviation, quartile deviation, range, and percentage) were used to describe the independent and dependent variables. Chi-square test was used to determine the association between last sex condom use and each independent variable. Multiple logistic regression using backward (wald) method was performed to determine predictors of condom use at last sex.

Ethical consideration

The research protocol was submitted before data collection to the Ethics Committee for Research Ethics (Social Sciences), Faculty of Social Sciences and Humanities, Mahidol University Institutional Review Board (MU-SSIRB) The Certificate of Approval Number was MU-SSIRB 2018/038.2702. The research proposal was submitted to National AIDS Program under Ministry of Health and Sports, Myanmar. A formal permission was also obtained from the Ethic Reviews Committee at Ministry of Health and Sports, Myanmar.

Results

Over all, a total of 442 HIV positive patients, 56.3% were male. Mean age was 39.58 years with standard deviation (SD) of 7.99. Nearly 32.6% were having own business and 33.3% graduated higher than high school level. Only 13.1% were living as a single. Seventy-one percent had never used alcohol, while 13.8% always used alcohol before sex. Almost half of the respondents (49.5%) had HIV positive partners. The study revealed 79.6% had use condom at last sex. The details of socio-demographic characteristics are shown in Table 1. The percentage of the low level and high level of knowledge among HIV positive patients were nearly the same accounting for 30.1% and 31% while 38.9% were in the moderate level of knowledge about HIV transmission, prevention and adverse effect of HIV infection (Table 2).

Table 3 presents that male HIV positive patients were 1.73 times more likely to use condom at last sex than females (OR=1.73, 95% CI=1.08-2.75). The HIV patients who had own business were 1.77 times more likely to use condom at last sex than those being housewives/dependents/daily workers (OR=1.77, 95% CI=1.05-3.00). But single HIV patients were 0.27 times less likely to use condom than married patients (OR=0.27, 95% CI=0.15-0.48). Statistically, there was no association between condom use at last sex and some variables including age group, education levels, alcohol use before sex, knowledge about HIV.

The HIV positive patients who had high level of self-efficacy to use condom were 3.79 times more likely to use condom at last sex than those having low self-efficacy (OR=3.79, 95% CI=2.21-6.50). Moreover, HIV patients being high level of disclosure about HIV status were 2.32 times more likely use condom at last

Table 1 Distribution of respondents by socio-demographic factors

Socio-demographic factors	Number	Percent
Gender		
Males	249	56.3
Females	193	43.7
Age groups (years)		
20-29	47	10.6
30-39	175	39.6
40-49	172	38.9
≥50	48	10.9
Mean=39.58, SD=7.99, Min=20, Max=62		
Education levels		
Illiterate	11	2.5
Primary School	113	25.6
Middle School	171	38.7
High School	92	20.8
University/College	37	8.4
Bachelor	18	4.1
Employment status		
Government Service	21	4.8
Private Service	33	7.5
Own Business	144	32.6
Daily worker	123	27.8
Agriculture	24	5.4
Housewife/dependent	97	21.9
Marital status		
Single	31	7.0
Married	379	85.7
Cohabiting	5	1.1
Separate/Divorced	12	2.7
Widowed	15	3.4
Condom use at last sex		
Yes	352	79.6
No	90	20.4

Table 2 Number and percentage of respondents by independent variables

Variables	Number	Percent
Disclosure of HIV status levels		
Low (≤11)	223	50.5
High (>11)	219	49.5
Median=11, QD=2.5, Min=5, Max=20		
Self-efficacy levels to use condom		
Low (≤ 52)	239	54.1
High (> 52)	203	45.9
Median=52, QD=6.5, Min=14, Max=70		
Alcohol use before sex		
Never	314	71.0
Sometime	67	15.2
Always	61	13.8
Knowledge levels		
Low (≤ 9)	133	30.1
Moderate (10 - 12)	172	38.9
High (≥ 13)	137	31.0
Regular partner's HIV status		
HIV Positive	219	49.5
HIV Negative	160	36.2
Unknown sero status	63	14.3
Having fertility desire in last 12 months		
Yes	59	13.3
No	343	77.6
No response	40	9.0

sex than those of low level of disclosure (OR=2.32, 95% CI=1.43-3.77). HIV status of regular partner was significantly associated with condom use at last sex. The HIV patients who had unknown sero-status partners were 0.53 times less likely to use condom at last sex (OR=0.53, 95% CI= 0.29-0.99) than those with HIV positive status (Table 3).

To determine the predictors of the outcome, six associated variables were selected to conduct multiple logistic regressions (Table 4) by controlling gender, education levels, and marital status. The final significant predictors for condom use at last sex in this study were self-efficacy for condom use, fertility desire, marital status and gender. After adjusting for other factors in the logistic regression model, HIV positive

Table 3 Association between each independent variable and condom use at last sex

Variables	Last sex condom use			Crude OR	95% CI	p-value
	n	Yes (%)	No (%)			
Gender						
Females	193	74.6	25.4	1		
Males	249	83.5	16.5	1.73	1.08 - 2.75	**0.022**
Employment status						
Housewives/dependents/	220	76.4	23.6	1		
daily workers	54	75.9	24.1	0.98	0.49 - 1.96	0.946
Salary person	168	85.1	14.9	1.77	1.05 - 3.00	**0.033**
Own business						
Marital status						
Married/cohabiting	384	83.1	16.9	1		
Single/Separate/Divorced/	58	56.9	43.1	0.27	0.15 - 0.48	**<.001**
Widowed						
Education levels						
Middle school and lower	295	78.6	21.4	0.83	0.05 - 1.37	0.462
High school and above	147	81.6	18.4	1		
Disclosure of HIV status levels						
Low (≤11)	223	73.1	26.9	1		
High (>11)	219	86.3	13.7	2.32	1.43 - 3.77	**0.001**
Self-efficacy levels to use condom						
Low (≤ 52)	239	70.7	29.3	1		
High (> 52)	203	90.1	9.9	3.79	2.21 - 6.50	**<.001**
Knowledge levels						
Low (≤ 9)	133	78.2	21.8	1		
Moderate (10 - 12)	172	83.1	16.9	1.38	0.78 - 2.44	0.276
High (≥ 13)	137	76.6	23.4	0.92	0.52 - 1.62	0.760
Regular partner's HIV status						
HIV positive	219	79.0	21.0	1		
HIV negative	160	85.6	14.4	1.58	0.92 - 2.74	0.100
Unknown sero-status	63	66.7	33.3	0.53	0.29 - 0.99	**0.045**
Having fertility desire in last 12 months						
No	343	84.0	16.0	1		
Yes	59	62.7	37.3	0.32	0.18 - 0.59	**<.001**

Table 4 Multiple logistic regression for predictors of condom use at last sex

Variables	Adj OR	95% C.I. for Adj OR		P value
		Lower	Upper	
Gender				
Males	1.88	1.09	3.23	**0.023**
Females	1			
Marital status				
Single/Separate/Divorced/Widowed	1			
Married/cohabiting	5.10	2.00	12.98	**0.001**
Education levels				
Middle school and lower	0.79	0.43	1.47	0.459
High school and above	1			
Knowledge levels				
High	0.83	0.42	1.65	0.597
Moderate	1.37	0.71	2.64	0.349
Low	1			
Self-efficacy levels to use condom				
High	3.32	1.81	6.10	**<.001**
Low	1			
Fertility desire in last 12 months				
No	4.23	2.19	8.16	**<.001**
Yes	1			

patients who had high self-efficacy were 3.32 times more likely to use condom than those having low self-efficacy (Adj OR=3.32; 95% CI=1.81-6.10).

Discussion

Research findings revealed that 79.6% of HIV positive patients were used condom at last sex. There was association between high disclosure of HIV status and condom use at last sex. High self-efficacy to use condom and fertility desire were the significant predictors for condom use at last sex in HIV positive patients. In contrast, educational attainment and knowledge about HIV transmission, prevention and adverse effect on HIV infection were not significantly associated with condom use at last sex.

In this study, the percentage of condom use at last sex was 79.6%. In Myanmar, 100% Targeted Condom Promotion (100% TCP) program has been

implemented since early 2001[18] and almost all organizations which were working for HIV response program were participated in free condom distribution and their distribution were extended to multiple sites[7]. Since, the study was conducted at service-based area, over estimation of condom use prevalence can occurred. Being participants were regularly followed up and getting well knowledge about HIV infection might be increased condom use at last sex. But it still needed to focus awareness and practice of condom use among HIV positive patients.

The study found that male patients were more likely to use condom than that of female. This result consistent with studies from Uganda[19-20]. According to biological differences between sex, people's role, responsibilities and feelings are controlled by their living environment, culture or society. Women had less ability to negotiate the condom use and little percentage to make a decision use or not use condom during sexual intercourse[21]. Some preventive program for HIV transmission prevention needed to identify the specific sex group.

In this study, HIV patients who reported not being married or live as a single were less likely to use condom at last sex compared with those who were married. This result was inconsistent with the study from Uganda and Ethiopia[22-23]. This result might be currently live as single patients had multiple sexual partners and they were more likely to have more sexual activities. Moreover, married people might overestimate about condom use at last sex to please the interviewers since sex and sex related issues were very sensitive to disclose to other people in Myanmar.

In Myanmar, since the prevention of mother to child transmission of HIV services are now available in many public health sectors and the improved community understanding of the high probability of getting an HIV free child, the couple who have desired to get a child might lead to the avoidance of the condom. In addition, individuals who have no children are usually younger and relatively sexually hyperactive. Thus, they are prone to engage in risky sexual practices. This study also revealed that fertility desire was one of the significant predictors for condom use at last sex in this study. The result of this research supported previous study in Uganda[22] that no fertility desire was more likely to consistently use condom. The majority (77.6%) did not have fertility desire and only 13.3% had fertility desire in near future. This result was 4 times lower than the result from Ethiopia study[24].

Self-efficacy to use condom was also significant predictor in this research. This result was consistent with other studies[25-26]. It was supported that human's belief in their ability to create or remove of action when the people are needed to adapt with prospective situations[27-28]. Condom use self-efficacy is very important to change the behavior toward safe sex during sexual encounter. Lack of knowledge for preventive behavior from HIV transmission, no power for condom used negotiation between sexual partner and reduce the sexual pleasure are the main barrier for reduction of condom used self-efficacy.

This research was conducted in regular follow up patients at Mandalay city. Thus, this study did not include some patients who were loss to follow up and ill patients. Therefore, generalizability of this result was limited, since out study covered only for regular HIV positive patients from Mandalay City not the whole PLWHA in the country. This study could

not find out causality between independent variables and condom use at last sex as it is the cross-sectional survey

Recommendations

The study provides the evidence of condom use at last sex among adult HIV patients on antiretroviral therapy in Mandalay, Myanmar. Based on the findings, the study provided that there is a need for HIV and reproductive health programs to improve communication between providers and patients. Comprehensive counselling for sero-discordant couples were recommended. And also, prevention program should equally focus on the practice and knowledge of condom use in both HIV negative people of high-risk population and HIV infected patients. It is recommended to explore the fertility desire among HIV positive couples using qualitative approach to understand the details about expectations, perceptions, sexual behavior, and practices of safer sex among PLWHA.

Acknowledgements

The authors would like to express our gratitude to all HIV positive patients who participated in the study, and research assistants in Mandalay City for supporting the data collection. I would like to express my special thanks to the ASEAN Institute for Health Development for the financial support (Type IV international scholarship) to my study in Thailand.

References

1. World Health Organization. HIV/AIDS Fact Sheet: World Health Organization; 2017 [Cited 2018 July 28]. Available from: http://www.who.int/mediacentre/factsheets/fs360/en/.
2. Joint United Nations Programme on HIV/AIDS (UNAIDS). UNAIDS Global AIDS Update 2017 Data Book. UNAIDS, editor. Geneva, Switzerland: Joint United Nations Programme on HIV/AIDS (UNAIDS); 2017.
3. Crepaz N, Marks G. Towards an understanding of sexual risk behavior in people living with HIV: a review of social, psychological, and medical findings. AIDS. 2002;16(2):135-49.
4. Marks G, Gardner LI, Rose CE, Zinski A, Moore RD, Holman S, et al. Time above 1500 copies: a viral load measure for assessing transmission risk of HIV-positive patients in care. AIDS. 2015;29(8):947-54.
5. Liu H, Su Y, Zhu L, Xing J, Wu J, et al. Effectiveness of ART and Condom Use for Prevention of Sexual HIV Transmission in Serodiscordant Couples: A Systematic Review and Meta-Analysis. PLoS One. 2014;9(11):e111175.
6. Koff A, Goldberg C, Ogbuagu O. Condomless sex and HIV transmission among serodifferent couples: current evidence and recommendations. Ann Med. 2017;49(6): 534-44.
7. Ministry of Health and Sports Myanmar. Progress Report 2015_National AIDS Program. Nay Pyi Taw, Myanmar: Department of Public Health; 2015.
8. Smith DK, Herbst JH, Zhang X, Rose CE. Condom effectiveness for HIV prevention by consistency of use among men who have sex with men in the

United States. J Acquir Immune Defic Syndr. 2015;68(3):337-44.

9. Ramjee G, Abbai NS, Naidoo S. Women and Sexually Transmitted Infections in Africa. Open J Obstet Gynecol. 2015;5(7):385-99.
10. Mansergh G, Herbst JH, Mimiaga MJ, Holman J. Preference for Condoms, Antiretroviral Preexposure Prophylaxis, or Both Methods to Reduce Risk for HIV Acquisition Among Uninfected US Black and Latino MSM. J Acquir Immune Defic Syndr. 2015;70(4):e153-5.
11. The Union. The Union Office in Myanmar, Fact Sheet [Cited 2017 November 10] Available from: https://www.theunion.org/where-we-work/south-east-asia/body/Myanmar_ Factsheet.pdf.
12. Ministry of Immigration and Population. The 2014 Myanmar Population and Housing Census Department of Population, Ministry of Immigration and Population 2014 [Cited 2017 October 10]. Available from: http://themimu.info/census-data.
13. Nyi Nyi Htay, Wantana Maneesriwongul, Rutja Phuphaibul, Orathai P. A Causal Model of Condom Use among People Living with HIV/AIDS in Myanmar. Pacific Rim International Journal of Nursing Research. 2013;17(3):234-48.
14. Carey MP, Schroder KEE. Development and Psychometric Evaluation of the Brief HIV Knowledge Questionnaire. AIDS Educ Prev. 2002;14(2):172-82.
15. Kalichman SC, Rompa D, DiFonzo K, Simpson D, Kyomugisha F, Austin J, et al. Initial Development of Scales to Assess Self-Efficacy for Disclosing HIV Status and Negotiating Safer Sex in HIV-Positive Persons. AIDS and Behavior. 2001;5(3):291-6.
16. Kalichman SC, Rompa D, Cage M, DiFonzo K, Simpson D, Austin J, et al. Effectiveness of an intervention to reduce HIV transmission risks in HIV-positive people. Am J Prev Med. 2001;21(2):84-92.
17. Hanna KM. An adolescent and young adult condom self-efficacy scale. J Pediatr Nurs. 1999;14(1):59-66.
18. Myanmar National AIDS Programme. Documenting the Progress of the 100% Targeted Condom Promotion Programme in Myanmar. Yangon, Myanmar: Department of Health, Ministry of Health; 2004.
19. Wagner GJ, Ghosh-Dastidar B, Slaughter ME, Akena D, Nakasujja N, Musisi S. Changes in condom use during the first year of HIV treatment in Uganda and the relationship to depression. Ann Behav Med. 2014;48(2):175-83.
20. Walusaga HA, Kyohangirwe R, Wagner GJ. Gender differences in determinants of condom use among HIV clients in Uganda. AIDS Patient Care STDS. 2012;26 (11):694-9.
21. Ngure K, Mugo N, Celum C, Baeten JM, Morris M, Olungah O, et al. A Qualitative Study of Barriers to Consistent Condom Use among HIV-1 Serodiscordant Couples in Kenya. AIDS Care. 2012;24(4):509-16.
22. Ayiga N. Rates and predictors of consistent condom-use by people living with HIV/AIDS on antiretroviral treatment in Uganda. J Health Popul Nutr. 2012;30(3):270-80.
23. Molla AA, Gelagay AA. Risky sexual practice and associated factors among HIV positive adults attending anti-retroviral treatment clinic at Gondar

University Referral Hospital, Northwest Ethiopia. PloS One. 2017;12(3):e0174267.

24. Mmbaga EJ, Leyna GH, Ezekiel MJ, Kakoko DC. Fertility desire and intention of people living with HIV/AIDS in Tanzania: a call for restructuring care and treatment services. BMC Public Health. 2013;13:86. doi: 10.1186/1471-2458-13-86
25. Schutz M, Godin G, Kok G, Vézina-Im LA, Naccache H, Otis J, et al. Determinants of condom use among HIV-positive men who have sex with men. Int J STD AIDS. 2011; 22(7):391-7.
26. Eggers SM, Aaro LE, Bos AE, Mathews C, Kaaya SF, Onya H, et al. Sociocognitive Predictors of Condom Use and Intentions Among Adolescents in Three Sub-Saharan Sites. Arch Sex Behav. 2016;45(2):353-65.
27. Bandura A. Social foundations of thought and action: a social cognitive theory. Englewood Cliffs, New Jersy: Prentice-Hall, Inc; 1986.
28. Bandura A. Self-efficacy: The exercise of control. New York: Worth Publishers; 1997.