

Factors Influencing Inconsistent Condom Use in Thai HIV-Infected Heterosexual Couples

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Objective: To demonstrate the factors why Thai human immunodeficiency virus (HIV)-infected heterosexual couples choose to use, or not to use, condoms.

Materials and Methods: At the Siriraj Female sexually transmitted diseases (STDs) Clinic, HIV-infected women who had two or more visits between February 2016 and December 2017 were invited to participate in a qualitative study. To participate, both the man and woman must be 18 years or older; having regular sexual relations during the previous six months, and be aware of their partner's serostatus. Twenty couples that reported 100% condom use and 20 couples reporting less than 100% condom use were included. Each couple was interviewed together and individually. Sociodemographic characteristics, reasons behind condom use, and perceptions regarding condom use were compared.

Results: On average, the HIV-infected women were 35 years old and their partners were two years older. Each woman reported having one current partner. Of them, 35% (14/40) were serodiscordant and 70% (28/40) had children during the relationship. Women with inconsistent condom use reported less frequent sexual activity, a longer time since HIV diagnosis, and were more likely to have an HIV-seropositive partner ($p < 0.05$ for all). Both women and men reported that the most common reason for inconsistent condom use was 'unavailability or inadequate effort to find one'. The second most common reason women reported was 'partner's rejection' while male partners stated 'less sexual sensation' followed by 'feeling not natural'.

Conclusion: Unavailability is the most commonly reported reason for inconsistent condom use in Thai HIV-infected women and their partners. Male partners' concern about reduced sexual sensation and their rejection of condom use strongly influences protective behaviors.

Keywords: Condom use, Human immunodeficiency virus, Reason, Thai HIV-infected couples

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Male condom use reduces transmission of human immunodeficiency virus (HIV) infection in Asian serodiscordant couples⁽¹⁾ regardless of anti-retroviral treatment (ART)⁽²⁾. The '100% condom' campaign launched in Thailand in 1992 has been one of the most successful projects to control the HIV epidemic in Thailand⁽³⁾. However, as ART has enabled

HIV-infected people to enjoy a better quality of life and longer life expectancy, many have failed to use condoms consistently. In other countries, inconsistent condom use (ICU) ranging from 23% to 84% has become very common^(4,9). From the authors' experience, only 33.6% of HIV-infected women reported consistent condom use (CCU) at their initial visit to the authors' clinic. Like a meta-analysis in Asian population that any HIV prevention interventions can increase condom use⁽¹⁰⁾, the authors' educational sessions increase condom use up to 70%⁽¹¹⁾.

Although condomless relationship among HIV-infected people with undetectable viral load is acceptable, in some regions of the world like Thailand where 22.9% and 17.7% of HIV-infected partners had a prior history of treatment failure and acquired

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immune deficiency syndrome (AIDS)-defining illnesses⁽¹²⁾, CCU remains mandatory. A meta-analysis showed that condom use reduced HIV sexual transmission rate, to 70%^(1,13). The figure was up to 94% when the HIV-infected ones are Asian men⁽¹⁾. In terms of HIV prevention, condom use is superior to anti-retroviral drugs (ARV)⁽¹³⁾ and both modalities had additive effects to one another.

Common obstacles to CCU in this population include the male partner being reluctant to use⁽¹⁴⁾, poor negotiation skills of female partners⁽¹⁴⁾, misconceptions about HIV infection⁽¹⁴⁾, desire for pregnancy^(8,14), alcohol consumption^(8,9,15), and failure to disclose serostatus^(5,7,8). A study in African people showed that, compared with men, HIV-infected women were less likely to disclose their serostatus and to know their sexual partners' serostatus⁽⁸⁾. At the authors' clinic, 61.5% of HIV-infected women disclosed their serostatus to their husbands⁽¹⁶⁾ and mutual trust was the only significant associating factor of the disclosure⁽¹⁶⁾. Despite the importance, data on condom use in Thai HIV-infected women are limited. Moreover, in-depth interviews of both partners can offer greater insight into factors that influence the decision to consistently use condoms. The present study aims to identify and describe factors influencing the decision to use condoms in Thai HIV-infected couples that have disclosed their serostatus to their partners.

Materials and Methods

The present study was conducted in the Unit of Gynecologic Infectious Diseases and Female Sexually Transmitted Diseases, Siriraj Hospital between February 2016 and December 2017. Ethical approval was obtained from the Siriraj Institutional Review Board, Mahidol University (COA no. Si669/2015).

Participants

Eligible participants included HIV-infected women and their male partners regardless of serostatus. To be included, both partners must be at least 18 years of age and engaging in sexual relations during the previous six months. Further, both partners must have been aware of each other's HIV serostatus and not currently have any opportunistic infection(s). The couples who could not read or understand Thai language or who had visited the clinic fewer than two times or who were not able to both be physically present for the interview were excluded.

As previously reported⁽¹⁷⁾, at the authors' clinic, all HIV-infected women are invited to have Pap

testing and sexual health education every six months for seven times. If all tests are negative, then an annual visit is suggested. The authors reviewed how to use condom in every visit. Therefore, almost all of these patients are familiar with the medical personnel in the clinic. Each patient typically receives a reminder phone call a few days prior to her next scheduled appointment. To conduct the present study, the authors asked if their partners could accompany them to the clinic.

Study process

Group "A" included 20 couples that reported CCU (100%) while Group "B" included 20 couples with ICU (less than 100%). Once each couple arrived, a private room was used to explain the study in detail. An information sheet and an informed consent were signed by both the HIV-infected woman and her partner. Then, the HIV-infected woman received routine pap testing while the partner was interviewed regarding demographic data, as well as the practice and perceptions regarding condom use. The interview lasted 15 minutes, then the male partner was asked to stay in the waiting area. A similar interview was conducted for the HIV-infected woman. Finally, the male partner was invited into the room for a 5-minute open discussion. Three months later, all HIV-infected women were telephoned to ask about their practice in condom use.

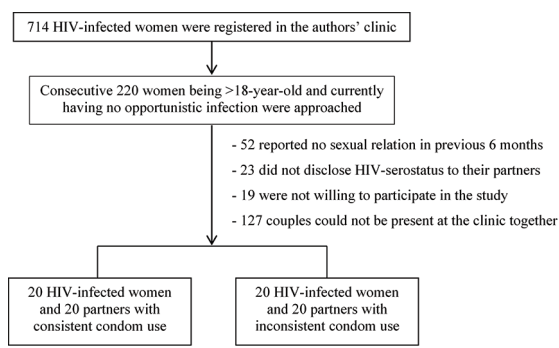
Outcome measure

An in-depth interview was used to explore perceptions and practices regarding condom use. All the interview process was done and recorded by one nurse who had 10-year experience in this field (Aneklap P). Reported reasons in previous studies^(8,14) were included as a checklist in the interview, including pregnancy desire, concern of sexual sensation or difficulty, partner's acceptance, and availability. Knowledge on condom use was evaluated using ten true-or-false questions (Table 1) before the educational session. These questions were based on key messages in the educational session and approved by the medical staff of the clinic. Each correct answer was counted equally as one score. Thus, the total score ranged from 0 to 10. Reported advantages and disadvantages of condoms were compared between HIV-infected women with CCU and those with ICU, and between their partners with CCU and those with ICU. Correlation of response between women and men was taken into consideration. In addition, confidence of using condoms, or knowing how

Table 1. Ten true-or-false questions for evaluating knowledge about condom

True statement	HIV-infected women (n=40); n (%)			Male partners (n=40); n (%)		
	CCU (n=20)	ICU (n=20)	p-value	CCU (n=20)	ICU (n=20)	p-value
Condom can prevent pregnancy and sexually transmitted infections (STIs).	18 (90)	17 (85)	0.633	19 (95)	20 (100)	0.311
Condom is a single-use method.	18 (90)	19 (95)	0.548	19 (95)	19 (95)	1.000
After ejaculation, contacting of genital organs can result in pregnancy or STIs.	19 (95)	19 (95)	1.000	18 (90)	18 (90)	1.000
Putting on condom must be done after having full erection.	19 (95)	20 (100)	0.311	20 (100)	20 (100)	1.000
Condom beyond expiry date or with torn package should not be used.	20 (100)	19 (95)	0.311	20 (100)	20 (100)	1.000
False statement						
Using two condoms at a time results in better protection of STIs.	16 (80)	14 (70)	0.465	15 (75)	8 (40)	0.025
Condom leads to sexual pain because of no lubrication.	16 (80)	15 (75)	0.705	18 (90)	17 (85)	0.633
Withdrawal is as effective as condom in terms of contraception.	18 (90)	18 (90)	1.000	18 (90)	20 (100)	0.147
There is only one condom size.	16 (80)	18 (90)	0.376	18 (90)	100 (100)	0.147
Putting on condom only during ejaculation can prevent HIV infection.	19 (95)	18 (90)	0.548	17 (85)	18 (90)	0.633

HIV=human immunodeficiency virus; CCU=consistent condom use; ICU=inconsistent condom use

**Figure 1.** Flow of the participants.

and when to put on condoms, was evaluated. In the interview, sexual acts referred to vaginal penetrations and mainly focused on the women's side.

Sample size and statistical analysis

All eligible HIV-infected women with their partners were invited into the present study. First consecutive 20 couples reporting CCU and 20 couples reporting ICU were included in the analysis.

Stata, version 12.0 (StataCorp LP, College Station, TX, USA) was used for statistical analysis. Descriptive data were presented in number (percent), mean \pm standard deviation (SD) and median with range. Continuous data were tested for normality of distribution using the Shapiro-Wilk test. Comparison between groups was done using the chi-square test and Student's t-test for continuous data with normal distribution, and the Wilcoxon rank sum test for continuous data with non-normal distribution. Some

of the interview was narratively described using quotation. A p-value of less than 0.05 was considered statistically significant.

Results

Of 714 HIV-infected women registered in the authors' clinic, 220 women were approached during the reminding call and 20 consecutive couples with CCU and 20 consecutive couples with ICU were included in the analysis (Figure 1). Among the 20 couples with ICU, ten reported condom compliance at more than 50%, eight used condoms less than 50%, and two reported no condom use at all.

The average age of HIV-infected women was 34.3 \pm 9.9 years (range 18 to 55 years). 22.5% (9/40) were educated to bachelor's degree or above while 17.5% (7/40) reported primary school as the highest level of education. Of them, 27.5% (11/40) were unemployed and 10.0% (4/40) were officers. The range of monthly household income was 645 (484 to 968) USD. Duration of time since diagnosis was 132 (54 to 156) months and the duration of ART taken was 60 (24 to 120) months. Of them, 15.0% (6/40) reported previous opportunistic infections, including pneumocystis carinii pneumonia (n=3), pulmonary tuberculosis (n=2), and pulmonary aspergillosis (n=2). Alcohol consumption was common in 14/40 (35%) of women and 33/40 (82.5%) of men were current users.

HIV-infected women reported a median of two lifetime sex partners (range 1 to 15). In the prior six months, all reported having one regular sexual partner. The male partners were on average two years older. Seroconcordance was found in 14/40 (35%).

Table 2. Characteristics of the participants and their partners (n=40 couples)

Characteristics	Group A: CCU (100%/always)	Group B: ICU (<100%)	p-value
	n (%)	n (%)	
HIV-infected women	(n=20)	(n=20)	
Age (years); mean±SD	35.0±10.9	33.5±9.0	0.639
Education: primary school	3 (15.0)	4 (20.0)	0.647
• Junior high school	9	8	
• High school	4	3	
• Bachelor degree or more	4	5	
Occupation: unemployed	5 (25.0)	6 (30.0)	0.826
• Temporary job	6	6	
• Business	7	6	
• Civil servant	2	2	
Monthly income <470 USD [#]	6 (30.0)	9 (45.0)	0.327
Number of lifetime sex partners; median (IQR)	3 (1, 3)	2 (2, 3)	0.707*
Number of sexual acts in prior 6 months (times/month); median (IQR)	8 (4, 10)	4 (4, 8)	0.023*
Alcohol consumption	5 (25.0)	9 (45.0)	0.185
HIV infection (months); mean±SD			
• Time since diagnosis	98.4±62.4	142.8±71.6	0.043
• Time since commencing ARV	63.4±54.1	87.0±55.9	0.182
History of opportunistic infections	1 (5.0)	5 (25.0)	0.077
Partners	(n=20)	(n=20)	
Age (years); mean±SD	37.7±9.7	36.4±9.4	0.671
Age difference [†] (years); median (IQR)	1 (-1, 6.5)	2.5 (-1, 5)	0.935*
Education: no/primary school	2 (10.0)	5 (25.0)	0.212
Occupation: unemployed	0 (0.0)	1 (5.0)	0.311
Alcohol consumption	18 (90.0)	15 (75.0)	0.212
Having children with the participants	12 (60.0)	16 (80.0)	0.168
Wanting more children	7 (35.0)	4 (20.0)	0.288
HIV infection	4 (20.0)	10 (50.0)	0.047

ARV=anti-retroviral drug; HIV=human immunodeficiency virus; SD=standard deviation; IQR=interquartile range

[†] Age difference = partner's age - HIV-infected woman's age, [#] Monthly income <470 USD is considered poor (1 USD=32 Baht), * Comparison was done using Wilcoxon rank sum test

Both HIV-infected women and their partners had comparable levels of education. Only one of the men was unemployed. Of all the couples, 28/40 (70%) had children and 11/40 (27.5%) wanted more. Disclosure of HIV serostatus was done in all the couples but the exact duration could not be recalled. Compared with HIV-infected women with CCU, those with ICU had lower sexual acts [4 (4, 8) versus 8 (4, 10), $p=0.0230$], a longer time since HIV diagnosis (142.8±71.6 months versus 98.4±67.4 months, $p=0.043$), and a higher proportion of HIV-infected partners (50% versus 20%, $p=0.047$) (Table 2).

There was no difference in perceived advantages and disadvantages of condom use in the study

population (Table 3). However, the acceptance was slightly lower in men than in women. Reduction of sexual sensation was the most commonly reported disadvantage of condom use in both men and women with ICU. They were also aware that ICU could bring in pregnancy and other sexually transmitted infections (STIs). Condom price was of more concern by couples with CCU.

Figure 2 shows the reported reasons of ICU and CCU. Among consistent condom users, both HIV-infected women and their partners reported that the prevention of HIV (15/20 versus 16/20), other STIs (17/20 versus 16/20), and the male partners' request to use condoms (11/20 versus 16/20,) as the

Table 3. Perception of advantages and disadvantages of condom use

	HIV-infected women (n=40); n (%)			Male partners (n=40); n (%)		
	CCU (n=20)	ICU (n=20)	p-value	CCU (n=20)	ICU (n=20)	p-value
Advantages						
Getting more virus	16 (80.0)	18 (90.0)	0.376	13 (65.0)	17 (85.0)	0.144
Onward transmission	17 (85.0)	19 (95.0)	0.292	17 (85.0)	12 (60.0)	0.077
Receiving drug-resistant strains	11 (55.0)	7 (35.0)	0.204	6 (30.0)	9 (45.0)	0.327
Prevention of pregnancy	12 (60.0)	19 (95.0)	0.008	14 (70.0)	13 (65.0)	0.736
Prevention of other STIs	15 (75.0)	17 (85.0)	0.429	15 (75.0)	17 (85.0)	0.429
Disadvantages						
Reduced sexual sensation	5 (25.0)	13 (65.0)	0.011	13 (65.0)	15 (75.0)	0.490
Slippage/inappropriate size	3 (15.0)	2 (10.0)	0.633	1 (5.0)	2 (10.0)	0.548
Price concern	4 (20.0)	4 (20.0)	1.000	8 (40.0)	2 (10.0)	0.028
Concern about partners' feeling	4 (20.0)	3 (15.0)	0.677	3 (15.0)	4 (20.0)	0.677
Increased sexual pain	7 (35.0)	6 (30.0)	0.736	1 (5.0)	4 (20.0)	0.151

HIV=human immunodeficiency virus; CCU=consistent condom use; ICU=inconsistent condom use; STIs=sexually transmitted infections

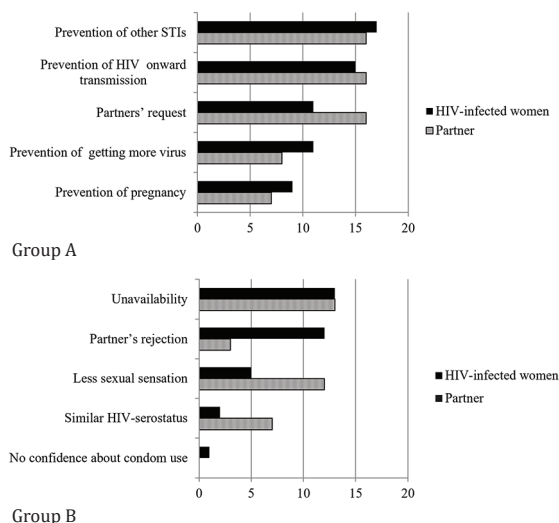


Figure 2. Reported reasons for consistent condom use (A) and inconsistent condom use (B) (X axis represent number of participants).

most common reasons, For couples reporting ICU, unavailability of condoms was the most common reason given by both partners (13/20). For the women, the second most common reason was partner's rejection (12/20), followed by 'less sexual sensation' (12/20).

Condom 'unavailability' was typically explained by the following examples.

Woman: "when we wanted to use condom, I was not sure where it was, maybe somewhere in another room and my husband did not want to wait."

Male partners: "I was just too lazy to find it in

the cupboard when we were in bed.", "I was shy to ask for more condoms from the clinic and too shy to buy it in any shops.", "I didn't want to buy because of its high cost.", or "I expected that my wife would prepare condoms for me."

Confidence of using condom, knowing when and how to use condoms, was evaluated, and showed that, of all participants, only one HIV-infected woman reported low confidence. Of all the women, 75% reported high confidence of using condom while 70% of male partners did. The in-depth interview in HIV-infected women with ICU, it showed that 6/20 (30%) never discussed about using condom in the previous six months. Most of their partners accepted but did not apply condom. In the next three months, 55% would always talk about condom use and 14/20 (70%) promised to use condom.

The 3-month follow-up telephone interview revealed that all women had the same partners. Among the HIV-infected women with ICU, eight couples (40.0%) had become consistent condom users, of which five women (25.0%) complained about decreased sexual sensation and three (15.0%) reported an increase in pain during intercourse. Of the two couples who had never used condoms before participating in the study, one couple reported CCU at three months. The male partner's refusal due to decreased sexual sensation remained the principal reason for not using a condom.

Discussion

In Thai HIV-infected couple, ICU associates

with longer time since diagnosis and partner's seroconcordance. The present study shows that male partners' decision lead to the behavior of condom use. Consistent with a report from Kenya⁽¹⁴⁾, the male partner's reluctance is one of the most common barriers to condom use. 'Lack of sexual sensation' was commonly reported by male partners in the present study. Risks of ICU and concerns regarding sexual sensation must be openly discussed with male partners. In Thai men, knowledge regarding condoms has been reported as an important factor for using a condom⁽¹⁸⁾ and an increased awareness can motivate behavioral change⁽¹⁹⁾.

Previous studies in African couples living with HIV^(2,4,6,9,14) showed that 16% to 75% reported ICU. This is compatible with that of Thai couples in the authors' previous report⁽¹¹⁾. However, the authors found no difference in educational level^(4,7,18), age⁽⁵⁾, income⁽⁷⁾, duration of taking ARV⁽⁷⁾, and socioeconomic status⁽¹³⁾ when comparing between male partners and between female partners. Previous studies in African population showed that disclosure of HIV serostatus between couples positively associated with CCU^(5,7,8) and CCU tends to occur in relationship with regular partners^(7,8). The present study focused on regular partners who disclosed their serostatus and demonstrated that male partners' acceptance is an important issue.

Despite the fact that all HIV-infected women and their partners received at least one intensive educational session, unavailability, as the most reported reason of ICU, reflects low motivation and awareness. The low effort to obtain condoms may be due to their cost and reduced sexual sensation. Male partners are more concerned about reduced sexual sensation and their rejection of condoms is very consequential to the relationship. Thus, adding to freely available condoms at the clinic, women's negotiation skills in sexual partnership^(14,20,21) should be emphasized. The skill should start with increased partnership communication⁽²¹⁾ and female partners' independence in terms of socioeconomic status is a key to success⁽¹³⁾. Nonetheless, communication between sexual partners can be negatively affected by alcohol consumption^(8,9,15). The behavior was very common in both women and their partners in the present study. Therefore, according to a meta-analysis that behavioral interventions for both partners together improve condom use compliance⁽²²⁾, both partners must be encouraged to quit alcohol consumption.

A qualitative study exploring the barriers of CCU among Kenyan HIV-serodiscordant couples

showed similar findings as the authors' in that men were reluctant to use condom and women could not deal with the upfront situation⁽¹⁴⁾. The present study demonstrates that the reluctance is from the concern of sexual sensation. Behavioral change intervention can be accomplished if they are motivated and deeply comprehend the benefit of condom use⁽¹⁹⁾. Although all men reported high confidence in using condom, over half of them were more concerned about degraded sexual sensation. In addition, like previous studies^(9,23), 7/10 (70%) of HIV-infected men thought that condom was not needed in seroconcordant couples. In the era of highly effective ART that undetectable viral load may be equal to untransmissible condition⁽²⁴⁾, non-condom relationship may be a positive encouragement toward perfect treatment protocol adherence.

Compatible with a previous study⁽²⁵⁾, condom use does not associate with HIV-related literacy. In the present study, the reported advantages, and disadvantages as well as knowledge regarding condom appear not related to the practice of condom use. The present study shows that more of the women with ICU realized that condom use prevents pregnancy whereas more of the men with CCU were concerned about the price of condom. Men in both groups reported 'reduced sexual sensation' as the main drawback of condom while more of the women with ICU did. Moreover, the knowledge evaluation showed that both men and women with CCU and ICU achieved comparably high scores. As a result, adding to the knowledge, family planning and sexual life should be included in the educational session in more practical ways.

The scarce data on this issue in Asian patients underlines the strength of the present study. In addition, the study design using in-depth interview by acquainted medical personnel may have encouraged honest responses and more candid communication. However, there are a few limitations. First, all HIV-infected women reported one partner each while, in fact, there could be more. Second, the participants' immune status^(13,26), depression⁽⁹⁾, and self-perception of being in good health⁽⁷⁾ was not studied, albeit being previously explored. Last, the application of the findings from the present study may be limited to heterosexual relationships where the female is HIV positive and that status has been communicated to the male partner.

Conclusion

Male partner is a pivotal factor of ICU in Thai HIV-infected heterosexual women. To mitigate the

problem, counseling to both HIV-infected women and male partners should include the issue of sexual concern.

What is already known on this topic?

Even as the condom is known for the STI's prevention particularly for HIV/AIDS, the male involvement is still the main obstacle for the practice. Thailand is a prominent country to promote condom use. A 100% condom use campaign so called "Meechai Condom" is globally well known to highlight the benefits of condom. However, usage is still under practiced in terms of "STI's prevention". Inconsistent use of condom is ranging from 23% to 84%. The factors related to ICU in Thai people living with HIV has not been reported.

What this study adds?

The access and availability of condoms is one of the key factors that influence in Thai HIV-infected heterosexual couples. Male involvement and belief play a vital role for this issue, particularly the myth of reduced sexual sensation, and the decreased satisfaction during the sexual intercourse. According to the authors' qualitative study, issue of sexual concern must be included in the educational sessions for this population.

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Conflicts of interest

The authors declare no conflict of interest.

References

1. Giannou FK, Tsiara CG, Nikolopoulos GK, Talias M, Benetou V, Kantzanou M, et al. Condom effectiveness in reducing heterosexual HIV transmission: a systematic review and meta-analysis of studies on HIV serodiscordant couples. *Expert Rev Pharmacoecon Outcomes Res* 2016;16:489-99.
2. Liu H, Su Y, Zhu L, Xing J, Wu J, Wang N. 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:e111175.
3. Siraprapasiri T, Ongwangdee S, Benjarattanaporn P, Peerapatanapokin W, Sharma M. The impact of Thailand's public health response to the HIV epidemic 1984-2015: understanding the ingredients of success. *J Virus Erad* 2016;2:7-14.
4. Cicconi P, Monforte A, Castagna A, Quirino T, Alessandrini A, Gargiulo M, et al. Inconsistent condom use among HIV-positive women in the "Treatment as Prevention Era": data from the Italian DIDI study. *J Int AIDS Soc* 2013;16:18591.
5. Conserve D, Sevilla L, Younge S, Mbwanbo J, King G. Condom use among HIV-positive sexually active adults and partner's HIV status in Dar es Salaam, Tanzania. *J Health Care Poor Underserved* 2012;23:191-203.
6. Lovejoy TI, Heckman TG, Sikkema KJ, Hansen NB, Kochman A, Suhr JA, et al. Patterns and correlates of sexual activity and condom use behavior in persons 50-plus years of age living with HIV/AIDS. *AIDS Behav* 2008;12:943-56.
7. 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;30:270-80.
8. Bachanas P, Medley A, Pals S, Kidder D, Antelman G, Benech I, et al. Disclosure, knowledge of partner status, and condom use among HIV-positive patients attending clinical care in Tanzania, Kenya, and Namibia. *AIDS Patient Care STDS* 2013;27:425-35.
9. Chakrapani V, Newman PA, Shunmugam M, Dubrow R. Prevalence and contexts of inconsistent condom use among heterosexual men and women living with HIV in India: implications for prevention. *AIDS Patient Care STDS* 2010;24:49-58.
10. Auchynnika A. Do HIV prevention interventions in Asia lead to increase in condom utilization?: A meta-analysis study. *Int J Health Plann Manage* 2019;34:232-40.
11. Chayachinda C, Thamkhantho M, Chalermchokcharoenkit A, Nuengton C, editors. Characteristics of women with sexually transmitted infections at the Siriraj Female STI Clinic. Bangkok: Siriraj International Conference in Medicine and Public Health; 2018.
12. Kiertiburanakul S, Wongprasit P, Phuphuakrat A, Chotiprasitsakul D, Sungkanuparph S. Prevalence of HIV infection, access to HIV care, and response to antiretroviral therapy among partners of HIV-infected individuals in Thailand. *PLoS One* 2018;13:e0198654.
13. Muchomba FM, Chan C, El Bassel N. Importance of women's relative socioeconomic status within sexual relationships in communication about safer sex and HIV/STI prevention. *J Urban Health* 2015;92:559-71.

14. 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;24:509-16.
15. Brown JL, DiClemente RJ, Sales JM, Rose ES, Gause NK, Safonova P, et al. Alcohol use, partner characteristics, and condom use among HIV-infected Russian women: An event-level study. *J Stud Alcohol Drugs* 2016;77:968-73.
16. Loathong K, Chayachinda C, Pongprasobchai S, Thanayatul P, Nooma P, Chalermchokcharoenkit A, et al. Factors influencing HIV serostatus disclosure among Thai women. *Sirij Med Bull* 2018;11:2-8.
17. Chalermchokcharoenkit A, Chayachinda C, Thamkhantho M, Komoltri C. Prevalence and cumulative incidence of abnormal cervical cytology among HIV-infected Thai women: a 5.5-year retrospective cohort study. *BMC Infect Dis* 2011;11:8.
18. Chamratrithirong A, Kaiser P. The dynamics of condom use with regular and casual partners: analysis of the 2006 National Sexual Behavior Survey of Thailand. *PLoS One* 2012;7:e42009.
19. Thato R, Daengsaard E. Determinants of behavior change intention among heterosexual Thai males diagnosed with sexually transmitted diseases. *AIDS Patient Care STDS* 2016;30:512-8.
20. Widman L, Golin CE, Noar SM. When do condom use intentions lead to actions? Examining the role of sexual communication on safer sexual behavior among people living with HIV. *J Health Psychol* 2013;18:507-17.
21. Gause NK, Brown JL, Welge J, Northern N. Meta-analyses of HIV prevention interventions targeting improved partner communication: effects on partner communication and condom use frequency outcomes. *J Behav Med* 2018;41:423-40.
22. LaCroix JM, Pellowski JA, Lennon CA, Johnson BT. Behavioural interventions to reduce sexual risk for HIV in heterosexual couples: a meta-analysis. *Sex Transm Infect* 2013;89:620-7.
23. Deuba K, Kohlbrenner V, Koirala S, Ekstrom AM. Condom use behaviour among people living with HIV: a seven-country community-based participatory research in the Asia-Pacific region. *Sex Transm Infect* 2018;94:200-5.
24. Eisinger RW, Dieffenbach CW, Fauci AS. HIV viral load and transmissibility of HIV infection: undetectable equals untransmittable. *JAMA* 2019;321:451-2.
25. Crepaz N, Hart TA, Marks G. Highly active antiretroviral therapy and sexual risk behavior: a meta-analytic review. *JAMA* 2004;292:224-36.
26. Hughes JP, Baeten JM, Lingappa JR, Magaret AS, Wald A, de Bruyn G, et al. Determinants of per-coital-act HIV-1 infectivity among African HIV-1-serodiscordant couples. *J Infect Dis* 2012;205:358-65.