

Condom Use among People Who Inject Drug (PWID): A Systematic Review on The Facilitators and Barriers

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ABSTRACT

Introduction: This review aimed to document findings from previous research to identify factors and barriers to condom use among PWID.

Material and Methods: We searched through three databases of PubMed, Scopus and Web of Science in November 2020. Published articles from 2010 through 2020 were screened. The facilitators and barriers of condom use were categorized into intrapersonal, interpersonal, organizational/institutional, community and public policy domains based on the Social Ecological Model (SEM) by Mc Leroy.

Results: We included 12 articles in the final review. Four out of five domains in SEM were found significantly impacting the condom use among PWID in this review.

Conclusion: The SEM provides a relevant framework to understand and analyze the differences and relationships of individual and social environmental factors that affect condom use among PWID. A multisectoral approach of promoting and strengthening widescale campaigns and education on condom use could achieve more exceptional and synergistic results.

KEY WORDS

factors, predictors, condom use, PWID, social ecological model

INTRODUCTION

People Who Inject Drugs (PWID) are among the most vulnerable group to HIV infection. According to UNAIDS, PWID are 22 times at more risk of HIV infection compared with the general population¹⁾. This risk particularly arises from sharing needles and injection and reinforced through criminalization, marginalization and poverty. There are approximately 11.8 million PWID worldwide with 13.1% of them living with HIV. Although the key risk factor for HIV infection among PWID are sharing injection needles and equipment, there is another group of people who are at increasing risk as well. This group is the sex partners of PWID. A study has shown a growing percentage of newly detected HIV cases among these sex partners²⁾. On the other hand, among PWID who do not have HIV yet, multiple studies have shown a relatively high prevalence of sexually transmitted infections (STIs) among them. This suggests that they practice risky sexual behaviors^{2,3)}. The onward transmission of HIV and non-HIV STIs to female sex partners is facilitated by high rates of unprotected sex among PWID²⁾. PWID have the potential to act as a bridging epidemic, from the mainly injecting route to heterosexual transmission.

Condom use is a critical component in a comprehensive and sustainable approach to the prevention of HIV and other STIs among PWID. Condom use was known to be the most accessible, cost-effective and sustainable way to reduce the risk of HIV and STI among marginalized populations⁴⁾. The maximum protective effect of condoms is achieved when their use is consistent rather than occasional⁵⁾. Meta-analyses showed that consistent condom use between discordant couples resulted in an overall 80% reduction in transmission risk of HIV and STI^{6,7)}. However, condom use among PWID remains low especially in

developing countries with a range of 11% to 51%¹⁾. This review aimed to identify facilitators and barriers to condom use among PWID and use the knowledge in condom use education and promotion.

METHODOLOGY

The search for this study was performed in November 2020, including articles published from 2010 until October 2020. Three databases were used; PubMed, Scopus and Web of Science. The search strategy included combined terms using the Boolean operators 'AND' and 'OR' with medical subject headings (MeSH) terms used are as follow:

('Predictors' OR 'Factors') AND
('Condom Use' OR 'Unprotected Sex') AND
('PWID' OR 'injecting drug user' OR 'IDU')

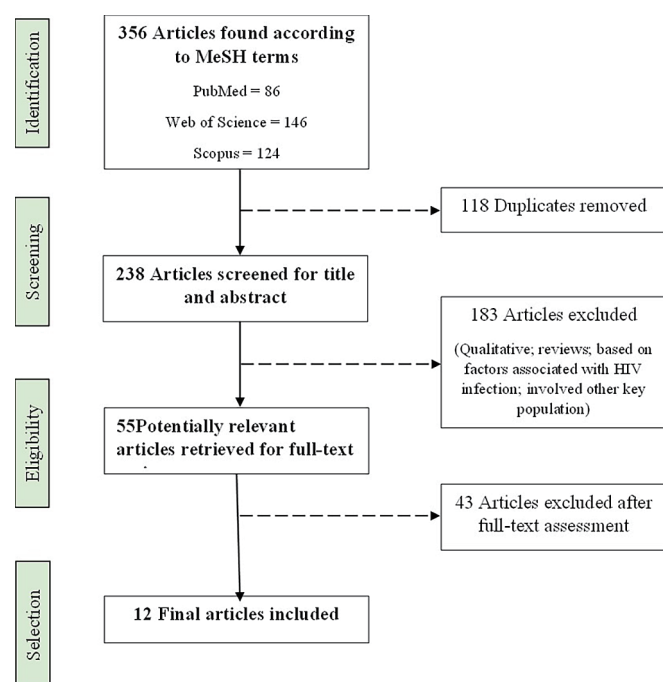
The eligibility criteria for our study were limited to open access academic articles written in English. Selected articles empirically assess the facilitators and barriers of condom use among PWID, through quantitative methods (multivariate analysis). The inclusion criteria are based on the PICO framework: a) Population --- people who inject drugs in all settings (hospital, treatment center, detention center and community); b) Intervention --- condom use; c) Comparison --- facilitators and barriers; d) Outcomes --- regarding the 5 levels dimension in the social ecological model. We excluded qualitative, non-empirical, review papers, articles without clear methods of condom use measurement and consistency.

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Table 1: Socio-ecological Model.

Domain	Description
Intrapersonal/individuals	individual characteristics that influence preventive behaviour such as perceived functional ability (perceived susceptibility, perceived severity, perceived barriers, perceived benefits). The socioeconomic status, educational level, employment status, motivational variables (knowledge, attitude, belief, self-efficacy) and medical problems also fall under interpersonal factors
Interpersonal	informal and formal social network and social support. They provide essential social resources, including emotional support, information, access to a new social contract and social role.
Organisational or institutional	component that explains formal and informal rules and regulations for performing preventive behaviour such as workplace schedules, financial policies, conducive environments, distance to the park and recreational area, availability of equipment, safety and climate.
Community	relationships among organisations, institutions and informational networks within defined boundaries, which include location in the community, built environment, neighbourhood associations, community leaders, commuting, parking, transportation, walkability, parks.
Public Policy	component that allocates resources to establish and maintain a coalition that provides a mediating structure connecting individuals and the broader social environment to create a better environment.

**Figure 1: Flowchart of study selection process**

Search results were imported into EndNote, and duplicates were removed. The basic information from the remaining articles was exported to a Microsoft Excel sheet. The authors then independently reviewed all titles, references and abstracts generated by the original search in order to identify articles for potential inclusion. In the next stage, a full article assessment was conducted, following the pre-specified inclusion criteria and the results were compared. Quality assessment was performed according to the Mixed Method Appraising Tool (MMAT) guidelines (Supplementary Material). Data extraction was performed using a standardized Excel spreadsheet, in which columns represent the categories of analysis. The included studies were classified according to several descriptive and analytical aspects, including authors; year; country; research method; sample size; condom use measurement and consistency of condom use. The data were then classified using the socio-ecological model that McLeroy *et al.*⁸ developed in 1988 as a theoretical framework involving interpersonal and intrapersonal factors, organizational and social factors, and environmental factors (Table 1).

RESULTS

The initial search retrieved 356 articles, with 118 duplicated. The title and abstract analysis resulted in the exclusion of 166 articles. In the full assessment of the 55 articles, 43 articles were excluded for falling outside the scope of this review, resulting in a final list of 12 articles (Figure 1).

Characteristics of the study

The twelve selected studies in this review were published between 2010 and 2020 (Table 2). Regarding the research country, the most frequent are Iran (2/12; 17%), China (2/12; 17%) and USA (2/12; 17%). Most of the studies have cross-sectional study design (10/12; 83%). Only two studies (2/12; 14%) use cohort designs. The sample size ranges from 157 to 7815 participants. The samples consisted of both men and women in 10 of the 12 studies and exclusively of men subjects in two studies. The samples in two studies involved HIV-positive PWID only while another study involved HIV-negative PWID. There are several methods of condom use measurement in this review. Studies in this review utilized a five-point Likert scale or a validated tool to determine the consistency of condom use in the past one, three or six months. Other methods were done by asking the samples whether they had ever used condoms, had used condoms during their last sex, or had use condom with different types of partners in the past 6 months. Variations in the consistency of condom use among the samples were observed in this study.

Facilitators and barriers to condom use

The Social-Ecological Model is a theory-based framework for understanding the multifaceted and interactive effects of personal and environmental factors that determine behaviors and for identifying behavioral and organizational leverage points and intermediaries for health promotion within organizations.⁸ In the framework of the McLeroy model, we examined the facilitators and barriers to condom use among PWID in the intrapersonal, interpersonal, organization/institutional, community and public policy domain (Table 3).

Intrapersonal Factors

From the literature review, 14 facilitators and 14 barriers are identified as intrapersonal factors. The factors affecting condom use are sociodemographic characteristics, HIV status, perceived HIV risk, injection/drugs history and sexual history. Sociodemographic characteristics are key facilitators in this review. Higher income, being single and unmarried, living outside hometown, high education and living alone were associated with condom use in several studies. The second most important facilitator related to intrapersonal factors is history of previous injections/drugs. Other facilitators include awareness of HIV status

Table 2: Study Characteristics

Author/year	Country	Study design	Sample size	Condom use measurement	Consistency of condom use
Todd <i>et al.</i> ⁹	Afghanistan	Cross sectional	1078 male PWID	condom use at any sexual encounter	27.6% of those sexually active use condom
Grau <i>et al.</i> ¹⁰	Russia	Cross sectional	157 HIV positive PWID	condom use at last sexual intercourse in the previous 6 months	50% use condom last sexual intercourse
Fu <i>et al.</i> ¹¹	United State	Cohort	362 HIV-positive PWID initiating HAART	Unprotected sex last 6 months	51.7% use condom
Mirabi <i>et al.</i> ¹²	Iran	Cross-sectional	360 male heterosexual PWID	Unprotected anal intercourse for the last 1 month	20.8% did not use condom
Chen <i>et al.</i> ¹³	China	Cohort	5035 PWID enrolled in MMT	unprotected sex in the previous sexual intercourse	56.9% at first follow up 54.1% at second follow-up
Assari <i>et al.</i> ¹⁴	Iran	Cross sectional	1131 PWID	inconsistent condom use as any answer except often (likert scale)	83.3% inconsistent condom use
Mazhnaya <i>et al.</i> ¹⁵	Ukraine	Cross-sectional	1379 PWID	condom use at every event during sex during the recall period (90 days)	19% consistent condom use with permanent partner
Chen <i>et al.</i> ¹⁶	China	Cross-sectional	916 PWID	not always using condoms with any of their commercial sexual partners	12.2% not use condom
Hotton & Boodram ¹⁷	US	Cross sectional	162 PWID	condom use with regular/steady and casual partners in the past 6 month	Male 71.6% Female 35,3% Not use condom
Tran <i>et al.</i> ¹⁸	Vietnam	Cross sectional	300 PWID newly admitted to the MMT programme	Condom use last sexual intercourse	49.3% use condom
Sharma <i>et al.</i> ¹⁹	India	Cross-sectional	916 PWID	participants did not use condoms at all sexual encounters	46% at baseline 43.5% (FV1), and 37.0% (FV2)
Dumchev <i>et al.</i> ²⁰	Ukraine	Cross sectional	7815 HIV-negative PWID.	always using condom with all partners in the past three months	39.3% of all at-risk participants and 29.5% of those receiving the service report always using condoms

and highly perceived HIV risk.

The most significant intrapersonal barrier is sociodemographic status, which includes unemployment, being married/cohabiting, being between the ages of 40 and 60, and living with family. The second most important group of intrapersonal barriers was previous injection/drug history, which included methamphetamine use, a lengthier history of drug use, and injecting drugs prior to MMT. Other barriers include sexual history which is a shorter duration of abstinence.

Several intrapersonal factors were identified in this review as both facilitators and barriers. Lower income, younger age, and male status were all identified as facilitators in several studies and as barriers in other studies.

Interpersonal Factors

In the interpersonal domain, three facilitators and two barriers are identified (Table 3). Having multiple partners and a partner who is negative HIV status are the facilitators of condom use. Meanwhile, in the interpersonal domain, greater trust in the partner is a barrier to condom use. In two separate studies, living with a partner was cited as a facilitator and a barrier.

Organizational/Institutional Factors

There are one facilitator and two barriers identified in this domain. Access to health services and treatment options such as antiretroviral therapy (ARV) and methadone maintenance therapy (MMT) all contribute to PWID condom use. Condom use barriers in this domain are asso-

ciated with the treatment plan, which includes a lower mean methadone dosage and a lower level of treatment adherence.

Community Factors

The presence of extensive social networking in the community was identified as a barrier in this domain. This review identified no facilitators for this domain.

Public Policy Factors

This review identified no facilitators or barriers to this domain.

DISCUSSION

Considering the growing number of HIV cases worldwide, enhancing condom use intervention among PWID will be an important strategy of preventing HIV transmission in this key population. However, there are facilitators and barriers that contribute to the success of interventions and programs. This review substantiates the principle of the Social Ecological Model²⁹ on the critical nature of comprehending the interacting elements from the individual and social environment levels. All components interact to explain the causes of preventive behavior, and more crucially, they will be used in the future to build comprehensive interventions at each level of influence^{8,30}. In general, the social ecologi-

Table 3: Facilitators and Barrier to condom use

Domain	Factors	Facilitators	Barriers
Intrapersonal	Sociodemographic	-Higher income ⁸	-Lower income ²³
		-single/unmarried ²¹	-Unemployment ²⁷
		-Younger age ^{8,21,22}	-Married/cohabiting ²⁸
		-Living outside hometown ⁸	-Young Age ²⁷
		-Male ²²	-Age 40-60 years old ²⁸
		-High education ²³	-Non local resident ²⁸
		-Living alone ²²	-Male ¹¹
HIV status	-Lower income ²²	-Living with family ¹⁵	
	-Aware of HIV status ^{24,25}	-HIV negative ¹⁵	
Perceived risk	-HIV/HCV positive ¹¹		
	-High perceived HIV risk ²¹		
Previous injection/drug history	-History of sharing needle ²³	-History of methamphetamine use ²⁸	
	-Home as injection place ²³	-Longer history of drug use ¹¹	
	-Shorter injection history ²²	-Injecting drugs prior to MMT ¹¹	
Sexual history	-Among opioid user ²²	-Shorter duration of abstinence ¹¹	
Interpersonal	Partner	Negative serostatus of partner ²³	Living with partner ¹¹
		Multiple partner ⁸	Greater trust to partner ^{1,27}
		Living with partner ¹²	
Organizational/institutional	Availability of treatment/services	Access to treatment ARV/MMT ^{23,12,26}	
	Treatment plan and adherence		Lower mean dosage of methadone ²⁷ Lower level of treatment adherence ²⁷
Community	Community linkage	-	High social networking within community ¹¹
Public Policy		-	-

cal model is a comprehensive multilevel framework that includes contributors to active behavior at all levels: individual (interpersonal and intrapersonal)⁹, social, environmental, and policy. Four out of five domains in the SEM were found to have a significant effect on condom use among PWID in this review. This section will discuss each of these four domains separately.

Interpersonal factors

The majority of factors that influence condom use occur on an intrapersonal level. These factors are generally associated with sociodemographic characteristics, HIV status, perceived HIV risk, history of injection/drugs, and sexual history. Sociodemographic characteristics were mentioned in the majority of articles as facilitators (14 times) or barriers (14 times) to condom use. This finding was consistent with another review involving another key population^{31,32}. Eight articles in this review indicated that sociodemographic characteristics were a significant predictor of condom use among PWID. Among the factors, younger age groups were mentioned in four articles, three as facilitators and one as a barrier. Based on personal learning, increasing age will increase the confidence level in the ability to use condom^{27,33,34}. However, there are other factors such as sexual experience which will directly and indirectly affect self-efficacy for condom use³⁵. People with high condom self-efficacy will use condoms, whereas those who have self-doubts about their ability to use condoms will not do so³⁶. In view of both factors which is interrelated, condom use promotion and intervention should be targeted to younger age group for this population. This will help them to realize their HIV risk, clarify their misconceptions on condom use, and encourage them to practice the use of condoms from young. As age increases, other intrapersonal factors may further hinder the use of condom. The other intrapersonal factor which affects condom use was marital status. Being single or unmarried was identified as a facilitator, whereas being married or cohabiting was identified as a barrier in this review. This could be due to a lack of trust in the relationship or difficulties in negotiating condom use between sexual partners, which is directly related to marital status^{22,37}. Gender power imbalances between men and women where the decision making to use condoms was made by men also limit the ability of women to use condoms³⁸. Based on this, future condom use intervention and prevention should be

focused on gender equality. HIV status and perceived risk of HIV were also important determinants of condom use in PWID. These findings emphasize the critical nature of public health interventions aimed at increasing awareness and facilitating HIV testing among PWID. HIV awareness campaigns can help individuals understand their HIV risk, dispel common misconceptions about condom use, and encourage them to use condoms properly.

Interpersonal factors

The partner of a PWID is one of the important determinants of condom use among PWID. In this review, having multiple partners and partners with negative HIV status were found to facilitate condom use among PWID. This finding contradicts previous research indicating that having had only one sexual partner or having had only one sexual partner in the preceding year is associated with a higher likelihood of condom use³⁹. This could be due to the interactive effect of other factors such as HIV knowledge, which highlighted multiple partner relationships as a risk factor for HIV. Condom use with an HIV-negative partner suggests that being aware of a partner's HIV status can help PWID engage in safer sexual practices. Despite of that, a study was done in French show that the affection intensity in a relationship will determine the use of condom among sexual partner²⁸. The result show that condom use will be reduced once the relationship became stable and intimate. Therefore, condom use was high in casual partner if compare to casual partner. The variability of condom use between partner types will pose challenges in condom use prevention and intervention programs.

Organizational/institutional factors

Access to health services and treatment facilitate condom use among PWID. This result was consistent with another study conducted in seven countries throughout the Asia-Pacific region, in which it was discovered that not receiving ARV treatment was associated with inconsistent condom use²⁶. Treatment with either ARV or MMT provide a comprehensive approach to other factors which contribute to condom use such as HIV knowledge, HIV risk perception and condom availability. However, in the community which have high condom related stig-

ma, there will be a lack of condom use discussion with the health provider. They will not be getting condoms from the health facilities for this reason⁴⁰. Therefore, condom use prevention and intervention programs should also focus on intervention to reduce condom-related stigma in the community.

Community factors

A high level of social networking in the community acts as a barrier to condom use. The number of network members and the roles they play can influence risk behaviors and, consequently, on HIV prevention of transmission strategies. Studies among drug users have shown that individuals interact with many of their network members in multiple ways, and those with more multiplex network relationships frequently engage in riskier drug use and sex behaviours^{21,24}. Friends can be the ones who promote condom use and can also be the ones who are against it. Here comes the role of NGOs that represent this PWID. They will act as the peer educator, educating and promoting the use of condoms among their group and also distributing condoms. This will increase the knowledge and uptake of condom in contexts with friends⁴⁰. However, further research is needed, to identify the source of information and to make sure the information is correct and widely disseminated among the members.

Limitation and recommendations

There are several limitations in this study that should be emphasized. First of all, most of the studies in this review were observational studies. Therefore, there will be intrinsic biases causing evidence of the causal impact of identified factors on condom use could not be established. Further research should emphasize on a long-term cohort and intervention study to prove the temporal relationship between the identified factors on condom use. The other limitations are the variability of condom use measurement and reporting. There was no goal standard on condom use measurement. The self-reporting and measurements were influenced by participation bias, desirability bias and memory error which could not prove the accuracy. Further research should develop a standard set of measurements of condom use to increase the accuracy.

CONCLUSION

The Social Ecological Model provides a useful framework for comprehending and analyzing the differences and relationships between individual and social environmental factors that influence condom use. Condom use interventions that are exclusively focused on the individual may be insufficient to produce transformative and sustainable outcomes. A multisectoral approach to condom use promotion and education could achieve more exceptional and synergistic results.

DECLARATION OF COMPETING INTEREST

No potential conflicts of interest relevant to this article were reported.

ETHICAL APPROVAL

Ethical approval is not required.

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REFERENCES

1. Unaid. Global Hiv & Aids Statistics 2019 Fact Sheet 2019 [cited 2021 20 sept 2021]. Available from: <https://www.unaids.org/en/resources/fact-sheet>.
2. Solomon SS, Srikrishnan AK, Celentano DD, Johnson SC, Vasudevan CK, Murugavel KG, *et al*. The intersection between sex and drugs: a cross-sectional study among the spouses of injection drug users in Chennai, India. *BMC public health*. 2011; 11(1): 1-10.
3. Niccolai LM, Sheherbakova IS, Toussova OV, Kozlov AP, Heimer R. The potential for bridging of HIV transmission in the Russian Federation: sex risk behaviors and HIV prevalence among drug users (DUs) and their non-DU sex partners. *Journal of urban health*. 2009; 86(1): 131-43.
4. Bom RJ, van der Linden K, Matser A, Poulin N, van der Loeff MFS, Bakker BH, *et al*. The effects of free condom distribution on HIV and other sexually transmitted infections in men who have sex with men. *BMC infectious diseases*. 2019; 19(1): 1-10.
5. Tuot S, Pal K, Thin K, Patio C, Ailbritton K, Blondek C, *et al*. Determinants of inconsistent condom use among HIV serodiscordant couples in Cambodia. 2016.
6. Larney S, Peacock A, Leung J, Colledge S, Hickman M, Vickerman P, *et al*. Global, regional, and country-level coverage of interventions to prevent and manage HIV and hepatitis C among people who inject drugs: a systematic review. *The Lancet Global Health*. 2017; 5(12): e1208-e20.
7. Weller SC, Davis-Beaty K. Condom effectiveness in reducing heterosexual HIV transmission. *Cochrane database of systematic reviews*. 2002(1)
8. McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. *Health education quarterly*. 1988; 15(4): 351-77
9. Todd CS, Nasir A, Raza Stanekzai M, Abed AM, Strathdee SA, Bautista CT, *et al*. Prevalence and correlates of syphilis and condom use among male injection drug users in four Afghan cities. *Sexually transmitted diseases*. 2010; 37(11): 719-25.
10. Grau LE, White E, Niccolai LM, Toussova OV, Verevchkin SV, Kozlov AP, *et al*. HIV disclosure, condom use, and awareness of HIV infection among HIV-positive, heterosexual drug injectors in St. Petersburg, Russian Federation. *AIDS and behavior*. 2011; 15(1): 45-57.
11. Fu TC, Westergaard RP, Lau B, Celentano DD, Vlahov D, Mehta SH, *et al*. Changes in sexual and drug-related risk behavior following antiretroviral therapy initiation among HIV-infected injection drug users. *Aids*. 2012; 26(18): 2383-91.
12. Mirabi P, Vassel MY, Moazen B, Sehat M, Rezaadeh M, Ahmadi K. Unprotected anal intercourse among Iranian intra-venous drug users. *Frontiers in Public Health*. 2013; 1(SEP): 34.
13. Chen W, Xia Y, Hong Y, Hall BJ, Ling L. Predictors of continued HIV-risk behaviors among drug users in methadone maintenance therapy program in China--A prospective study. *Harm reduction journal*. 2013; 10(1): 23.
14. Assari S, Vassel MY, Tavakoli M, Sehat M, Jafari F, Narenjiha H, *et al*. Inconsistent condom use among Iranian male drug injectors. *Frontiers in Psychiatry*. 2014; 4
15. Mazhnaya A, Andreeva TI, Samuels S, DeHovitz J, Salyuk T, McNutt LA. The potential for bridging: HIV status awareness and risky sexual behaviour of injection drug users who have non-injecting permanent partners in Ukraine. *Journal of the International AIDS Society*. 2014; 17(1): 18825.
16. Chen B, Zhu Y, Guo R, Ding S, Zhang Z, Cai H, *et al*. HIV/AIDS-related knowledge awareness and risk behaviors among injection drug users in Maanshan, China: A cross-sectional study. *Health behavior, health promotion and society*. *BMC Public Health*. 2016; 16(1).
17. Hotton AL, Boodram B. Gender, Transience, Network Partnerships and Risky Sexual Practices Among Young Persons who Inject Drugs. *Aids and Behavior*. 2017; 21(4): 982-93.
18. Tran BX, Mai HT, Fleming M, Do HN, Nguyen TMT, Vuong QH, *et al*. Factors associated with substance use and sexual behavior among drug users in three mountainous provinces of Vietnam. *International Journal of Environmental Research and Public Health*. 2018; 15(9).
19. Sharma V, Tun W, Sarma A, Saraswati LR, Pham MD, Thior I, *et al*. Prevalence and determinants of unprotected sex in intimate partnerships of men who inject drugs: findings from a prospective intervention study. *International Journal of Std & Aids*. 2019; 30(4): 386-95.
20. Dumchev K, Sazonova Y, Smyrnov P, Cheshun O, Pashchuk O, Saliuk T, *et al*. Operationalizing the HIV prevention cascade for PWID using the integrated bio-behavioural survey data from Ukraine. *Journal of the International AIDS Society*. 2020; 23 Suppl 3(Suppl 3): e25509.
21. Latkin CA, Mandell W, Knowlton AR, Doherty MC, Vlahov D, Suh T, *et al*. Gender differences in injection-related behaviors among injection drug users in Baltimore, Maryland. *AIDS Education and Prevention*. 1998; 10(3): 257.
22. Crosby RA, DiClemente RJ, Salazar LF, Wingood GM, McDermott-Sales J, Young AM, *et al*. Predictors of consistent condom use among young African American women. *AIDS and Behavior*. 2013; 17(3): 865-71.
23. Armstrong G, Nuken A, Medhi GK, Mahanta J, Humtsoe C, Lalmuanpuai M, *et al*. Injecting drug use in Manipur and Nagaland, Northeast India: injecting and sexual risk behaviours across age groups. *Harm reduction journal*. 2014; 11(1): 27.
24. Friedman SR, Neaigus A, Jose B, Curtis R, Goldstein M, Ildefonso G, *et al*. Sociometric risk networks and risk for HIV infection. *American journal of public*

- health. 1997; 87(8): 1289-96.
25. Hu Y, Liang S, Zhu J, Qin G, Liu Q, Song B, *et al.* Factors associated with recent risky drug use and sexual behaviors among drug users in Southwestern China. *Journal of AIDS and Clinical Research.* 2011; 2(3).
 26. Deuba K, Kohlbrenner V, Koirala S, Ekström AM. Condom use behaviour among people living with HIV: a seven-country community-based participatory research in the Asia-Pacific region. *Sexually transmitted infections.* 2018; 94(3): 200-5.
 27. Barkley Jr TW, Burns JL. Factor analysis of the Condom Use Self-Efficacy Scale among multicultural college students. *Health Education Research.* 2000; 15(4): 485-9.
 28. Bajos N, Ducot B, Spencer B, Spira A. Sexual risk-taking, socio-sexual biographies and sexual interaction: Elements of the French national survey on sexual behaviour. *Social Science & Medicine.* 1997; 44(1): 25-40.
 29. Ali MS, Tesfaye Tegegne E, Kassa Tesemma M, Tesfaye Tegegne K. Consistent condom use and associated factors among HIV-positive clients on antiretroviral therapy in North West Ethiopian Health Center, 2016 GC. *AIDS research and treatment.* 2019; 2019.
 30. Glanz K, Rimer BK, Viswanath K. *Health behavior and health education: theory, research, and practice:* John Wiley & Sons; 2008.
 31. De Torres RQ. Facilitators and barriers to condom use among Filipinos: A systematic review of literature. *Health Promotion Perspectives.* 2020; 10(4): 306.
 32. McLachlan C, Dune T. A Systematic Review of Factors Influencing Condom Use among Female Sex Workers. *Int'l J Soc Sci Stud.* 2020; 8: 97.
 33. Farmer MA, Meston CM. Predictors of condom use self-efficacy in an ethnically diverse university sample. *Archives of sexual behavior.* 2006; 35(3): 313-26.
 34. Sayles JN, Pettifor A, Wong MD, MacPhail C, Lee S-J, Hendriksen E, *et al.* Factors associated with self-efficacy for condom use and sexual negotiation among South African youth. *Journal of acquired immune deficiency syndromes (1999).* 2006; 43(2): 226.
 35. Ajayi AI, Olamijuwon EO. What predicts self-efficacy? Understanding the role of sociodemographic, behavioural and parental factors on condom use self-efficacy among university students in Nigeria. *PLoS one.* 2019; 14(8): e0221804.
 36. Kwok Q, Chau J, Holroyd EA. Examining the relationships between condom use self-efficacy and condom use among mainland Chinese sex workers in Hong Kong. *J Nurs Sci Vol.* 2010; 28(2).
 37. Manaf RA, Dickson N, Lovell S, Ibrahim F. Consistent condom use and its predictors among female sexual Partners of People who Inject Drugs in Klang Valley, Malaysia. *BMC public health.* 2019; 19(1): 1473.
 38. Rwafa T, Shamu S, Christofides N. Relationship power and HIV sero-status: an analysis of their relationship among low-income urban Zimbabwean postpartum women. *BMC Public Health.* 2019; 19(1): 1-10.
 39. Ajayi AI, Ismail KO, Akpan W. Factors associated with consistent condom use: a cross-sectional survey of two Nigerian universities. *BMC public health.* 2019; 19(1): 1207.
 40. Restar AJ, Adia A, Nazareno J, Hernandez L, Sandfort T, Lurie M, *et al.* Barriers and facilitators to uptake of condoms among Filipinx transgender women and cisgender men who have sex with men: a situated socio-ecological perspective. *Global public health.* 2020; 15(4): 520-31.