The Effect of Needle and Syringe Program on Injecting Drug Users' Use of Non-Sterile Syringe and Needle Behaviour in Palembang, South Sumatera Province, Indonesia

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ABSTRACT

Introduction	HIV/AIDS has become one of international public health problem. An effective method to spread HIV/AIDS is through shared needle and syringe among Injecting Drug Users (IDUs). Many studies have been undertaken to know the effect of Needle and Syringe Program (NSP) to reduce the risk behaviours of IDUs in sharing needle and syringe among IDUs. NSP has been implemented in Palembang since 2009. However, there is no previous research to examine IDUs behaviours in using non sterile injection and syringe in Palembang.Therefore, a research is needed to be undertaken to know the effect of NSP on IDUs' behaviours in using sterile needle an syringe.
Objective	To identify association between seeking behaviours of NSP on IDUs' behaviours in using sterile needle and syringe.
Methods	This was a case control study with respondents recruited using snowball and purposive technique. Simple and multiple logistic regression tests were performed using statistics program (Stata version 10) to identify main association between NSP access status and behaviours of using non-sterile needle and syringe. Some possible confounders were also explored. Odds ratio, 95 % Confidence interval and P value were reported.
Results & Discussion	There were 121 IDUs, consisting of 41 IDUs in cases group (High risk group to use non sterile injection and syringe) and 80 IDUs in control group (low risk group to use non sterile injection and syringe). Mostly, respondents were male with senior high school education level and single status. Crude odds ratio indicated that IDUs accessing NPSs had an odds of 1.07 to share needle and syringe among IDUs compared to IDUS without accessing NSPs (OR=1.07, 95 % CI = 0.49-2.31), p=0.87). After OR was adjusted by knowledge about the spread and prevention of HIV/AIDS, IDUs' Attitude towards Harm Reduction, education level, age, length of using Injectig, and income level, IDUs accessing NSPS tend to minimize their behaviours to share needle and syringe compared to IDUs in NSPs group by 29 % (odd ratio, 0.69, 95 % CI = 0.23-2.06, p=0.51). P value showed that there is weak evidence against the null hypotesis of no association between IDUs accessing NSPs and risk behavior of using non-sterile needle and syringe. Previous studies indicated that IDUS using NSPs tend to reduce the use of shared needle and syringe, and tend to wash their needle and syringe before another IDUs use them again (Gibson, 2001, Wodak A & Cooney A 2006). Therefore, NSP increase awareness of IDUs to prevent the spread of HIV/AIDS.
Conclusion	Availability of NSP appeared to reduce the use of shared or non-sterile syringe or needle in this study, although the association was not significant. One of the reasons could be the free access of needle and syringe in pharmacy could be one confounding factors that contributed

to this non significant association. Further research with bigger sample size and qualitative research to explore more in-depth information about IDUs' behaviours in using non-sterile injection and syringe is recommended.

INTRODUCTION

Background

HIV / AIDS has become a public health problem worldwide. Based on reports from the World Health Organisation (WHO) and Joint United Nations Programme on HIV / AIDS (UNAIDS), the estimated number of people living with HIV is on average of 33 million people worldwide at the end of 2007 (1, 2) of new HIV cases and deaths due to AIDS is predicted to increase to about 2.7 million and 2 million each, including 27 000 children in the same year (WHO, 2008a). Then, 25 million people have died of AIDS worldwide since the epidemic of HIV in 1981 (WHO, 2008b). One effective means to spread HIV and other blood borne diseases viruses/BBVs) is through shared injection and syringe of drug use. Once HIV infects one IDUs, prevalence of HIV could increase by 90 % less than 2 years (3).

In Indonesia, HIV prevalence among Injecting Drug Users (IDUs) increases significantly in a short time. In 2000, HIV prevalence among IDUs reached above 5 % in 2000. Then, this level increase between 21% and 52 % in 2006 and 52.4 % in 2007 (4). HIV among IDUs has has the highest prevalence than other high risk groups in Indonesia, estimated about 55-58 % (5). Furthermore, shared needle and syringe uses among IDUs usuallly occured. Pisani (6) found that 85 % among IDUs in three cities in Jakarta, Surabaya and Bandung have shared injection and syringe among other IDUs in previous week found that 85% of IDUs in 3 cities, Jakarta, Surabaya and Bandung. Therefore, the spread of HIV has been rampant in Indonesia.

One effective way halting spread HIV/AIDS in a short time is providing clean needle and syringe for IDUs. Needle and Syringe Program (NSP) has been applied in many countries. Previous studies indicates that NSPs is able to reduce high risk behaviours of IDUS including sharing needles and syringes (AHRN & CHR Burnet Institute, 2003). Gibson, David R et al (2001) identified 42 research related to NSP effectiveness from 1989 to 1999. The results indicated that NSP users tend to stop drug use, reduce to use shared needle and syringe and more often wash their needle and syringe before reuse (Gibson, 2001). Wodak A & Cooney A (2006) in their systematic review also support Gibson findings. In Indonesia, there is limited research related to NSP's effectiveness. Therefore, identification of NSPs effect on reducing high risk behaviours of IDUs in using shared needles and syringe is urgently needed.

METHODS

Research Design

This study is an observational research with quantitative methods. Quantitative method is analytical descriptive method with case control design. The cases group is that IDUs are at risk behavior using non-sterile syringe, including borrowing or sharing syringes and equipment together syringe without cleaning process in the last 12 months. While the control group were IDUs who did not behave at risk of using non-sterile syringe in the last 12 months.

Location research and data collection

Research was conducted in the city of Palembang. Primary data was collected in this study by three active/ non-active IDUs in Palembang who was trained by researchers. Researchers also worked together with Palembang AIDS Commissions and Narcotics Agency in Palembang in doing data collection to reach more hidden IDUs. Some standardized questionnaires from previous survey related to this topic were combined and developed.

Population and Sample

The population in this study were all IDUs in the city of Palembang. IDUs are including 'Hidden Populations' or hidden populations. The sample in this study were IDUs who are willing to participate in this study. The estimated population of IDUs in 16 Districts around 1152 IDUs and their partners (7). Due to limited funds, the sample number was limited to 100 IDUs (plus 10-20 IDUs) (Table 1). Samples were taken by combined tehniques; Snowball technique and Purposive by trained surveyors. Some of the points made in several districts in the city of Palembang, then the first sample is expected to invite the their fellows IDUs to become the next sample and so on.

Data Analysis

Quantitative data was processed using a statistical program, Stata version 10, with univariate, bivariate and multivariate analysis. Before the data was processed, all data was rechecked to minimize data entry errors, missing data, and data misclarification.

First, univariate analysis was performed. Confounding factors (confounding factors) such as age, duration of injecting, length of Injecting drug

use, socioeconomic factors, knowledge of transmission and prevention of HIV / AIDS and attitudes towards harm reduction were also analyzed. For continuous variables, the means and standard deviation was reported if the variables have normal distribution, while the median and range was reported if the data distribution of variables is skewwed. The percentages of each variable were reported for categorical variables. Normal distribution was explored by using Graph Histograms and normality tests 'skewness and kurtosis'. Furthermore, simple logistic regression and multiple logistic regression were conducted to analyze the effect of NSP and risky behavior of using non-sterile injection and syringe. P value, odds ratio (OR) and 95 % conficence interval was reported.

RESULTS

Characteristics of IDUs (IDU's)

Table 1 shows that among 121 IDUs in this study, 41 people are included in case group,who behave in risky and 80 IDUs are included in control group who behave less risky behaviour in using non-sterile syringes. Generally, IDUs are male, and singletons (table 1). The respondents are spread across 14 districts in the city of Palembang (Figure 1). IDUs knowledge of prevention and transmission of HIV / AIDS is generally high, but attitudes towards injecting drug users harm reduction (Harm Reduction), is better in control group than the case group (Table 1).

Figure 1 The Districts of IDUs in Palembang in the Research

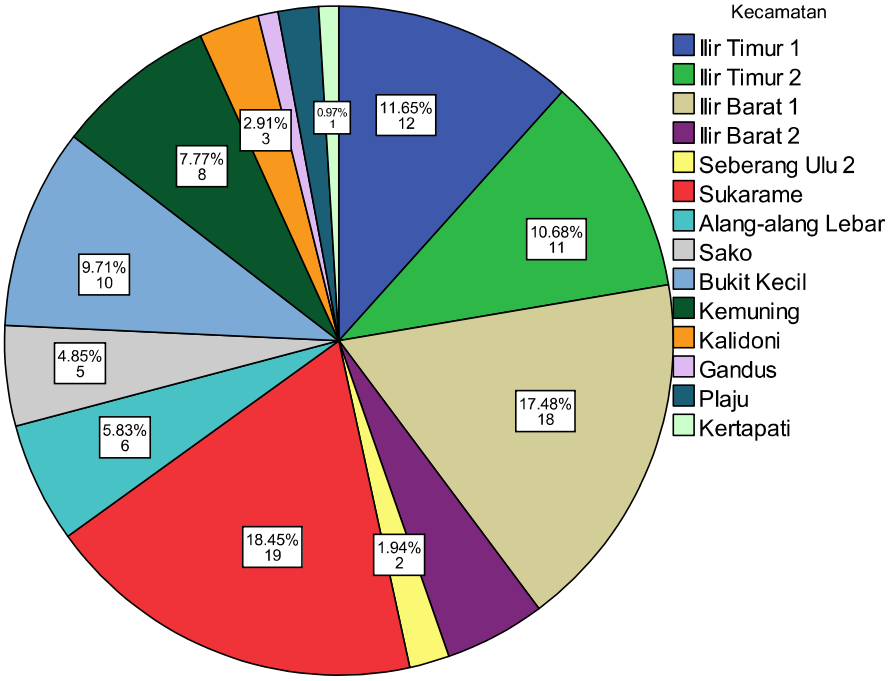

Table 1 IDUs Characteristics in case and control groups

Karakteristik	Cases Group (n,%) N= 41	Control Group (n.%) N= 80
Sex		
Man (n,%)	40(97,7%)	80 (100%)
Education		
Never school (n,%)	1 (2,4%)	-
Junior High School (n,%)	2 (4,9%)	5 (6,3%)
Senior High School (n,%)	28 (68.3%)	50 (62,5%)
Diplomai (n,%)	6(14,6%)	12 (15,0%)

University (n,%)	4 (9,8%)	12 (15,0%)
Others (n,%)	-	1 (1,3%)
Employment Status		
Yes(n,%)	26 (63,4%)	61 (76,3%)
Occupation		
Enterpreneurs (n,%)	18 (69,2%)	36 (58,1%)
Civil Servants (n,%)	-	8 (12,9%)
Private employee(n,%)	8 (30,8%)	18 (29,0%)
Income Sources		
Employee salary (n,%)	12 (46,2%)	31 (50%)
Enterpreneur work (n,%)		
Others (n,%)	10 (38,5%)	30 (48,4%)
	4 (15,4%)	1 (1,6%)
Income/month		
Rp.500.000- 1 juta (n,%)	4 (15,4%)	13 (21%)
Rp.1 juta- 1,5 juta (n,%)	5 (19,2%)	24 (38,7%)
Rp.1,5 juta- 2 juta (n,%)	8 (30,8%)	14 (22,6%)
Rp.2 juta- 2,5 juta (n,%)	7 (30%)	7 (11,3%)
Rp.2,5 juta- 3 juta (n,%)	2 (7,7%)	3(4,8%)
Above Rp.3 juta (n,%)	-	1 (1,6)
Religion		
Islam (n,%)	40 (9768%)	78 (97,5%)
Christian	1(2,4 %)	1(1,3 %)
Hindu	-	1(1,3%)
Marriage Status		
Singletons (n,%)	19 (46,3%)	49 (61,3%)
Marriage (n,%)	18 (43,9%)	30 (37,5%)
Divorced living (n,%)	3 (7,3%)	1 (1,3%)
Divorced death (n,%)	1 (2,4%)	-
Knowledge about HIV/AIDS		
High	38(92,7%)	71(88,8%)
Attitude towards Harm Reduction	13(31,7%)	42(52,5%)
Positive		
	Mean (SD)	
Length in using injecting drugs	9 (3,6)	7 (4,6)
Age, Year	31 (4,4)	30 (4,2)

Analysis of Simple and Multiple Logistic Regression

Table 2 shows the relationship between behavior access of NSP and use of unsterile needles analyzed before [(OR = 1,07 (95% CI 0:49 to 2:31), p = 0.87)] and after adjusted for some possible confounding factors [(OR = 0.69 (95% CI 0:23 to 2:06, p = 0:51)]. Other possible confounders were also explored. The level of education and positive attitudes towards harm reduction (Harm Reduction) among injecting drug users tend to be a protective factor in reducing risky behaviors to share needle and syirnge to other IDUs (Table 2) before and after adjusted the other variables. However, the p value indicates there is weak evidence againts the null hypothesis of no association between education level and attitude towards the reduction of risky behaviors of injecting drug users in non-sterile (Table 2)

Tabel 2 Factors related to IDUs in Using non-sterile injection and syringe

Variables (Outcome Risky behaviour of using non-sterile injection&syringe, 1=Yes 0=No)	Crude Odds Rasio/OR(95%CI)	P value	Adjusted Odds Rasio(95%CI)	P value
Education(<Junior high school, as reference category)	0.84(0.43-1.65)	0.61	0.61(0.34-1.1)	0.10
Income (< Rp 1 juta, as reference category)	1.57(0.99-2.48)	0.06	1.58(0.96-2.57)	0.07
Age(year)	1.04(0.95-1.13)	0.41	0.92(0.79-1.07)	0.27
Duration of Injecting drugs(year)	1.14(1.04-1.25)	0.005	1.21(1.05-1.41)	0.01
Knowledge (0=less, 1=high)	1.61(0.41-6.29)	0.50	1.11(0.21-5.86)	0.90
Attitude(1=negative, 2=positive)	0.42(0.19-0.93)	0.03	0.55(0.20-1.55)	0.26
Access of Needle and Syringe Program(0=No, 1=Yes) *	1.07(0.49-2.31)	0.87	0.69(0.23-2.06)	0.51

*Adjusted by education, income, age, duration of drug injecting, knowledge, and attitude.

DISCUSSION

The research' findings is there is no association between access of NSP and risk behaviors of IDUs in the use of unsterile needles. IDUs who access NSP, either through the Health Center or the Community Outreach team, increasing the odds of the behavior of IDUs in the use of unsterile needles. In population, IDUs who access NSP can reduce risky behaviors of injecting drug users are not sterile and also increase risky behaviors of injecting drug users in non-sterile ((OR = 1:07 (95% CI 0:49 to 2:31), p = 0.87)). P value indicates that there is weak evidence to reject the nul hypothesis of no relationship between IDU access to NSP and behavior using non-sterile needles. In other words, the primary relationship between the status of IDUs as participants NSP and behavior of IDUs in the use of unsterile needles in the past 1 year did not show a strong association. Power to detect the association is very low because the samples are still few in number in this study. After associatoin between behaviours of NSP access and risky behavior is adjusted by variable confounding, Odds ratio was 0.69 (95% CI 0:23 to 2:06, p = 0:51). Odds ratios showed that IDUs who NSP access, could reduce the risk behaviors of IDUs in the use of unsterilized needles in the past 1 year. Although the p value indicates the less evidence to reject the null hypothesis (Table 2).

These findings are in contrast to previous research findings. Generally, previous research shows that NSP access among IDUs can be reduced risky behaviours of IDUs in sharing needle and syringe in many countries, therefore the HIV epidemic could be reduced (AHRN & CHR Burnet Institute, 2003). Gibson, David R et al (2001) identified 42 published studies on the effectiveness of NSPs from 1989 until akhri 1999. Generally, 28 of the 42 studies found a positive effect, 2 studies showed a negative relationship and 14 other studies showed no association between NSPs and the prevention of the spread of HIV or a combination of positive and negative effects. In the cohort design, 3 of 7 cohort studies in New York (USA) (1996), and Portland (USA) (1995) indicate positive results in HIV prevention. Users NSPs tend to stop using the drug, reduces the use of needles together, and more frequent wash before reuse syringes (8). On the other hand, 4 of 7 studies in Amsterdam (Netherlands) (1996), Montreal, Canada (1997), Seattle (USA) (1999), Vancouver (Canada) (1999) concluded that NSPs did not prevent the spread of HIV(8) . Wodak A & Cooney A (9) in the systematic review concluded that most evidence suggests that by increasing the availability, easy access and awareness on the prevention of HIV and the use of syringes and other sterile injecting equipment to reduce HIV infection substantially.

Research by the negative effects of NSP also found in the United States, Canada and Amsterdam for free access sterile needles at the pharmacy stores / Pharmacies. Location NSP also usually located in the center of IDUs, so that this condition is probably most IDUs had a high risk of contracting HIV before attending the NSP. Results are expressed negative effects of NSPs in this research is more likely influenced confounding factors too. IDUs can buy new syringes through pharmacy stores in Palembang, South Sumatra.

Limitations of this research is the retrospective method in case control study design, exposure information is limited and open opportunities for bias. Then, the control group who simply quite difficult to obtain. To solve this limitation, researchers have trained surveyors' team and used standardized questionnaier. Furhtermore, this design can measure multiple exposures at the same time, rapid method, research can be conducted with a sample size that is not too large.

Then, this research data can also be used as a research base for advanced research design and sample size is statistically significant.

CONCLUSIONS AND SUGGESTIONS

HIV / AIDS has become a problem internationally. One effective method in the spread of HIV / AIDS is through the use of needles together in injecting drug users (IDUs). Needle and Syringe Program has been applied in Palembang city since 2009. Research found that IDUs tend to reduce risky behavior in the use of needles and syringe together or using non-sterile needles in the drug for IDUs with NSP access. But statistically, there is no power to find significant relationships between IDUs behaviours to NSP access and risky behavior in the use of unsterile needles. Free access to sterile needles through drug store or pharmacy that is free in the city of Palembang, allowing as one reason for that, the existence of NSP not really affect the behavior of IDUs in the use of sterile needles.

Although, the presence NSP showed no significant change in the behavior of IDUs use sterile syringes, further research is needed with a larger sample to detect the significance of the relationship between these variables. Qualitative research is needed to be conducted to find deep information about the effect of NSPs towards IDUs behaviors in reducing their risky behaviours.

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REFERENCES

1. WHO. HIV Burden. Journal [serial on the Internet]. 2008 Date: Available from: http://www.searo.who.int/LinkFiles/CDS_Factsheet_WAD2008.pdf.
2. WHO. HIV/AIDS Journal [serial on the Internet]. 2008 Date: Available from: http://www.who.int/features/qa/71/en/print.html.
3. UNODC. Injecting Drug Use. Journal [serial on the Internet]. 2009 Date: Available from: http://www.unodc.org/unodc/en/hiv-aids/injecting-drug-use.html.
4. National AIDS Commission Republic Indonesia. Country report on the Follow up to the declaration of commitment on HIV/AIDS. Jakarta: National AIDS Commission Republic Indonesia; 2007 Contract No.: Document Number|.
5. Departemen Kesehatan RI, Badan Pusat Statistik (BPS), US Agency for International Development (USAID), Komisi Penanggulangan AIDS (KPA), Familiy Health International-Program Aksi Stop AIDS (ASA). Surveilans Terpadu-Biologis Perilaku (STBP) pada kelompok beresiko tinggi di Indonesia, 2007. Jakarta; 2007 Contract No.: Document Number|.
6. Pisani E. Sexual behavior among injection drug users in 3 indonesian cities carries a high potential for HIV spread to noninjectors. J Acquir Immune Defic Syndr. 2003;34(4):403-6.
7. Commission PA. Estimated number of High Risk Group of HIV/AIDS. Palembang: Palembang Aids Commission; 2010 Contract No.: Document Number|.
8. Gibson DR. Effectiveness of syringe exchange programs in reducing HIV risk behavior and HIV seroconversion among injecting drug users. AIDS. 2001;15(11):1329-41.
9. Wodak A, Cooney A. Do Needle Syringe Programs Reduce HIV Infection Among Injecting Drug Users: A Comprehensive Review of the International Evidence. Substance Use & Misuse. 2006;41(6-7):777-813.