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Standard precaution adherence among clinical medical students in HIV and non-HIV ward in Indonesia

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Abstract:

INTRODUCTION: Health-care workers, especially medical intern, are at risk of exposed to blood and other body fluids in the course of their work. To reduce the risk, standard precaution (SP) is introduced. Among all communicable diseases that could be transmitted, human immunodeficiency virus (HIV) is the most stigmatized disease. However, there are some government hospitals that separated adult HIV patients with other patients to prevent additional infection. This study aims to evaluate the impact of ward separation on SP adherence.

MATERIALS AND METHODS: This was an observational study conducted in March 2017 in a tertiary referral hospital for the eastern part of Indonesia. The participants were 150 medical students who underwent the past year of their clinical rotation. They were given a three-part questionnaire, consisting of their background, their SP practice in the HIV ward and non-HIV wards, and their perception and attitude regarding SP. McNemar's test and Fisher's exact test were used for the statistical analysis, using SPSS version 23.0 for Windows.

RESULTS: Participants were more adhered to SP (hand hygiene, wear mask as indicated, and wear glove as indicated) in the HIV ward compare to non-HIV wards ($P = 0.002$, $P = 0.001$, and $P = 0.001$, respectively). Almost all participants were more careful in implementing SP in the HIV ward than in non-HIV wards and were more concerned of getting needlestick injury in the HIV ward than in non-HIV ward.

CONCLUSION: HIV and non-HIV ward separation negatively impact medical students' SP adherence.

Keywords:

Human immunodeficiency virus, medical students, social stigma, universal precautions

Introduction

Health-care workers (HCW) are exposed to blood and other body fluids in the course of their work. Consequently, they are at risk of infection with blood-borne viruses (BBV) including but not limited to human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV). Occupational exposure to BBV may result from percutaneous injury, mucocutaneous injury, or contact with nonintact skin.^[1]

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Standard precaution (SP) is designed to reduce the risk of transmission of blood-borne and other pathogens from both recognized and unrecognized sources. SP is a combination of major features from universal precaution that was introduced in 1985 and body substance isolation that was introduced in 1987.^[2] Aside from protecting the HCW, SP is also intended to prevent the spread of infection from patient to patient. According to the latest guideline, it is recommended to apply SP for the care of all patients irrespective of their disease status.^[3] In Indonesia, SP is adopted

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into the Infection Prevention and Control Guideline in Healthcare Facility.^[4]

Although the guideline is already available, the compliance of HCW toward SP is relatively low, especially in the developing countries. The previous study in West Ethiopia found that only 12% of HCW always complies with SP.^[5] Another study in Indonesia among HCW in the obstetrics and gynecology department of a teaching hospital found that 95% of the respondents have a low adherence toward precaution standards.^[6] Among the HCW, medical interns are at great risk of occupational exposure because they are at a very early stage of their professional career, taking the maximum load of providing medical care in the in-patient and out-patient departments.^[7]

Among the listed possible occupational exposures, HIV is the most stigmatized disease, although the infection rate is lower than hepatitis B and hepatitis C. The seroconversion rate of HIV is 0.3% compared to 30% for HBV and 10% for HCV.^[8] Famoroti *et al.* found that stigmatizing attitudes of HCW to HIV patients is prevalent, although they have good knowledge/training.^[9] In Indonesia, previous studies found that HIV-related stigma among HCW is high.^[10,11] Even though the stigma is high, there are some government hospitals that separates adult HIV patients with other patients in a different ward with the purpose of preventing additional opportunistic infections for HIV patients.

This study aims to evaluate the impact of ward separation on SP adherence. We hypothesized that the SP adherence is higher in the HIV ward compared to non-HIV wards because of the exaggerated fear of HIV infection resulting from the stigma.

Materials and Methods

This study was an observational study conducted in March 2017. This study followed the principles of the Declaration of Helsinki. Ethical clearance from the Institutional Review Board had been obtained before the study began (Ethical clearance number: 375/Panke/KKE/V/2016). All participants gave their informed consent prior to their inclusion in the study. Information for informed consent was given before the participants signed the informed consent. Details that might disclose the identity of the participants were omitted. This study was conducted at tertiary level teaching and referral hospital, which act as the referral center for all hospitals in the eastern part of Indonesia. This study follows the STROBE guideline.

Participants of this study were medical students in their last clinical year. These students had worked in both HIV

and non-HIV wards throughout their clinical years. This study used a population survey method, and the required sample size was calculated using EpiInfo™.^[12] Based on the calculation, from 246 final year clinical medical students, 150 students were needed to participate in the study. Participants were recruited with a simple random sampling. The instrument in this study was a three-part self-administered questionnaire. The first section assessed participants' background, the second section assessed their SP's implementation at both HIV and non-HIV ward, and the last section assessed their perception about SP.

The questionnaire data entry and analysis were performed using IBM SPSS Statistic for Windows version 23.0 (Armonk, NY: IBM Corp.). All necessary differences and errors were rectified before the processing. All variables presented were coded with numerical values. The data were then processed into tables to show the frequencies and percentages of the distribution. McNemar's test and Fisher's exact test were used for the statistical analysis in this study. The $P < 0.05$ was considered statistically significant.

Results

Of 150 last year medical students participated in this study, the average age was 23 years old. There were more female participants (57.3%) in this study. The majority of the participant had a grade point average between 3.0 and 3.5 out of 4.0. Based on the family background, the ratio between participants from the HCW family and the non-HCW family was 1:2 [Table 1].

In daily practices, almost all participants always implement hand hygiene in both wards. The adherence to wearing masks and gloves, as indicated in the HIV ward, was higher than in the non-HIV ward. The comparison between SP practices in HIV and non-HIV ward was all statistically significant (all $P < 0.05$) [Table 2]. There was no significant difference in SP practices in both wards between participants with a family background of HCW and non-HCW (all $P < 0.05$) [Table 3].

Table 1: Characteristics of study participants

Characteristics	n=150
Age (years), mean±SD	23.23 ± 0.734
Gender, n (%)	
Male	64 (42.7)
Female	86 (57.3)
Grade point average, n (%)	
2.5-3.0	5 (3.3)
3.0-3.5	122 (81.4)
>3.5	23 (15.3)
Family background, n (%)	
From health-care worker family	50 (33.3)
From nonhealth-care worker family	100 (66.7)

SD=Standard deviation

There were 57 participants (38%) who felt safer in non-HIV wards, although they already implement the SP. Around 20% of the participants did not believe that SP can protect them from infection. Almost all participants were more afraid of getting needlestick injury in the HIV ward than in non-HIV wards. Other than that, almost all participants were also more concerned of getting needlestick injury in the HIV ward than in non-HIV wards [Figure 1]. No significant difference in SP perception was found between participants either from a family background of HCW or non-HCW (all $P > 0.05$) [Table 4].

Discussion

There were significant differences regarding SP practices among medical students between the HIV and non-HIV ward. It is suggested that the implementation of SP is proportionate to the fear of infection. Moreover, the

negative stigma of HIV would also affect the quality of health-care provided.^[13] Previous studies in Indonesia regarding HIV stigma among HCW discovered that the level of stigma is high.^[10,11] Thus, this discrepancy may be caused by the exaggerated fear of infection among medical students.

Another possible factor that may affect SP practice is the knowledge of health-care providers.^[7,14] The incomplete understanding of SP is identified as a hindrance to proper SP implementation.^[15] On the contrary, higher knowledge regarding HIV does not always correlate to less stigma toward patients with HIV.^[11,16] This suggests that education regarding HIV to health-care providers would not always result in better SP compliance. Other than that, although the HCW had more knowledge regarding SP, it did not guarantee higher SP practice among them.^[14] However, the authors did not evaluate the medical students' knowledge of SP in the present study.

Table 2: Comparison of standard precaution practices between in HIV and non-HIV ward

Standard precaution practices	In HIV Ward (n=150), n (%)	In non-HIV Ward (n=150), n (%)	P
Always practice hand hygiene as indicated	145 (96.67)	135 (90)	0.002
Always wear a mask as indicated	125 (83.33)	52 (35)	0.001
Always wear gloves as indicated	83 (55.33)	37 (24.67)	0.001

McNemar's test was used. $P < 0.05$ was considered statistically significant. HIV=Human immunodeficiency virus

Table 3: Comparison of standard precaution practices between at HIV and non-HIV ward among different family background

Standard precaution practices	In HIV ward		P	In non-HIV ward		P
	Health-care worker (n=50), n (%)	Nonhealth-care worker (n=100), n (%)		Health-care worker (n=50), n (%)	Nonhealth-care worker (n=100), n (%)	
Always practice hand hygiene as indicated	47 (98)	98 (98)	0.334	45 (90)	90 (90)	1.00
Always wear a mask as indicated	41 (82)	84 (84)	0.818	20 (40)	32 (32)	0.366
Always wear gloves as indicated	30 (60)	53 (53)	0.487	16 (32)	21 (21)	0.162

Fisher's exact test was used. $P < 0.05$ was considered statistically significant. HIV=Human immunodeficiency virus

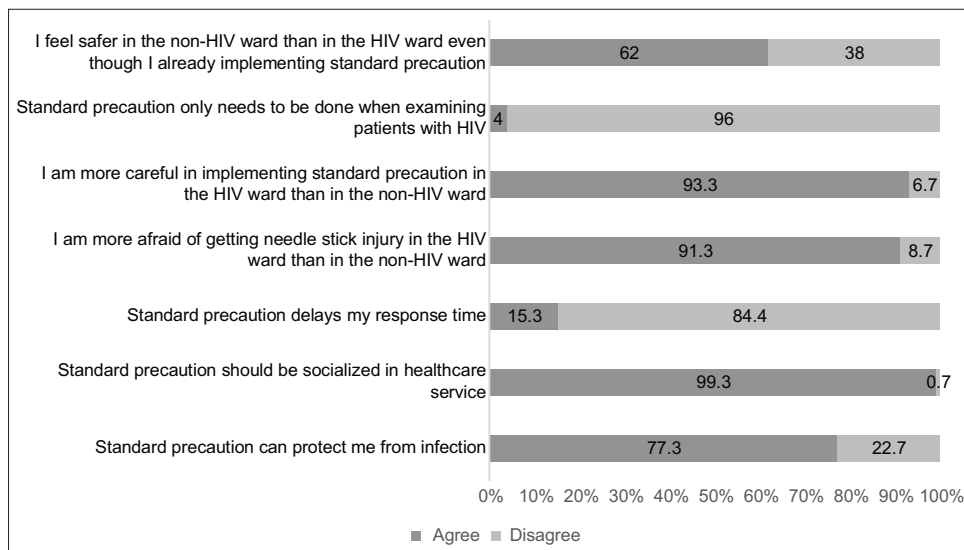


Figure 1: Medical students' perception and attitude regarding standard precaution

Table 4: Comparison of medical students' perception and attitude regarding standard precaution among different family background

Standard precaution perception	Healthcare worker (n=50), n (%)	Nonhealthcare worker (n=100), n (%)	P
I feel safer in the non-HIV ward than in the HIV ward even though I already implementing standard precaution	34 (68)	59 (59)	0.372
Standard precaution only needs to be done when examining patients with HIV	3 (6)	3 (3)	0.401
I am more careful in implementing standard precaution in the HIV ward than in the non-HIV ward	49 (98)	91 (91)	0.166
I am more afraid of getting needlestick injury in the HIV ward than in the non-HIV ward	48 (96)	89 (89)	0.221
Standard precaution delays my response time	8 (16)	15 (15)	1.00
Standard precaution should be socialized in health-care service	49 (98)	100 (100)	0.33
Standard precaution can protect me from infection	36 (72)	80 (80)	0.304

Fisher's exact test was used. $P < 0.05$ was considered statistically significant. HIV=Human immunodeficiency virus

The present study found no difference in the SP practice between the medical students from the HCW family and the non-HCW family. In this study, the HCW family background was defined as having at least one parent who works in the health-care sector (doctor, nurse, or midwife). The effect of higher education has been already elaborated in the previous study by Li *et al.*, where higher education level was significantly associated with lower stigma attitude.^[17] However, the impact of family background to SP adherence or to stigmatizing attitude is not yet elucidated in any study.

The previous study found that reluctance to care for patients with HIV was positively associated with prejudicial attitudes and negatively associated with confidence in personal safety precautions.^[18] In this study, we found that there was a discrepancy between their attitudes in their practices. The confidence of the medical students in this study regarding their SP practice is questionable as 62% still felt safer while working in the non-HIV ward. Although we did not directly evaluate the fear among the medical students, 91.33% of them were more afraid of getting needlestick injury in the HIV ward. The discrepancy in this study could be caused by the projection of that fear to more fervent SP practice in the HIV ward. This was reflected by the fact that 93.33% of them practiced more meticulous SP in the HIV ward. The other reason behind low adherence to SP has been described. The heavier workload and the discomfort of protective equipment have been identified as obstacles to SP implementation.^[19] However, most of the respondents in this study agreed that the SP would not delay their response time.

Haile *et al.* discovered that prior training and management support is an important determinant of SP practice. In their study, the prior training increased the SP compliance by almost 3 times, and the management support increased it by more than 2 times.^[5] In the studied hospital, medical students did not receive any SP training prior to their rotation at the hospital. Moreover, medical students' SP practice is rarely supervised because of the high workload.

In this study, the authors did not directly observe the SP practice among medical students but relied on self-reported practice. The previous study has already shown that actual SP practice adherence was significantly lower than the self-reported one.^[20] Therefore, our study design could be considered as the weakness of this study as it might not really describe the SP adherence on daily basis practice. However, considering that even in self-reported practice showed a significant difference between SP adherence in HIV and non-HIV wards, we argued that the difference on a daily basis was even greater.

To the best of our knowledge, this is the first study in Indonesia which evaluate the impact of ward separation between HIV and non-HIV patients on SP adherence. However, there are still some limitations in our study. SP knowledge and the magnitude of HIV stigma of study participants were not evaluated in this study. Other than that, other aspects such as prior training and supervision to the medical students were also not evaluated. Nevertheless, this study is important to give a perspective for the policymaker regarding the negative effect of ward separation to SP adherence.

Conclusion

HIV and non-HIV ward separation negatively impacts medical students' SP adherence, regardless of their family background. We recommend the policymaker to re-evaluate the policy of wards separation between HIV patients and non-HIV patients in Indonesia.

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Conflicts of interest

There are no conflicts of interest.

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