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Factors Associated with the Reporting of Incidents of Needlestick Injuries and Body Fluids Exposure among Clinical-Year Medical Students: A Cross-Sectional Analytical Study Performed at Siriraj Hospital

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Abstract

Introduction: Several studies and observational reports have highlighted the widespread underreporting of healthcare-associated injuries among healthcare personnel, especially medical students. Such underreporting can mask substandard medical practice and can lead to adverse complications if the injuries are not treated. The present study aimed to explore the reasons for the reporting and the factors associated with the non-reporting of needlestick injuries (NSIs) or exposure to a patient's body substances among medical students in clinical practice.

Method: Convenience-based sampling was used to collect data from medical student groups for a clinical research study. Questionnaires were distributed to 554 medical students studying at the clinical level in the Faculty of Medicine, Siriraj Hospital. The student responses were statistically analyzed via the frequency and percentages of the answers, as well as by chi-square test and Fisher's exact test.

Results: Overall, 401 (72.38%) medical students completed and returned the questionnaire, comprising 192 (47.9%) male and 209 (52.1%) female students. Among these, 135 medical students in the 6th year of study stated they had experienced NSI (53%) or exposure to patients' body substances (47%), although only 61% had reported such incidents. The most significant factor associated with the reporting of incidents was anxiousness about being infected (56.6%, p=0.02); while the injury type was the factor most associated with the non-reporting of incidents, especially when the injury was not considered serious and the risk of contagion was considered low (63.5%).

Conclusion: The most important factor associated with the reporting or non-reporting of incidents was medical students' concern about being infected from an incident. This reasoning though is inappropriate for monitoring medical practice. Safety guidelines for the management of injuries during medical practice need to be implemented and clarified for all medical students to ensure they are adhered to and that incidents are properly reported and managed. Further study should be carried out after implementing the guidelines for monitoring their effectiveness.

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Introduction

Healthcare workers are at a high risk of infection from exposure to patients, especially diseases transmitted via blood or secretions. One of the most common causes of disease transmission is through sharp instrument injuries, called needlestick injuries (NSIs). According to a survey conducted at Siriraj Hospital between 2013–2015 (2556–2558 BE), medical students inexperienced in clinical practice accounted for 12.9% of the total incidents reported. Schmid, Schwager, & Drexler (2007) reported that among 787 medical students, doctors, and nurses surveyed, the incidence of injury from sharp objects or patient secretions was 24.14%, of which 64.29% of the group did a follow-up blood test later and 17% were found to be infected with hepatitis C, 4% hepatitis B, 2% HIV, and 1% with all three types. Tengsujaritkul (2014) reported that inexperienced medical students accounted for 34.7% of all people involved in incidents and 52.6% of those who actually reported an incident. The main reasons for reporting such incidents were stated as: a fear of infection (31.9%), not knowing the blood results (23.6%), and noticing that a patient's blood was anti-HIV or HBsAg. Moreover, the study claimed that the reasons for not reporting incidents were: thinking that the injuries were not critical or did not have a high risk of infection (33.8%), knowing the result of the patient's blood and that is was not anti-HIV or HBsAg (24.8%), or thinking that the process of reporting is too complex and it takes too much time to report (24%). In conclusion, the results of that study indicated that the reporting of incidents was less than should be expected.

However, although the incidence of injuries from sharp objects and exposure to patient secretions is high, there remain many students and medical practitioners who do not report such incidents

The present study aimed to identify the factors affecting the submission of reports about such incidents in order to properly understand and manage the problem of potential underreporting, and to promote a greater awareness about the importance of reporting such injury incidences among medial students.

Objectives

To explore the reasons for the reporting and the factors associated with the non-reporting of needlestick injuries (NSIs) or exposure to a patient's body substances among medical students in clinical practice.

Conceptual framework

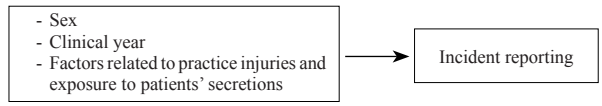

Figure 1 Conceptual framework

Research methodology

This study involved cross-sectional descriptive research carried out within the Faculty of Medicine, Siriraj Hospital, 2016 (2559 BE), and was certified by the Institutional Review Board (IRB; COA no. Si 724/2016). A questionnaire was used for data collection consisting of two parts that addressed basic information about the medical students (4 questions) and the factors that influence their decision to report or not report medical practice injuries and exposure to patients' secretions (16 questions). The whole questionnaire had an The Index of Item-Objective Congruence (IOC) of 0.64.

Random sample for convenient access: distribution of questionnaires to medical student clinicians in hospitals.

The exclusion criterion was based on the completeness of the questionnaire responses by the medical students: If the respondents had answered less than 80% of the total number of questions, the questionnaire was considered incomplete and the questionnaire was fully removed from the data analysis.

Statistical analysis

The key statistics were:

1. The frequency and percentage of basic information appearing in the sampling, including gender and level of education of the medical students.

2. Analysis of the statistical information using the chi-square test and Fisher's Exact test.

Results

The total number of medical students who had experienced injuries from sharp items or from exposure to patients' body fluids during the operation recovery process was 401 cases from 554 study participants, representing 72.38% of the entire sample. We used these cases in the further analysis.

The sample cohort here consisted of 192 male and 209 female medical students in years 4 to 6 of their education. Most of the medical students (92.27%) knew that the faculty had an incidence reporting system, and 66.34% of the medical students had never experienced

such an incidence. The analysis results are shown in Table 1.

Table 1 Basic characteristics of the study participants

Basic information	n	Percent
1. Sex		
male	192	47.88
female	209	52.12
2. Clinical year		
year 4	152	37.91
year 5	158	39.40
year 6	91	22.69
3. Do you know there is a reporting system regarding sharp instrument injuries?		
Yes	370	92.27
No	31	7.73
4. Within the past 1 year, have you experienced such an incident?		
never	266	66.34
less than 3 times	124	30.92
3 times or more	11	2.74
5. The departments of Siriraj Hospital showing the highest frequency of reported incidents		
Medicine	172	42.96
Obstetrics & Gynecology	98	24.44
Surgery	54	13.56
Other	77	19.04

The results of the further analysis showed that the frequency of medical students getting injured from sharp items or through exposure to patients' body fluids was 33.67% and the frequency of the reporting of such incidents was 61.48%.

The clinical settings of Siriraj Hospital showing the highest frequency of reported incidents were Medicine (42.96%), followed by Obstetrics & Gynecology (24.44%) and Surgery (13.56%).

The primary processes that medical students followed after getting an injury were cleaning the injury with an anti-septic solution (33.17%) or soap (27.23%) (Table 2).

Table 2 Reasons for pursuing the reporting process for injury incidents

Reasons	First reason (n)	Second reason (n)	Third reason (n)
aware of serious subsequent infection	47	5	2
unknown patient blood test	17	27	8
following the regular process	12	11	15
suggested by other medical workers	3	5	12
others	3	1	0
contact with patients with a positive blood test	1	8	1
total	83	57	38

Table 2 shows the reasons for the medical students reporting such incidents, where it can be seen that the main reason most medical students chose to report an incident was a fear of a serious infection.

Also, 53.01% of the medical students who decided to report an incident informed the doctor who had responsibility in order to make them aware of the incident and to seek help. Moreover, the research showed that the top three consecutive rankings of the reasons for the medical students to think that they have to report such incidents are a fear of a critical infection, not knowing the results of the patient's blood, and a desire to follow the rules about reporting incidents (Table 3). On the other hand, the medical students who did not report such incidents thought that the injury was not a critical injury or did not involve a high risk of infection or they already knew the result of the patient's blood and knew that it was not anti-HIV or HBsAg (Table 4).

Table 3 Reasons for not reporting injury incidents

Reasons why not	First reason (n)	Second reason (n)	Third reason (n)
a unaware of the adversity	33	8	1
exposed to patients with negative blood test	11	7	1
others	4	1	0
lack of knowledge of the reporting process	3	2	2
do not know to whom should be reported	1	3	5
highly time-consuming reporting process	0	3	4
thought to be previously immunized	0	2	2
Total	52	26	15

Table 3 shows the reasons for not reporting such incidents, where it can be seen that the main reason most medical students chose not to report an incident was that they did not think it was serious.

Table 4 Causes of the incidents

Causes of the incidents	n	Percent
unawareness	84	37.84
lack of experience	40	18.02
accidental	22	9.91
drowsiness	16	7.21
hasty situation	16	7.21
others	11	4.95
overanxious	9	4.05
improper placement of instruments	7	3.15
inadequate light	6	2.70
unskilled	6	2.70
overload with patient caseload	3	1.35
instrument deprivation	2	0.90

According to the medical students who reported such incidents, the main reasons leading to the injuries were their own carelessness or incautiousness, a lack of experience, or injuries caused by others (Table 5).

Table 5 Association between the injury mechanism and incident reporting

incident report	needlestick		other instruments		secretion		
	n	Percent	n	Percent	n	Percent	Person chi – square p = 0.044
reported	38	70.37	3	33.33	34	53.12	
not reported	16	29.63	6	66.67	30	46.88	

Table 5 shows that the injury characteristics influenced incident reporting among medical students, with significance at the .05 level.

Table 6 Perceived problems regarding the reporting system

Problems regarding the reporting system	Percent	
	no	yes
the processes are too complex	65.61	34.39
takes too long to take action	48.11	51.89
the office is not practically accessible	49.06	50.94
issue with the staff at the office, who are nurses, on-duty doctors, and OPD staff 447	29.41	70.59

Most clinical-year medical students thought that the reporting system needs to be improved. Some reporting systems may be cumbersome, time-consuming, or reliant on outdated technologies. Medical students often have limited time available and a need to balance patient care, learning, and other responsibilities. An inefficient reporting system can add an unnecessary burden and hinder their ability to provide optimal care and to complete all their study tasks.

Discussion

Of the total 554 questionnaires distributed by our research group, 401 questionnaires (72.38%) were completed and returned. It was revealed that 33.67% of the medical students in their clinical years had experienced sharp instrument injuries and secretion exposure. Compared to the findings of Tengsujaritkul, Mingkwan, Wannakun, Rattanakoses, Thukratok, Hongchoktawee, Phinijsunthorn and Khanato, (2014) whose incidence was 53%, our result is not considered distinctively high. Both our study and Tengsujaritkul et al. (2014)'s study similarly defined "secretion exposure" as contact of a mucous membrane (e.g., eyes, nose, or mouth), non-intact skin, or intact skin with patients' body fluids. Our results approximately accorded with Boondet, Euaboonyanun, Phonrachom, Boonton, & Wongwilai (2006) who reported an incidence of 30%; however, they adopted a slightly different definition of "secretion exposure", defining this as a contact of a mucous membrane (e.g., eyes, nose, or mouth) or non-intact skin with patients' body fluids. If our study had employed their definition, our incidence would have been only 17.78%, which would be considered particularly low. The rate of reporting exposures in the present research was 61.48%, which was much higher than that in Tengsujaritkul et al. (2014)'s study, which was only 34.7%. Variations in the reporting systems might have resulted in the huge difference between the reporting rates in these two studies. Tengsujaritkul et al. (2014) described their reporting system as informing about sharp instrument injuries and secretion exposure to interns, residents, or attending physicians and documenting the events in injury reports. However, it was suggested that a number of reported accidents were not documented in injury reports, based on the judgment of the authorities.

The reasons for reporting such incidents according to the medical students mostly revolved around acquiring infections, e.g., the fear of acquiring a serious infection (56.6%), unknown patient blood counts (20.48%), and the urge to follow protocols (14.46%). Sangniphankul (2006) found that the reasons for reporting incidents were a need to report an incident, the short time it took to report an incident, and an assumption of a high risk of infection, respectively. It was found that medical students in their clinical years were aware of the risk of contracting infectious diseases through injuries with sharp instruments and contact with patients' secretions. The reasons for not reporting incidents were an assumption of non-serious injury (63.46%) and knowledge of the negative blood findings of the patients (21.15%). In conclusion, the main factor that influenced the medical students' decision to report incidents was a concern about infection. Therefore, it is imperative to develop an approach to raise medical students and faculty members awareness about the importance of reporting incidents involving sharps and secretion exposure, regardless of whether they perceive such incidents as high or low risk.

Suggestions

for applying the research results

Medical students and medical personnel should be encouraged to be more careful in performing

procedures. There are strict measures already in place in most institutes but there is a need for a greater emphasis on compliance with those measures and with the principles of infection prevention in hospitals, not just training and education.

for further research

There should be further research studies performed to extend the knowledge of infection prevention with practical implementation while working. This could be in the form of a focus group study or an interview-based study.

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