Original Article

Knowledge, Attitude, And Performance of Operating Room Personnel about Occupational Exposure to Blood-Borne Infections

Farzad Abaszadeh[1], Jamshid Eslami[2*], Leila Bazrafcan[3]

[1] Master student of Surgical Technology, student research committee, Shiraz University of Medical Sciences, Shiraz, Iran.[2] Assistant Professor of Curriculum Planning, Department of Nursing, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran. [3]Ph.D. Assistant Professor Medical Education Depart ment Medical Education Development Center Shiraz University of Medical Sciences, Shiraz, Iran.

Correspondence: Jamshid Eslami, Assistant Professor of Curriculum Planning. Department of Nursing, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran. Email: jamshideslami99@gmail.com

ABSTRACT

Background and Aim: The operating room is one of the intensive areas of a hospital. Operating room personnel are exposed to high levels of exposure to blood and body fluids through occupational exposure. The aim of this study was to evaluate the knowledge, attitude, and performance of operating room personnel about occupational exposure to blood-borne infections. Materials and Methods: This is a descriptive-analytic cross-sectional study. The research population consisted of operating room personnel in Shiraz. The sample size was 198. The sample was selected according to the population of the hospital and the questionnaires were randomly assigned to the sample. Results: The response rate in this study was 100%. The mean and the standard deviation of knowledge score were 6.63 ± 1.38 out of 10, the attitude score was 34.26 ± 7.47 out of 44, the pre-exposure performance score was 13.98 ± 3.86 out of 21, and the post-exposure was 16.21 ± 6.51 out of 30. Conclusion: In this study, although the participants' attitude was reported as optimal, the knowledge and performance were not optimal; therefore, effective education and regular monitoring can help improve the occupational exposure and ultimately reduce the risk of transmission of blood-borne infections.

Keywords: Occupational exposure, Operating room personnel, Blood-borne infections, Knowledge, Attitude, Performance

Introduction

Hospitals are the riskiest health care centers in the health system, and health care workers are considered as the groups at risk of occupational diseases and hazards [1, 2]. The operating room is one of the stressful parts of the hospital which causes stress in the operating room nurses due to work in emergency situations, shift work, specialized equipment, work in closed environments, and high workloads [3].

The operating room personnel is exposed to the high risk of contact with blood and body fluids due to the damage caused by needle stick and sharps and wounds. It is a unique environment for the instrumentation because surgeons and operation technicians have to move the sharp and wicker tools in a small space [4-6].

Approximately 60 blood-borne infectious pathogens have been identified; the three pathogens of HIV, HBV, and HCV cause the most occupational exposures to the blood. In this regard, the relationship among the risk of transmission of hepatitis B (30%), hepatitis C (3%), and AIDS (0/3%) is mentioned [7, 8].

Occupational incidents may have physical, psychological, and social effects for employees and, as a result, cause anxiety, distress, and disturbance in social relationships [9, 10]. In the United States, any needle stick damage, without any infection, costs between $2,234 and $3,832 for health care workers, and in Iran, the cost of tracking needlestick injuries with infected needles is one million Rials [4, 11]. Although standard precautions such as the use of gloves and the proper disposal of needles have been observed well in recent years, the performance of the study population has been reported to be low in the Matthews's study [12]. Occupational exposure is high in health care workers

Access this article online	
Website: www.japer.in	**E-ISSN:** 2249-3379

How to cite this article: Farzad Abaszadeh, Jamshid Eslami, Leila Bazrafcan. Knowledge, attitude, and performance of operating room personnel about occupational exposure to blood-borne infections. J Adv Pharm Edu Res 2020;10(S1):157-161.
Source of Support: Nil, Conflict of Interest: None declared.

and the average occupational exposure in health care workers worldwide is estimated 0.2-4.7% annually. In the EU, the occupational exposure per 100 hospital occupied beds is about 12-30 beds, and in Iran, surveys also show that more than 50% of nurses have occupational exposure. However, it should be added that about 20-90% of exposure cases are not reported in the world [13-17]. The main mission of nursing education is to educate them to become competent and skillful. The nurses should have knowledge, attitude, and performance, all being necessary to maintain and improve the health of the community, and playing an important role in providing the health of the individual and ultimately the society. Nowadays, more than ever, occupational and professional health in hospital and medical settings requires the implementation of very comprehensive approaches to assessing the health care needs of the employees [18, 19]. The hospital environment is laden with a variety of risks, including infectious diseases which put many risks on the personnel, and it is expected that the subjects of knowledge, attitude, and performance will be integrated into the personnel in the form of clinical capacity [19]. Considering the high prevalence of occupational injury among the medical staff, especially the operating room personnel, the fact that many costs are imposed annually on individuals and society due to these injuries, and this issue has been less attended in other studies, the aim of this study was to determine the knowledge, attitude and practice of operating room personnel about occupational exposure to blood-borne infections in hospitals affiliated to Shiraz University of Medical Sciences in 2019 in order to provide information needed for prevention of blood-borne infections and reduce costs.

Materials and methods:

The present study is a descriptive-analytic cross-sectional study on the knowledge, attitude, and performance of operating room personnel about occupational exposure to blood-borne infections in Shiraz University of Medical Sciences affiliated hospitals. The data were gathered in the year 2019. The research setting was the operating room of hospitals affiliated to Shiraz University of Medical Sciences (Namazi, Shahid Faghihi, Shahid Chamran, Shahid Rajaee, Hazrat Zeinab, Shooshtari and Amiral-Mo'menin). The sample size was determined according to Stephen et al., with the knowledge of p=80 %, d = 5% and a confidence level of 95% for 198 persons [20]. The inclusion criteria were a willingness to participate, work history of more than 6 months, and holding at least an associate degree. The samples were selected according to the population of the hospital, and the questionnaire was randomly assigned to the samples and collected after completion. A four-part questionnaire was used to collect the data. The first part consisted of 7 questions about personal information. The second part of the questionnaire included 10 questions on familiarizing the staff and its measurement criteria, the number of answers, yes, no, and I do not know. The third part of the questionnaire consisted of 11 questions, which examined the attitudes of the staff. The benchmark for measuring this is based on the totally agreeable responses, agree, do not comment, oppose, and completely disagree. The fourth part of the questionnaire, with 17 questions, looked at the performance of the staff, and the measurement criteria were based on the responses at all, sometimes, often and always. It should be noted that in the case of questions on knowledge, for each of the questions, the score was considered to be zero or one. The score zero was given to wrong answers and I do not know answers, and for each correct answer one score was considered; also, for each of the attitude questions, the score given was zero to four, from I totally disagree. For the performance questions, the score ranged from zero to three from never to always. This questionnaire was researched, designed, and used as a tool for assessing the level of knowledge, attitude, and performance of employees in occupational exposure in a study in Kerman University of Medical Sciences by Etesami et al., [21]. The reliability of the questionnaire in Shiraz was confirmed by Cronbach's alpha test, which was confirmed by the index of 0.73. Data were analyzed by SPSS version 24 using descriptive statistics.

Results:

The response rate in this study was 100%. The mean and standard deviation of the samples' age were 31.56 and 6.87, respectively. The mean and standard deviation of the working experience of the research samples were 9.12 and 6.69, respectively. The minimum and maximum age of the research samples were 20 and 60 years, and those of working experience was 1 and 38 years, respectively. Most of the samples were women, married, and official staff, and had a bachelor degree.

The results of this study showed that the mean and standard deviation of knowledge score were 6.63 ± 1.38 out of 10; the attitude score was 34.26 ± 7.47 out of 44; the pre-exposure performance score was 13.98 ± 3.86 out of 21, and the post-exposure function was 16.21 ± 6.51 out of 30. (Table 1)

Finally, the scales of knowledge, attitude, and performance were calculated as percentages between 0-100, and the score of more than 75% from each one was considered as the desired level of the knowledge, attitude, and performance. It was concluded that 140 (70.7%) employees did not have a good level of knowledge and only 58 of them (29.3%) had a good level of awareness. Also, the results showed that there was a significant difference between the mean scores of knowledge between men and women (p = 0.006). The results showed that the mean scores of knowledge did not have a statistically significant difference between different levels of education, different types of employment, marital status, age, and work experience. The attitudes showed that 104 of them (52.5%) had a favorable attitude and 94 (47.5%) did not. The results showed that the mean scores of attitude did not have a statistically significant difference between different levels of education, different types of employment, marital status, age, gender and work experience.

In the pre-operative performance section, it was found that 123 subjects (62.1%) did not perform well and only 75 of them

(37.9%) had a good performance. The results showed that the performance means scores before exposure was not statistically significant between gender, different levels of education, different types of employment and marital status. After age grouping, in the three groups, the results showed that there was a significant difference in the performance scores before exposure between the three age groups (p = 0.014). Also, after grouping the work experience into three groups, the results showed that there was a significant difference in the performance scores before the exposure in the three groups (p = 0.004).

In the post-exposure performance, it was found that only 26 participants (20.3%) of the post-exposure performance had a desirable level and 102 subjects (79.7%) did not perform well. The results showed that the mean scores of post-exposure performance did not have a significant difference between sexes, different levels of education, different types of employment, marital status, age, and work experience.

A correlation test between variables was used to examine the relationship between knowledge, attitude, and performance. The results showed that there was a weak relationship between knowledge and attitude and this relationship was not statistically significant (p=0/85). There was a significant relationship between knowledge and performance before exposure, which was statistically significant (p = 0.001). There was a weak relationship between knowledge and performance after exposure and between attitude and performance before and after exposure; also, these relationships were not statistically significant. There was a relatively high correlation between pre-exposure and post-exposure performance, which was statistically significant (p = 0.00). (Table 2)

The results also showed that 80.7% (159 people) of the subjects had occupational-related education, and 63 (39.6%) of them were men and 96 (60.4%) were women; this difference was not significant in the gender variable (significance level = 145/0).

Table 1 - Mean and the standard deviation of knowledge, attitude and practice score

Variable	minimum	Maximum	mean	Standard deviation
Awareness	3	10	6.63	1.38
Attitude	18	44	34.26	7.47
Pre-exposure function	3	21	13.98	3.86
After-exposure performance	4	30	16.21	6.51

Table 2: Correlation between knowledge, attitude, and performance

Variable	Awareness	Attitude	Pre-exposure function	after-exposure function
Awareness				
Relationship	1	-0.01	0.23	0.15
Significance level		0.85	0.001	0.08
Attitude				
Relationship	-0.01	1	-0.07	-0.13
Significance level	0.85		0.32	0.12
Pre-exposure function				
Relationship	0.23	-0.07	1	0.47
Significance level	0.001	0.32		0.00
after-exposure function				
Relationship	0.15	-0.13	0.47	1
Significance level	0.08	0.12	0.00	

Discussion:

The aim of this study was to assess the knowledge, attitude, and performance of operating room personnel about occupational exposure to blood-borne infections, which was carried out in hospitals affiliated to Shiraz University of Medical Sciences. The result showed that the attitude of individuals in this study was desirable, but knowledge and performance before and after exposure were not.

In the study of Soltanian et al. (2013) in Hamedan, the results of the study showed that the student's knowledge about PEP (post-exposure prevention) was weak, and although their attitude toward the subject was positive, their attitude had not affected their performance. This is in the same line with our result on performance [22].

The study of Abdullah et al. in Ethiopia (2016) concluded that most of the participants had enough knowledge and their attitude toward this issue was positive. Compared to our study, the awareness was the same and the attitude was different [23].

The study conducted byVasiw (2016) in Nigeria aimed at investigating knowledge, attitude, and performance of the health system staff in the prevention of post-exposure blood-borne infections; it was concluded that 81% of the knowledge was adequate and 70% had a desirable function. This result is similar to that of our study. On the other hand, it was shown in this study that approximately 50% of people had an appropriate attitude, which is consistent with our conclusion [24].

These differences can be explained by the fact that, at first, other studies had not used a specific tool and their sample size was also different, so the score of knowledge, attitude, and performance obtained in each study cannot be comparable. On the other hand, in the present study, the attending group was only operating room staff, while similar studies had been conducted on various occupational categories such as physicians, nurses, students, etc.

In this study, despite the positive attitude of the employees towards the prevention of occupational exposure to blood-borne infections, there was a lack of knowledge and performance. In Simber et al.'s study on knowledge, attitude and performance of midwives on the prevention of AIDS in selected hospitals in Isfahan, it was also shown that they had good knowledge, positive attitude and moderate performance in relation to the principles of prevention of HIV/AIDS [25].

This confirms the fact that the existing training is not sufficient or does not lead to behavior and performance, both of which are particularly hazardous at the university's educational hospitals, as different educational groups such as surgeons, anesthesiologists and students of different groups in the

educational environment are affected by their wrong or right habits; therefore, new and applied educational interventions should be introduced to increase knowledge and change the behavior of the operating room staff. Other studies also emphasize this point [26, 27].

By using the results of this study, the authorities of medical education at the University of Medical Sciences should be informed of the results of this low awareness and inappropriate behavior towards blood-borne diseases. Also, university and hospital education deputies will offer adequate and effective training for all levels because effective education and regular monitoring can help improve occupational exposure and ultimately reduce the risk of transmission of blood-borne infections.

Also, the reason for the fact that attitudes do not lead to good performance should be studied in later studies; despite the good attitude, the knowledge is not enough, and there might be a lack of communication that can be effective.

Conclusion:

This study showed that many participants were trained in occupational exposure management, but awareness and performance were not reported to be desirable. Implementing intervention strategies designed with effective education and regular monitoring can help improve occupational exposure and ultimately reduce the risk of transmitting blood-borne infections. The hospital system should have facilities for implementing the occupational exposure management guidelines, including a written protocol for rapid reporting, assessing, counseling, treating, and follow up of occupational exposure. Supportive measures such as improving the injection methods, modifying the work plans, planning training programs for the use of personal protective equipment, and providing a significant number of safety features such as protective glasses and gloves to avoid exposure to occupational exposure should be taken.

Study Limitations:

As to the limitations of this study, the inclusion of students in the operating room, the staff of private hospitals and employees of other sectors in the study could be noted in this study.

Ethical aspects and conflict of interest

The ethics committee of the University has confirmed the performance of the study to number IR.SUM.MED.REC.1397.836. The purpose of this research was explained to respondents.

Personnel announced their satisfaction with the study and their anonymity was guaranteed. The authors stated that they would not benefit from research.

Acknowledgment:

We would like to thank all the staff participating in this study, the deputy of the research committee at Shiraz University of Medical Sciences , the director of the Center for the Development of Clinical Research on the Namazi Hospital, doctor Poorahmad, for Entrepreneurs who collaborated in the study. This article is extracted from a thesis on medical education.

This article is based on Farzad Abbaszadeh's thesis on the Layout code number 97-01-08-18194 and has an ethics code number IR.SUM.MED.REC.1397.836.

The authors would like to thank Shiraz University of Medical Sciences, Shiraz, Iran and also Center for Development of Clinical Research of Nemazee Hospital and Dr. Nasrin Shokrpour for editorial assistance.

Author contribution

Concept and design (FA, JM), data collection (FA), data analysis and interpretation (FA, JM, LB), manuscript draft (FA), critical revision of the manuscript (JM, LB), final approval of the manuscript (LB, JM).

References

1. Elseviers MM, Arias-Guillen M, Gorke A, Arens HJ. Sharps injuries amongst healthcare workers: a review of incidence, transmissions, and costs. Journal of renal care. 2014;40(3):150-6.
2. Shiva F, Sanaei A, Shamshiri AR, Ghotbi F. Survey of needle-stick injuries in pediatric health personnel of 5 university hospitals in Tehran. JPMA-Journal of the Pakistan Medical Association. 2011;61(2):127.
3. Asadi Fakhr A, Asadi S. Investigation of the number of stressors in operating room nurses. Pajouhan Scientific Journal. 2017;15(2):27-31.
4. Kasatpibal N, Whitney JD, Katechanok S, Ngamsakulrat S, Malairungsakul B, Sirikulsathean P, et al. Practices and impacts post-exposure to blood and body fluid in operating room nurses: A cross-sectional study. International journal of nursing studies. 2016;57:39-47.
5. Nagao M, Iinuma Y, Igawa J, Matsumura Y, Shirano M, Matsushima A, et al. Accidental exposures to blood and body fluid in the operation room and the issue of underreporting. Am J Infect Control. 2009;37(7):541-4.
6. Berguer R, Heller PJ. Preventing sharps injuries in the operating room. Journal of the American College of Surgeons. 2004;199(3):462-7.
7. Gabr HM, El-Badry AS, Younis FE. Risk Factors Associated with Needlestick Injuries among Health Care Workers in Menoufia Governorate, Egypt. The international journal of occupational and environmental medicine. 2018;9(2):63-8.
8. Auta A, Adewuyi EO, Tor-Anyiin A, Aziz D, Ogbole E, Ogbonna BO, et al. Health-care workers' occupational exposures to body fluids in 21 countries in Africa: systematic review and meta-analysis. Bulletin of the World Health Organization. 2017;95(12):831-41f.

9. Taheri MR, Khorvash F, Hasan Zadeh A. Assessment of mental workload and relationship with needlestick injuries among Isfahan Alzahra hospital nurses. medical journal of Mashhad University of medical sciences. 2016;58(10):70-577.
10. Mbaisi EM, Wanzala P, Omolo J. Prevalence and factors associated with percutaneous injuries and splash exposures among health-care workers in a provincial hospital, Kenya, 2010. Pan African Medical Journal. 2013;14(1).
11. Mobasherizadeh S, Ebneshahidi SA, Mohammadi NA, Abazari F. Intervention study of needlestick injury in Iran. Saudi medical journal. 2005;26(8):1225-7.
12. Mathews B, Birhan W, Kinfe S, Boru M, Tiruneh G, Addis Z, et al. Assessment of knowledge, attitude and practice towards post-exposure prophylaxis for HIV among health care workers in Gondar, North West Ethiopia. BMC public health. 2013;13:508.
13. Prüss-Üstün A, Rapiti E, Hutin Y .Estimation of the global burden of disease attributable to contaminated sharps injuries among health-care workers. American journal of industrial medicine. 2005;48(6):482-90.
14. Goniewicz M, Wloszczak-Szubzda A, Niemcewicz M, Witt M, Marciniak-Niemcewicz A, Jarosz MJ. Injuries caused by sharp instruments among healthcare workers–international and Polish perspectives. Annals of Agricultural and Environmental Medicine. 2012;19(3).
15. Abozead SE-S, Abuhasheesh M, Nawafleh H, Kawafha MM, Al-Tarawneh O. Knowledge and practices of Jordanian nurses on needlestick injuries: An evaluative study. Infectious Diseases in Clinical Practice. 2015;23(1):21-5.
16. Afridi AAK, Kumar A, Sayani R. Needlestick injuries–risk and preventive factors: a study among health care workers in tertiary care hospitals in Pakistan. Global journal of health science. 2013;5(4):85.
17. Azadi A, Anoosheh M, Delpisheh A. Frequency and barriers of underreported needlestick injuries amongst Iranian nurses, a questionnaire survey. Journal of clinical nursing. 2011;20(3-4):488-93.
18. Li Y-S, Chen P-S, Tsai S-J. A comparison of the learning styles among different nursing programs in Taiwan: implications for nursing education. Nurse education today. 2008;28(1):70-6.
19. Asadpour M, Ghofranipour F, Eftekhar Ardebili H, Niknami S, Hajizadeh E. Compliance with standard precautions among nursing care workers. Journal of Rafsanjan University of Medical Sciences. 2012;11(1):85-92.
20. Nouetchognou JS, Ateudjieu J, Jemea B, Mbanya D. Accidental exposures to blood and body fluids among health care workers in a Referral Hospital of Cameroon. BMC research notes. 2016;9:94.
21. Etesamirad M, R., Shahesmaeili A. factors related to knowledge, attitude and practice of hospital staff by occupational exposure to HIV, HBV and HCV in Afzalipour hospital of Kerman (2014-2015) [Thesis]. kerman: Kerman University of Medical Sciences; 2018 [persian].
22. Tiznobeik A, Refaie M, Soltanian A. Knowledge, attitude and practice of nursing and midwifery students toward post-exposure prophylaxis for HIV infection. Scientific Journal of Iranian Blood Transfusion Organization. 2013;10(3).
23. Abdela A, Woldu B, Haile K, Mathews B, Deressa T. Assessment of knowledge, attitudes, and practices toward prevention of hepatitis B virus infection among students of medicine and health sciences in Northwest Ethiopia. BMC research notes. 2016;9(1):410.
24. Adebimpe WO. Knowledge, Attitude, and Practice of Use of Safety Precautions Among Health Care Workers in a Nigerian Tertiary Hospital, 1 Year After the Ebola Virus Disease Epidemic. Annals of global health. 2016;82(5):897-902.
25. Simbar M, Shayanmanesh M, Naheed F. Knowledge, attitude and practice of midwives about HIV/AIDS prevention in a selected hospital in Isfahan City, 2006. Pajoohandeh Journal. 2008;12(6):535-40.
26. Chan MF. Factors affecting the compliance of operating room nursing staff toward standard and transmission-based precautions in an acute care hospital. American journal of infection control. 2010;38(8):666-7.
27. Chalya G, Chalya PL, Mbunda F. Knowledge, practice and factors associated with poor compliance with universal precautions among healthcare workers at Bugando Medical Centre, Mwanza, Tanzania. Tanzania Journal of Health Research. 2016;18(3).