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Knowledge and Information Sources of Standard Precautions among Physicians in Mashhad, Iran

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ABSTRACT

Introduction: Healthcare workers (HCWs) are exposed to percutaneous injuries. They are at risk of infection caused by bloodborne pathogens while performing routine clinical duties. Adherence to standard precautions can protect HCWs against diseases. The purpose of this study was to assess the level of physicians' knowledge regarding standard precautions and the use of information resources in the field of infection control.

Materials and Methods: A cross-sectional study was conducted on a total of 308 physicians working in five academic hospitals affiliated with Mashhad University of Medical Sciences over the period of January to March in 2015. Demographic and additional related data were obtained from all the participants using questionnaires and analysed in SPSS software (version 16).

Results: Most of the subjects were female specialists (60.7%)**.** The specialists' scores were over 90% considering some items related to standard precautions (i.e., the application of standard precautions, hand washing, and personal protective objects except protective caps or shoes); however, the scores were reported as < 70% regarding the items related to knowledge of standard precautions and goal of standard precautions. There was no significant difference in the knowledge of standard precautions among different medical groups (i.e., specialists, residents, and interns) (P=0.87). The most frequently mentioned source of information by the specialists (90%) was organizational instructions; however, the residents and interns (76%) preferred discussion with colleagues as the first source of information regarding standard precautions. The majority of specialists had not received enough training considering standard precautions (52.2%).

Conclusion: It was concluded that some guidelines are required regarding the training of standard precautions to HCWs.

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Introduction

It was estimated that 3.35 million healthcare workers (HCWs) have experienced percutaneous injuries (i.e. needlestick or other sharps injuries). Each year, 66,000, 16,000, and 1,000 infections caused by hepatitis B, hepatitis C, and human immunodeficiency viruses occur among HCWs, respectively. The centres for Disease Control and Prevention calculated that 385,000 percutaneous injuries happened annually among HCWs in the United States hospitals. It is important to report

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occupational injuries and training for the prevention of the aforementioned infections (1-3). The World Health Organization estimated that 9% of HCWs worldwide are at risk of pathogen transmission through the skin. Out of these three million people, 90% reside in low-income countries (3).

Many infections can be prevented through safe work practices, including standard precautions. These measures will be useful if the training of standard precautions is provided in universities for students and educators (4). Therefore, standard precautions have been designed to reduce the risk of occupational infection caused by known and unknown sources in healthcare settings (5). Various studies have shown that the physicians' knowledge of standard precautions is inadequate (6-7). The purpose of this study was to assess the level of physicians' knowledge regarding standard precautions and the use of information resources in the field of infection control.

Methods

A cross-sectional study was conducted on 308 physicians working in five academic hospitals affiliated with Mashhad University of Medical Sciences located in the northeast of Iran over the period of January to March in 2015. The questionnaires were given to 400 physicians, including 120 specialists, 150 residents, as well as 130 interns, that 308 participants completed the questionnaire. The questionnaire had four parts, including a) demographic characteristics (i.e., gender, age, educational level, and work experiences), b) questions assessing the knowledge of standard precautions, and c) medical information sources used regarding infection control in clinical practice.

The knowledge assessment questions had three possible answers (i.e., Yes, No, I do not know). Then, the questionnaire was validated by a panel of seven physicians (three resident, two interns, and two specialists). All of them agreed on the relevance of the questions and only some minor syntactical changes were made. Furthermore, a pilot study was conducted to test the questionnaire reliability prior to the main study. To this end, ten physicians working in different units of the hospital were included in the pilot study. The test–retest reliability of the instrument was conducted within two weeks. The participants were also invited to comment on the clarity and comprehensibility of the questions. In this study, the test-retest reliability was reported as 85%. The data were analysed using SPSS software (version 16).

Results

In this study, among physicians, the specialists tended to participate in standard precautions training (93.4%). The interns were provided with more training regarding standard precautions (71.7%) (Table1).

Table 2 tabulates that the specialists' scores were over 90% considering some items related to standard precautions (i.e., the application of standard precautions, hand washing, and personal protective objects except protective caps or shoes); however, the scores were reported as < 70% regarding the items related to the knowledge of standard precautions and goal of standard precautions. The residents' scores were below 60% for the items related to the knowledge of the standard precautions and use of gloves in oral care operation. The interns' scores were reported as < 75% regarding the items related to the knowledge of standard precautions, goal of standard precautions, and use of gloves in oral care operation, which may lead to contact with patient's mucosa.

Regarding the use of information sources for standard precautions, the most frequently mentioned information sources by the specialists were local instructions (90%) and discussion with colleagues (76%). Moreover, most of the residents and interns preferred discussion with colleagues as the first source of information considering standard precautions to other sources. The second sources of information among the residents and interns were educational classes and internet, respectively. In addition, women used more information sources than men did. There was a significant difference in the use of information sources among the participants with work experience (P-value=0.021).

Table 1. Characteristics of specialists (n=94), residents (n=110) and interns (n=104)

Physicians	Gender (%)		Age	Willingness to attend standard precaution training		Previous formal standard precaution training	
	Female	Male	Median (Interquartile range)	No	Yes	No	Yes
Specialists	54 (60.7)	35 (39.3)	39 (8.25)	6 (6.6)	85 (93.4)	47 (52.2)	43 (47.8)
Residents	45 (45)	55 (55)	33 (8)	21 (19.4)	87 (80.6)	37 (34.3)	71 (65.7)
Interns	46 (54.8)	38 (45.2)	25 (2)	18 (18.2)	81 (81.1)	28 (28.3)	71 (71.7)
Total	145 (53.1)	128 (46.9)	32.26 (10)	45 (15.1)	253 (84.9)	112 (37.7)	185 (62.3)
P-value	0.09		<0.001	0.024		0.002	

Table 2. Knowledge of participants regarding standard precautions

Question	Correct knowledge score (٪)			P-value
	Specialists	Residents	Interns	
Do you know standard precautions?	41 (44.6%)	55 (53.4%)	58 (60.4%)	0.009
Standard precautions are only applicable for the patients with the diagnosis of infection or in the latent period of infection.	89 (96.7%)	93 (87.7%)	84 (84.0%)	0.001
The main goal to implement standard precaution is to protect medical staff.	62 (68.1%)	78 (73.6%)	70 (71.4%)	0.154
Since using gloves enhances hand hygiene, there is a need to wash hands after pulling off the gloves.	76 (82.6%)	96 (88.9%)	88 (88.0%)	0.372
The gloves cannot be worn in oral care operation, because it leads to contact with the patient's mucosa.	69 (80.2%)	61 (59.8%)	54 (56.8%)	0.005
Washing and disinfecting hands are immediately required if contacted with any blood, body fluid, secretion, excretion, or dirty substance.	87 (97.8%)	100 (94.3%)	96 (96.0%)	0.229
Handwashing is required if contacted with different patients.	86 (94.5%)	98 (98.0%)	98 (100.0%)	0.029
Dirty protective objects should not be contacted with the surface of other objects, such as clothes, or staff outside the ward.	86 (98.9%)	101 (95.3%)	91 (93.8%)	0.001
Personal protective objects, such as gloves and masks, should not be shared.	88 (97.8%)	93 (91.2%)	92 (93.9%)	0.188
Gloves should be worn in blood drawing and venous puncture.	91 (100.0%)	101 (95.3%)	96 (98.0%)	0.089
The gloves should be worn during the operation due to contact with the secretion and excretion of a patient.	87 (96.7%)	92 (88.5%)	90 (93.8%)	0.195
Gloves should be changed if contacted with different patients.	86 (97.7%)	99 (99.0%)	95 (99.0%)	0.691
Facemasks or masks should be worn during operation due to the spraying of blood, body fluid, secretion or excretion.	88 (96.7%)	108 (100.0%)	96 (98.0%)	0.329
The protective goggles should be worn during operation due to the spraying of blood, body fluid, secretion, or excretion.	90 (98.9%	103 (99.0%)	96 (98.0%)	0.281
The protective suit should be worn in during operation due to the spraying of blood, body fluid, secretion, or excretion	88 (96.7%)	102 (96.2%)	92 (93.9%)	0.190
The protective caps or shoes should be worn during operation due to the spraying, flowing, or leaking of blood, body fluid, secretion, or excretion.	76 (83.5%)	100 (94.3%)	90 (91.8%)	0.028

Discussion

In this study, most of the physicians tended to have standard precaution training as it was observed in other studies (8). Most of the physicians had a high level of knowledge in terms of standard precautions. However, for the items related to the definition of standard precautions, most of the participants had a limited level of knowledge**.** Regarding the use of information sources for standard precautions, the most frequently mentioned source by specialists and residents was the discussion with colleagues, while the majority of the interns used the Internet that is consistent with the findings of a study carried out by Sarbaz et al. about residents' searching method for medical information (9). The results of the present study revealed that although the physicians had a high level of knowledge considering standard precautions, further training is required for some principles of standard precautions. Therefore, it is recommended to provide physicians with necessary training and common information sources to control infection.

Conclusion

Occupational injuries occur among HCWs; however, the knowledge of healthcare professionals considering the definition of standard precautions is still too limited. Many professionals claimed the lack of sufficient training regarding standard precautions in the workplace. Such circumstances should draw the attention of hospital authorities with regard to occupational health risks. Specific training programs should target newly graduated medical practitioners to establish appropriate practices.

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Conflicts of Interest

The authors declare that there is no conflict of interest.

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