Original Article

The knowledge, attitude, and practice of physicians and medical students of Rafsanjan University of Medical Sciences, Iran, regarding standard precautions

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Abstract

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Background: Physicians and medical students are at risk of exposure to a broad range of viral pathogens through percutaneous injury, contact of mucous membrane with blood, and other potentially infectious body fluids. The objective of this study was to determine the knowledge, attitude, and practice (KAP) of physicians and medical students of Rafsanjan University of Medical Sciences, Iran, regarding standard precautions.

Materials and Methods: This was a cross-sectional research based on a survey performed in 3 teaching hospitals affiliated with Rafsanjan University of Medical Sciences. Data were collected using a self-administered structured questionnaire. Subsequently, researchers distributed the questionnaires among the individuals who agreed to participate in the study. The participants were given instructions on completing the questionnaires. After completion of the questionnaires, they were collected and statistically processed with SPSS software using frequencies, percentages, the averages and standard deviations, and the independent t-test. All P values equal to or less than 0.05 were considered as statistically significant.

Results: The response rate in this study was 95%. The mean age of subjects was 27.6 ± 5.3 years. The majority of subjects were female (62.1%), single (66.3%), and medical interns (78.9%). Most subjects were untrained on standard precautions (64.5%). The mean and standard deviations of KAP scores were 37.6 ± 7.4 (out of 46), 32.6 ± 4.5 (out of 45), and 33.06 ± 6.5 (out of 44), respectively. The independent t-test showed significant differences between knowledge and practice scores and marital status. It also showed significant differences between the practice score and training on standard precautions ($P < 0.05$).

Conclusions: The results showed that the knowledge score was desirable, but the attitude and practice scores were not desirable. Thus, educational programs with the foundation of blood-borne infections, infection control, safety recommendations, and different aspects of standard precautions are recommended.

Keywords: Physicians, Medical Student, Knowledge, Attitudes, Precautions

Introduction

Hospital infections (HIs) can arise through the spreading of microorganisms, through personal hands, equipment, patient's blood, body fluid, secretions, and/or used solutions (1-3). Nosocomial infections, His, or health care-associated infections, are a serious problem in the healthcare services as they are common causes of illness and mortality among hospitalized patients (4,5). Physicians and medical students are at risk of hospital-acquired viral infections and exposure to a broad range of viral pathogens, including hepatitis B virus (HBV), hepatitis C virus

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(HCV), and human immunodeficiency virus (HIV), through percutaneous injury (e.g., needle stick and cut with a sharp object), contact of mucous membrane or nonintact skin with blood, tissue, or other potentially infectious body fluids (6).

After recognizing this threat, the United States Centers for Disease Control and Prevention (CDC) proposed a series of procedures for preventing occupational exposures, reducing the risk of transmission of blood-borne pathogens (BBPs), and handling potentially infectious materials such as blood and body fluids. These procedures are known as standard precautions (SPs) (6-8).

According to the SPs regulations, patient blood, body fluid, secretions, and excrement have infectivity, and thus, have an effect on both patients and medical staff. SPs include regular personal hygiene, hand washing, performing sterilization, and the safe removal of sharp instruments, handling and disposal of needles, sharp things, and use of protective barriers and personal protection equipment such as gloves, gown, face shields, and eye protection gear whenever there is contact with mucous membranes, blood, and body fluids of patients, and appropriate disposal of sharp instruments, body fluids, and other clinical wastes (3, 5, 7, 9, 10).

The HBV, HCV, and HIV infections are considered as a serious health problem worldwide (11, 12). The World Health Organization (WHO) estimates that about 3 million health care workers (HCWs) face occupational exposure to blood-borne viruses each year, and 90% of the infections occur in low income countries (7, 13). Some Reports indicate that SPs are effective in preventing both occupational exposure incidents and their associated infections (5, 8). Surveillance and follow-up of HCWs' compliance to SPs is an essential factor of occupational infection control as it enables assessment of risks of occupational exposure to infection and research programs are currently being performed on SPs regulations in many countries (7, 14-16).

Many studies have demonstrated that knowledge, attitude, and practice (KAP) of HCWs regarding the risk factors related to needle stick injuries (NSIs), use of preventative measures, and agreement with SPs, routes of spreading of HBV and HCV are insufficient and unsatisfactory (10, 17, 18). Consequently, the field of SPs has attracted increasing attention from all medical workers, and research programs are currently being performed on SPs regulations in many countries.

Therefore, the objectives of this study were to assess the rate of KAP of physicians and medical students of Rafsanjan University of Medical Sciences, Iran, regarding SPs.

Materials and Methods

This was a cross-sectional research based on a survey on 100 physicians and medical students in 3 teaching hospitals affiliated to Rafsanjan University of Medical Sciences. Data were collected using a self-administered structured questionnaire which comprised of 4 main sections including demographic variables, and KAP of physicians and medical students regarding SPs. The validity and reliability of the questionnaire were measured using content validity and Cronbach's alpha coefficient, respectively.

The mean knowledge of SPs was measured with the use of 23 items with 3 answer choices (true, false, and I do not know); 2 points for a correct answer, 0 for wrong answers, and 1 point was considered for not knowing (scores ranged from 0 to 46). The mean attitude toward the SPs was measured with the use of 9 items with 5-point Likert scale (completely disagree, disagree, disagree a little, agree a little, agree, completely

agree). To the completely agree answer 6 points was given and completely disagree received only 1 point (scores ranged from 9 to 45). The mean practice of the SPs was measured with the use of 11 items with 4 answer choices (never, sometimes, many times, always); where the answer was completely agree 6 points was given and completely disagree 1 point. Scores ranged from 11 to 44. A higher score means a higher KAP of the SPs.

Subsequently, researchers visited subjects and distributed the questionnaires among those who agreed to participate in the study. They were given instructions on completing the questionnaires. A total of 100 questionnaires had been distributed. After their completion, the questionnaires were collected.

Collected data were statistically processed using SPSS software (version 16, SPSS Inc., Chicago, IL, USA). Frequencies and percentages of the demographic variables of the participants, and the averages and standard deviations of the scores of knowledge, attitude, and practice of SPs were obtained. The independent t-test was used to analyze the scores of KAP of SPs by demographic variables of the subjects. All P values equal to or less than 0.05 were considered statistically significant.

Results

In the present study, 100 questionnaires were distributed among the samples and 95 of them were completed and returned and had faithful responses (response rate of 95%). The mean age of subjects was 27.6 ± 5.3 years. The majority of samples were female (62.1%), single (66.3%), and medical interns (78.9%). In addition, most subjects were untrained on SPs (64.5%) (Table 1).

Table 1: Distribution of samples by age, gender, marital status, occupation, and training on SPs

Variable	Answer	Number (%)
Age	< 26 y	46 (50)
	26-30 y	30 (32.6)
	31-35 y	5 (5.4)
	36-40 y	8 (8.7)
	> 40 y	3 (3.3)
	Missing	3 (3.3)
Gender	Male	36 (37.9)
	Female	59 (62.1)
Marital status	Single	63 (66.3)
	Married	32 (33.7)
Occupation	Medical Intern	75 (78.9)
	Physician	20 (21.1)
Trained about SPs	Yes	33 (35.5)
	No	60 (64.5)

The mean and standard deviations of KAP scores of subjects were 37.6 ± 7.4 (out of 46), 32.6 ± 4.5 (out of 45), and 33.06 ± 6.5 (out of 44), respectively (Table 2).

Table 2: The indicative mean and standard deviation of the scores of KAP of SPs

Variable	Mean ± SD	The range of scores	Min Scores	Max Scores
Knowledge	37.6 ± 7.4	0-46	14	46
Attitude	32.6 ± 4.5	9-45	15	45
Practice	33.06 ± 6.5	11-44	18	44

The independent t-test showed significant differences between knowledge and practice scores and marital status; the score of married subjects was higher than single subjects. The attitude score of married subjects was higher than single subjects, but this difference was not significant. Moreover, significant differences were observed between practice score and training on SPs; the score of trained subjects was higher than untrained subjects. Differences in knowledge and attitude scores were not significant (Table 3).

Table 3: Comparison of mean and standard deviation of the score of KAP of SPs with marital status and training on SPs

Variable			Mean ± SD	P-value
Knowledge	Marital status	Single	36.17 ± 7.77	0.01
		Married	40.28 ± 5.70	
	Training on SPs	Trained	37.2 ± 8.61	0.89
		Untrained	37.4 ± 6.58	
Attitude	Marital status	Single	32.24 ± 4.08	0.30
		Married	32.21 ± 5.14	
	Training on SPs	Trained	33.12 ± 4.85	0.38
		Untrained	32.26 ± 4.32	
Practice	Marital status	Single	32.00 ± 6.23	0.02
		Married	35.15 ± 6.65	
	Training on SPs	Trained	35.45 ± 6.34	0.01
		Untrained	31.81 ± 6.39	

The independent t-test showed significant differences between practice score and training on SPs; the score of subjects trained on SPs was higher than untrained subjects. Nevertheless, this difference was not significant in knowledge and attitude scores.

The independent t-test did not show any significant differences between KAP scores with demographic variables such as age, gender, location of residence, occupation, location of work, and years of health care employment ($P > 0.05$).

Discussion

In this study, the response rate was 95%, the mean age of subjects was 27.6 years. The majority of participants were female (62.1%), single (66.3%), and medical interns (78.9%). In addition, most subjects were untrained on SPs (64.5%). However, the response rate in the study by Hosoglu was 40.7%, the average age of the respondents was 31.4 years, and the majority were female (63.6%) (19). The response rate in the study by Melo was 91.1%, the average age of the respondents was 39.6 years, and the majority were female (91.5%). In the study by Doebbeling, the response rate was 63% (8), and in the study by Reda, it was 84.4% and the mean age of the respondents was 30.8 (7)

The results of this study showed that 35.5% of subjects had received training on SPs. Abou El-Enein and El Mahdy reported that none of the subjects had received training in the field of infection control (20). Ghofranipour et al. reported that 36.1% of their study samples had received training on universal precaution prior to their job (21). The results of this research are more satisfactory than those of the study by Abou El-Enein and El Mahdy (20), and Ghofranipour et al (21).

The results of this study showed that the knowledge score was desirable but attitude and practice scores were not desirable. In the study by Melo, 75.6% of subjects

understood SPs as protective measures and a strategy in daily health care activities (5). In the study by Doebbeling, mean rates of hand washing, avoiding needle recapping, and underreporting sharp injuries were 32–54%, 29–70%, 22-62% (overall: 32%), respectively. That varied by occupation and adherence to SPs and was found to be suboptimal. Researchers believed that a new strategy for preventing exposures, training, and monitoring adherence was needed (8).

The results of the study by Abou El-Enein and El Mahdy showed that less than half of the nurses (47.1%) of a dialysis unit in Alexandria, Egypt, were aware of washing their hands before and after patient care (20).

Cirelli, in his research, in the knowledge evaluation stage reported that only 9 of 29 professionals identified the professional's concept correctly (22). Previous studies have shown that misconceptions persist regarding universal precautions (16, 23, 24).

Previous studies have shown inadequate adherence to preventive measures, such as recapping needles, routine use of gloves, and hand washing after glove removal (7, 8, 25).

Results of the study by Amoran and Onwube implied that HCWs had inadequate knowledge about infection control (26). Nevertheless, the results of our research showed a desirable knowledge score.

Our study results emphasized the need for the evaluation of education on infection control practices and SPs in general. Moreover, they highlighted the necessity of performing structured infection control programs among all HCWs such as physicians, and nursing and midwifery staff, and all of the medical sciences students. Our results are in line with the study by Askarian et al., who showed that almost all of the participants reported that they required additional infection control education, especially on standard isolation precautions (27).

Sharma et al., in India, reported that only 50.2% of HCWs gave correct answers to questions regarding disease transmission through needle stick and sharp injury (28). In general, the results of the current research were similar to those of other studies (28-30).

Conclusion

Based on the results obtained in this research, educational programs with the foundation of blood-borne infections, infection control, safety recommendations, and different aspects of SPs training program are recommended.

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