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Knowledge and Awareness towards Non-Sterile Occupational Injuries and Preventive Measures Used by Final Year Students and Interns of Nursing, Dental and Medical College in Saudi Arabia

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Abstract

Introduction The present study was conducted to assess non-sterile occupational injuries and preventive measures in final year students and interns of nursing, dental and medical college.

Methods: 310 dental, nursing and medical students were asked about occupational injuries such as needle stick injuries, blood splashes, use of a head cap, face shield, head cap, vaccination and workshops. The response of all participants was recorded.

Results: There were 75 nursing (final year- 40, interns- 65), 55 dental (final year- 30, interns- 55) and 80 medical (final year- 58, interns- 62) students. 56.1% nursing, 22% dental and 35% medical final year students had Bio-aerosols splash to eyes, nose or mouth sometimes. 42% nursing 16%, dental and 12% medical interns had aerosols splash to eyes, nose or mouth sometimes. Needle stick injury was seen in 55% nursing, 24 dental and 72% medical final year and 34% nursing, 12% dental and 51% medical interns. Dental bur injury was seen in 68% dental final year and 45% interns only. Other injuries were seen in 20% nursing, 5% dental and 14% medical final years and 14% nursing, 2% dental and 7% medical interns. There was a significant difference among interns and final year students with regards to wearing of a mask, face shield, head cap, use of sterile tools, disposal of hazardous waste, immunization against HBV and preventive measures related workshops.

Conclusions: Dental and medical interns had sufficient knowledge and awareness regarding non-sterile occupational injuries.

Keywords: Dental, Medical, Non-sterile, Occupational injuries

Introduction

Exposure to bodily secretions/excretions or injuries caused by sharp instruments can lead to infection in health care professionals. Microorganisms present in the blood or other body fluids can be transmitted from patients to doctors [3].

The risk of accidental exposure to pathogens such as hepatitis B virus (HBV) and hepatitis C virus (HCV) and human immunodeficiency virus (HIV) is very high [4]. These accidental exposures may be prevented by adopting safe work practices and utilizing infection control guidelines. Immunization against these pathogens and suitable postexposure management is necessary to avoid complications [5].

Medical, dental and nursing students deal with patients for a significantly higher duration as compared to their seniors and staff owing to their training [6]. Thus, it is essential to provide them sufficient knowledge about infection control in hospitals [7]. Occupation injuries such as needle stick injuries, splashes of blood to the eyes, nose and mouth, musculoskeletal disorders, psychological problems, bur injuries among dental students, dermatitis and respiratory disorders, etc. are commonly observed [8]. The present study was conducted to assess non-sterile occupational injuries and preventive measures in final year students and interns of nursing, dental and medical college.

Methods

The present study was started after obtaining ethical clearance of the institute and we enrolled 310 dental, nursing and medical students of both genders after obtaining their verbal and written consent.

Data related to participants such as name, age, gender, etc. were recorded. We supplied a self-administered, anonymous questionnaire to all participants and were asked to respond accordingly. This questionnaire was based on occupational injuries such as needle stick injuries, blood splashes, etc. It also contains information regarding the use of a head cap, face shield, head cap, vaccination and workshops. The response of all participants was recorded. We assessed the knowledge and awareness regarding occupational injuries and methods to prevent it. The results of the study were compiled and entered in MS sheet where appropriate statistical tests were applied to determine the significance. A P-value less than 0.05 was considered significant.

Results

A total sample of 310 students were included from 33.9% nursing, 27.4% dental, and 38.7% medical faculties.

Table I: Distribution of the participants based on the faculty

Gender	Nursing	Dental	Medical
Final year	40	30	58
Interns	65	55	62
Total	105	85	120

Table I shows that there were 75 nursing (final year- 40, interns- 65), 55 dental (final year- 30, interns- 55) and 80 medical (final year- 58, interns- 62) students. Table II shows that the mean working hours for final years nursing students were 8.2 hours, dental students were 7.6 hours and medical students were 9.2 hours. The mean working hours for nursing interns were 8.6 hours, dental interns were 7.2 hours and medical interns were 8.7 hours. The difference was significant ($P< 0.05$).

Table II: Mean working hours among the students

Parameters	Students	Nursing	Dental	Medical	P-value
Working hours	Final year	8.2	7.6	9.2	0.040
	Interns	8.6	7.2	8.7	0.050

Table III shows that 56.1% of nursing, 22% dental and 35% medical final year students had Bio-aerosols splash to eyes, nose or mouth sometimes. 42% nursing 16%, dental and 12% medical interns had

aerosols splash to eyes, nose or mouth sometimes. The difference was significant (P< 0.05).

Needle stick injury was seen in 55% nursing, 24 dental and 72% medical final year and 34% nursing, 12% dental and 51% medial interns. Dental bur injury was seen in 68% dental final year and 45% interns only. Other injuries were seen in 20% nursing, 5% dental and 14% medical final years and 14% nursing, 2% dental and 7% medical interns. The difference was significant (P< 0.05).

Table IV shows that 45% of nursing, 60% dental and 72% medical final year students always wear white coat/gowns in contrast to 56%, 71% and 78% nursing, dental and medical interns respectively. 60% nursing, 82% dental and 56% medical final year students always wear face masks in contrast to 66%, 86% and 60% nursing, dental and medical interns respectively. 15% nursing, 65% dental and 25% medical final year students always wear eye shield in contrast to 20%, 75% and 34% nursing, dental and medical interns respectively. 30% nursing, 55% dental and 50% medical final year students always wear head cover in contrast to 40%, 62% and 65% nursing, dental and medical interns respectively. 58% nursing, 65% dental and 60% medical final year students always use disinfectants after hand wash in contrast to 60%, 75% and 64% nursing, dental and medical interns respectively. 52% nursing, 70% dental and 62% medical final year students always use sterile tools in contrast to 58%, 78% and 65% nursing, dental and medical interns respectively. 62% nursing, 74% dental and 72% medical final year students always safely dispose of hazardous waste in contrast to 65%, 78% and 80% nursing, dental and medical interns respectively. 68% nursing, 72% dental and 70% medical final year students always use both hands for recapping the needles in contrast to 70%, 74% and 71% nursing, dental and medical interns respectively. 65% nursing, 70% dental and 72% medical final year students always use puncture-proof containers for sharps disposal in contrast to 70%, 74% and 71% nursing, dental and medical interns respectively. 85% nursing, 90% dental and 94% medical final year students received Hepatitis B vaccination in contrast to 90%, 92% and 95% nursing, dental and medical interns respectively. 92% nursing, 98% dental and 95% medical final year students use universal precautions against HBV/ HIV in contrast to 95%, 99% and 97% nursing, dental and medical interns respectively. The difference was significant (P< 0.05).

Table V shows that 71% of nursing, 75% dental and 80% medical final year students received workshops about occupational hazards education in contrast to 74%, 85% and 82% nursing, dental and medical interns respectively. 84% nursing, 92% dental and 80% medical final year students found the duration of the workshop was appropriate in contrast to 86%, 92% and 82% nursing, dental and medical interns respectively. 90% nursing, 88% dental and 85% medical final year students found workshop had sufficient information in contrast to 91%, 85% and 86% nursing, dental and medical interns respectively. 90% nursing, 84% dental and 82% medical final year students received workshops about awareness of preventive measures in contrast to 95%, 85% and 84% nursing, dental and medical interns respectively. 86% nursing, 89% dental and 90% medical final year students found the duration of the workshop was appropriate in contrast to 87%, 79% and 92% nursing, dental and medical interns respectively. 92% nursing, 90% dental and 89% medical final year students found workshop had sufficient information in contrast to 94%, 88% and 86% nursing, dental and medical interns respectively. The difference was significant (P< 0.05).

Discussion:

Health is defined as a state of physical, mental and social well-being. Occupational health implies to physical, mental and social well- being of all occupational [9]. Health care professionals are at more risk of occupational health hazards. Non- sterile occupational injuries are quite common [10]. Third and final year students are relatively at higher risk as compared to interns. There should be well education in the form of camps, workshops, conventions, symposiums, conferences, etc. and awareness among dental, nursing and medical students [11]. The present study was conducted to assess non-sterile occupational injuries and preventive measures in final year students and interns of nursing, dental and medical college.

In this study, there were 310 dental, nursing and medical final year as well as interns. There were 75 nursing (final year- 40, interns- 65), 55 dental (final year- 30, interns- 55) and 80 medical (final year- 58, interns- 62) students. AlAnazi et al.,[12] included 100 participants, of which 85% were males and 15% were females; 87% of participants were excellent in applying the term preventive practices and the rest of the participants were moderate but the difference between the two groups was statistically insignificant (P= 0.103). The majority of participant's awareness about occupational hazards and preventive practices was weak and the difference between the two groups was statistically significant (P=0.000).

We observed that mean working hours for final years nursing students were 8.2 hours, dental students were 7.6 hours and medical students were 9.2 hours whereas in nursing interns was 8.6 hours, dental interns were 7.2 hours and medical interns were 8.7 hours. We found that there was bio-aerosols splash to eyes, nose or mouth sometimes seen in 56.1% nursing, 22% dental and 35% medical final year students and 42% nursing 16%, dental and 12% medical interns. It was seen higher in the final year as compared to interns.

McCarthy et al.,[13] reported nonsterile occupational injuries in 82% dental, 57% medical and 27% nursing respondents. Results showed 48% dental, 77% medical and 59% of nursing students had injuries and no postexposure follow-up. Dental students were more conscious of postexposure protocols. Frequent use of gloves, masks and protective eyewear was seen in final year students than other students. There was twice the number of percutaneous injuries in students who reported a 2-handed recapping of needles in comparison to those who avoided recapping or recapped with one hand using the scoop technique ($p < 0.05$). 100% dental, 99% medical and 95% of nursing students had immunization against HBV.

In this study we found that needle stick injury was seen in 55% nursing, 24 dental and 72% medical final year and 34% nursing, 12% dental and 51% medical interns. Dental bur injury was seen in 68% dental final year and 45% interns only. Other injuries were seen in 20% nursing, 5% dental and 14% medical final years and 14% nursing, 2% dental and 7% medical interns.

Shimoji et al.,[14] observed 32 occupational injuries with 23 sharp instrument injuries (71.9%), 6 splash exposures (18.8%), and 3 others. 20 workers (30.3%) reported to the hospital work safety team. There were 87.9% splash exposures and 60.3% conjunctiva exposures in dentists and 88.6% and 61.4% in dental hygienists respectively. 60.3% of dentists and 34.1% of dental hygienists use eyewear. The reason for low compliance of protective eyewear among dentists might relate to fine dental procedures.

We found that the use of gowns/ white coats, masks, eyewear, head cover was relatively higher in interns of all professions as compared to final years students. Medical and dental students had sufficient knowledge about preventive measures as compared to nursing students. Similarly, the measures regarding hand wash, use of disinfectants after hand wash, use of sterilized instruments, safely disposal of hazardous waste, use both hands for recapping the needles and use of puncture-proof containers for sharps disposal was highest among dental interns followed by and medical and nursing interns. We found that there was sufficient awareness of preventive measures workshops, occupational hazards education with appropriate duration and information. The instructor of the workshop was from the same university in most of the cases.

Preventive measures education against occupational hazards among health care professionals is the need of the hour. The shortcoming of the study is the small sample size.

Conclusions

The authors found that dental interns had sufficient knowledge and awareness regarding non-sterile occupational injuries followed by medical interns. There is a need to educate and create awareness through health and preventive measure related workshops among nursing students.

Conflict of interests:

The authors declared no conflict of interests

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Table III: Frequency and type of non-sterile occupational injury

Questionnaire	Students	Response	Nursing	Dental	Medical	P-value
Bio-aerosols splash to your eyes, nose or mouth	Final year	Sometimes	56.1%	22%	35%	0.01
		Never	43.9%	78%	65%	
	Interns	Sometimes	42%	16%	12%	
		Never	58%	84%	88%	
Percutaneous injuries						
Needle stick	Final year		55%	24%	72%	0.02
Dental burs			0%	68%	0%	
Others			20%	5%	14%	
Needle stick	Interns		34%	12%	51%	0.04
Dental burs			0%	45%	0%	
Others			14%	2%	7%	

Table IV: Association between preventive measures and students' faculty

Questionnaire	Students	Response	Nursing	Dental	Medical	P-value
Wearing gowns/ white coats	Final year	Always	45%	60%	72%	0.02
		Some times	28%	31%	22%	
		Never	27%	9%	6%	
	Interns	Always	56%	71%	78%	0.05
		Some times	30%	24%	20%	
		Never	14%	5%	2%	
Wearing face masks	Final year	Always	60%	82%	56%	0.01
		Some times	20%	14%	26%	
		Never	30%	4%	18%	
	Interns	Always	66%	86%	60%	0.05
		Some times	24%	14%	30%	
		Never	20%	0%	10%	
Wearing eye shield	Final year	Always	15%	65%	25%	0.02
		Some times	20%	20%	30%	
		Never	65%	15%	45%	
	Interns	Always	20%	75%	34%	0.02
		Some times	25%	20%	32%	
		Never	55%	5%	34%	
Wearing headcover	Final year	Always	30%	55%	50%	0.03
		Some times	35%	20%	28%	
		Never	35%	25%	22%	
	Interns	Always	40%	62%	65%	0.05
		Some times	35%	24%	22%	
		Never	25%	14%	13%	
Hand wash before patients	Final year	Always	60%	82%	64%	0.01
		Some times	35%	14%	24%	

		Never	5%	4%	12%	
	Interns	Always	62%	85%	67%	0.04
		Some times	37%	12%	24%	
		Never	1%	3%	9%	
Disinfectants after hand wash	Final year	Always	58%	65%	60%	0.02
		Some times	32%	22%	24%	
		Never	10%	13%	16%	
	Interns	Always	60%	75%	64%	0.01
		Some times	34%	12%	20%	
		Never	6%	13%	6%	
Use of sterile tools	Final year	Always	52%	70%	62%	0.01
		Some times	30%	24%	28%	
		Never	18%	6%	10%	
	Interns	Always	58%	78%	65%	0.05
		Some times	34%	21%	28%	
		Never	8%	1%	7%	
Safely dispose of hazardous waste	Final year	Always	62%	74%	72%	0.03
		Some times	30%	20%	20%	
		Never	8%	6%	8%	
	Interns	Always	65%	78%	80%	0.02
		Some times	32%	21%	15%	
		Never	3%	1%	5%	
Use both hands for recapping the needles	Final year	Always	68%	72%	70%	0.04
		Some times	22%	26%	5%	
		Never	10%	2%	25%	
	Interns	Always	70%	74%	71%	0.02
		Some times	24%	22%	10%	
		Never	6%	4%	19%	
Use of puncture-proof containers	Final year	Always	65%	70%	72%	0.01
		Some times	24%	24%	14%	

for sharps disposal		Never	11%	6%	14%	
	Interns	Always	72%	75%	74%	0.05
		Some times	26%	22%	16%	
		Never	4%	3%	10%	
Received Hepatitis B vaccination	Final year	Yes	85%	90%	94%	0.03
		No	6%	8%	4%	
		Don't know	9%	2%	2%	
	Interns	Yes	90%	92%	95%	0.04
		No	6%	7%	3%	
		Don't know	4%	1%	2%	
Use universal precautions against HBV/ HIV?	Final year	Always	92%	98%	95%	0.01
		Some times	6%	1%	4%	
		Never	2%	1%	1%	
	Interns	Always	95%	99%	97%	0.001
		Some times	4%	1%	3%	
		Never	1%	0%	0%	

Table V: Workshop related factors associated with non-sterile occupational injury

Questionnaire	Students	Response	Nursing	Dental	Medical	P-value
Received workshops about occupational hazards education	Final year	Yes	71%	75%	80%	0.04
		No	12%	25%	10%	
		Don't know	17%	10%	10%	
	Interns	Yes	74%	85%	82%	0.03
		No	16%	12%	10%	
		Don't know	10%	3%	8%	
The instructor of the workshop was from	Final year	University	85%	90%	92%	0.01
		Outside	10%	3%	0%	
		Don't know	5%	7%	8%	
	Interns	University	82%	91%	82%	0.05
		Outside	10%	4%	4%	
		Don't know	8%	5%	8%	
The duration of the workshop was appropriate	Final year	Yes	84%	92%	80%	0.04
		No	10%	4%	8%	
		Don't know	6%	4%	12%	
	Interns	Yes	86%	92%	82%	0.01
		No	12%	6%	7%	
		Don't know	2%	2%	9%	
Workshop had sufficient information	Final year	Yes	90%	88%	85%	0.03
		No	4%	6%	4%	
		Don't know	6%	6%	11%	
	Interns	Yes	91%	85%	86%	0.01
		No	3%	7%	4%	
		Don't know	6%	8%	10%	
Workshops about awareness of preventive measures	Final year	Yes	90%	84%	82%	0.05
		No	2%	6%	6%	
		Don't know	8%	10%	12%	
	Interns	Yes	95%	85%	84%	0.02

		No	2%	6%	6%	
		Don’t know	2%	9%	10%	
The instructor of the workshop was from	Final year	University	84%	80%	87%	0.04
		Outside	10%	13%	10%	
		Don’t know	6%	7%	3%	
	Interns	University	85%	77%	84%	0.001
		Outside	8%	13%	10%	
		Don’t know	7%	10%	6%	
The duration of the workshop was appropriate	Final year	Yes	86%	89%	90%	0.04
		No	7%	8%	10%	
		Don’t know	7%	3%	0%	
	Interns	Yes	87%	79%	92%	0.001
		No	7%	11%	6%	
		Don’t know	6%	10%	2%	
Workshop had sufficient information	Final year	Yes	92%	90%	89%	0.02
		No	6%	6%	6%	
		Don’t know	2%	4%	5%	
	Interns	Yes	94%	88%	86%	0.05
		No	3%	7%	11%	
		Don’t know	3%	5%	3%	


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