

## Knowledge, attitudes and self-reported practices of health sciences students regarding hospital-acquired infection control protocols

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**Objective:** To evaluate the knowledge, attitudes, and self-reported practices of health sciences students regarding prevention of hospital acquired infections.

**Methodology:** An observational cross sectional survey was conducted at Rawalpindi Medical University from March to November 2019 on 165 students from disciplines of MBBS, Allied Health Sciences and Nursing. Students were selected through convenience sampling. A self-designed questionnaire was used and the data were analyzed using SPSS version 25.

**Results:** The mean knowledge score was  $9.78 \pm 1.87$ . Mean practice score was  $5.52 \pm 1.97$ . Only 30.3% of the responders knew that needles should not be recapped after use. 64.2% of the

students had a keen attitude towards improving their knowledge and practices. Mean knowledge and practice scores were significantly different between the three course groups ( $p=0.041$ ,  $p=0.001$ ) with nursing students having highest mean knowledge and practice scores.

**Conclusion:** The students had adequate knowledge about prevention of hospital acquired infections. The attitude of students towards learning about infection control was positive. There was significant difference in the knowledge and practice scores of different disciplines of students. (Rawal Med J 202;46:22-25).

**Keywords:** Infection control, hand hygiene, standard precautions.

### INTRODUCTION

Hospital acquired infections (HAIs) are infections that a patient acquires in a hospital setting which were not present or incubating at the time of admission.<sup>1</sup> HAIs are important adverse events in healthcare worldwide and can occur as a part of an endemic or epidemic situation and affect the quality of care of hundreds of millions of patients every year.<sup>2</sup> HAIs increase hospital stay and readmissions thus incurring additional economic burden on healthcare resources and patients.<sup>3</sup> In developing countries, risk of acquiring HAI is 2-20 times higher than developed countries.<sup>4</sup>

Infection prevention plays a key role in reducing the rate of healthcare associated infections. Hand hygiene and use of personal protective equipment have shown to decrease nosocomial infections.<sup>5</sup> Improved compliance to hand hygiene guidelines can reduce HAIs by about 40%.<sup>6</sup> Students of health care sciences come in contact with patients during their clinical rotations and poor adherence to infection control protocols can increase the risk of spreading HAIs. A study in Qatar reported

that 48% of medical students were aware of standard precautions for prevention of HAIs.<sup>7</sup> Considering the detriment of HAIs, it is imperative for health care workers and students to have adequate knowledge of infection control practices. We conducted this study to assess the knowledge, attitudes and practices of health sciences students towards infection control protocols.

### METHODOLOGY

This observational cross-sectional study was conducted at Rawalpindi Medical University on 165 students from March 2019 to November 2019. Convenience sampling method was used and the participants from the disciplines of MBBS (3<sup>rd</sup>, 4<sup>th</sup> and final year), Allied health sciences (3<sup>rd</sup>, 4<sup>th</sup> and final year) and Nursing (1<sup>st</sup>-final year). Study was approved by the ethics committee of the university and informed consent was obtained from all participants.

A self-made, self-administered questionnaire was developed according to guidelines by WHO for

prevention of HAIs.<sup>8</sup> It consisted of four sections i.e. demographics, knowledge, practices and attitudes. Domains tested included hand hygiene (HH), use of personal protective equipment (PPE) and protocols for prevention of needle stick injuries (NSIs). Knowledge was assessed by 13 questions. A score of '1' was given if the response was in agreement with WHO guidelines while a score of '0' was given in case of incorrect/do not know response. Knowledge score ranged from '0' to '13'. Practices were assessed with nine statements using four-point Likert scale of 'always', 'usually', 'sometimes', 'never'. A score of '1' was assigned to correct practice (Always) and '0' was assigned to other responses. Practice score ranged from 0 to 9. Attitudes were assessed using a 5-point Likert scale.

**Statistical Analysis:** Statistical analysis was performed using SPSS version 25. Independent-samples *t*-test was used for comparison. Non-parametric Kruskal Wallis test was used to compare

means of course groups.  $p \leq 0.05$  was considered significant.

## RESULTS

Out of 165 participants, 135(81.8%) were female 30(18.2%) male. The mean age was  $21.36 \pm 1.53$  years. Out of the sample population, 60 (36.4%) students were from disciplines of MBBS, 48 (29.1%) from Allied health sciences and 57 (34.5%) from nursing. Mean knowledge score was  $9.78 \pm 1.87$  out of 13. Unclean hands as a major source of transmission of harmful germs was identified by 156(94.5%) students (Table 1). Only 50 (30.3%) students knew that needles should not be recapped after usage. There was significant difference between students of different course groups regarding recapping needles as 50.9% nursing students gave correct answer followed by 21.7% of MBBS students and 16.7% of AHS students ( $p=0.000$ ) (Table 2).

**Table 1. Correct responses of students towards questions assessing the knowledge.**

Statement	MBBS N (%)	AHS N (%)	Nursing N (%)	Total N (%)
1. Infection control practices should be followed with all patients.	55(91.7)	45(93.8)	51(89.5)	151(91.5)
2. Unclean hands are major source of spread of harmful germs.	52(86.7)	48(100)	56(98.2)	156(94.5)
3. HH to be performed before and after touching patient.	56(93.3)	47(97.9)	54(94.7)	157(95.2)
4. Hands to be washed with soap and water if soiled with secretions.	51(85.0)	43(89.6)	54(94.7)	148(89.7)
5. Alcoholic hand rub can be used instead of soap and water if hands are not soiled with secretions.	37(61.7)	33(68.8)	43(75.4)	113(68.5)
6. Use of gloves does not eliminate need for HH.	43(71.7)	25(52.1)	32(56.1)	100(60.6)
7. Gloves to be worn if contact with secretions.	56(93.3)	47(97.9)	49(86.0)	152(92.1)
8. Masks, gowns, eye protection to be worn if contact with secretions.	58(96.7)	45(93.8)	49(86.0)	152(92.1)
9. PPE should be changed between different procedures on same patient.	42(70.0)	26(54.2)	39(68.4)	107(64.8)
10. Needles should not be recapped after use.	13(21.7)	8(16.7)	29(50.9)	50(30.3)
11. Used needles should be discarded in designated boxes.	55(91.7)	40(83.3)	54(94.7)	149(90.3)
12. Post exposure prophylaxis for HIV after NSI includes taking ART within 72 hours.	32(53.3)	25(52.1)	38(66.7)	95(57.6)
13. Immediate management of NSI is washing wound with soap and water.	29(48.3)	23(47.9)	33(57.9)	85(51.5)

AHS=Allied Health Sciences, HH= Hand Hygiene, PPE=Personal Protective Equipment, NSI=Needle Stick Injury, ART=Antiretroviral therapy

**Table 2. Comparison of mean knowledge and practice scores using Kruskal Wallis test.**

Course	Knowledge Mean $\pm$ SD	p-value	Practices Mean $\pm$ SD	p-value
MBBS(a)	9.65 $\pm$ 2.21	0.041(x)y	4.85 $\pm$ 2.10	0.001 (x)y
AHS(b)	9.47 $\pm$ 1.56	a=b 0.231	5.56 $\pm$ 1.73	a=b 0.176
Nursing(c)	10.19 $\pm$ 1.68	b=c 0.007 a=c 0.247	6.19 $\pm$ 1.78	b=c 0.342 a=c 0.001

(x) = p value for Kruskal-Wallis test for comparison of means,  
(y) = multiple comparisons using Mann Whitney U test.

Mean practice score was  $5.52 \pm 1.97$  out of 9. With regards to hand hygiene practices, NSI prevention practices and use of PPE responses are shown in Table 1. Mean knowledge and practice scores were significantly different between three course groups ( $p=0.041$ ,  $p=0.001$ ) with nursing students having the highest mean knowledge and practice score. (Table 2). Regarding attitudes, 106 (64.2%) students were willing to improve adherence to standard precautions and 160 (97.0%) were in favor of intervention in curriculum to better teach infection control protocols.

## DISCUSSION

In this study, mean knowledge score of the participants was  $9.78 \pm 1.87$  out of 13 which indicates that majority of the participants had an acceptable knowledge score. Out of the three domains, lowest score was for NSI prevention protocols. Comparison of mean knowledge and practice scores of the three course groups showed a statistically significant difference ( $p < 0.05$ ) with nursing students having the highest mean knowledge and practice score.

Our results are similar to a study by Alotaibi et al which reported significant difference between different course groups with nursing students having higher knowledge scores than medical students.<sup>9</sup> Another study from Italy showed that nursing students obtained a higher knowledge score than medical students ( $p < 0.001$ ).<sup>10</sup> These results call for the evaluation of curriculum of all health science disciplines to find the areas of deficiency so that students of all health science disciplines can have a good training of infection prevention.

Knowledge regarding hand hygiene was highest

among the three domains. Sizeable proportion (39.4%) of students had the view that use of gloves eliminates the need for hand hygiene. These findings are similar to a study from India in which 25.8% of medical and 38.6% of nursing students believed that wearing gloves reduces the need of hand hygiene.<sup>11</sup> WHO guidelines on hand hygiene state that the use of gloves does not eliminate the need of hand hygiene and hands should be washed after removal of gloves.<sup>12</sup>

This study also showed that only 30.3% students were aware that needles should not be recapped after use and 71.5% students reported recapping needles after use. These results are comparable to a study from India in which 77.7% students reported recapping needles after use.<sup>13</sup> Recapping or manipulating needles after usage increases the risk of getting a needle stick injury and acquiring blood borne infections. A study from India showed that majority (48%) of NSI were acquired during recapping needles.<sup>14</sup> Our study showed that

recapping needles is a common and potentially dangerous misconception held by students. Recapping of needles is prohibited under Occupation Safety and Health Administration (OSHA) and WHO guidelines for preventing Needle Stick injuries.<sup>15,16</sup>

Students showed positive attitude towards learning about infection prevention and majority were willing to improve adherence to standard precautions. Studies have shown that educational intervention significantly increases knowledge and compliance of students toward standard precautions.<sup>17,18</sup> Health-care students are professionals in training and the skills they acquire in their student years will be instilled in their practice. Thus, it is imperative to incorporate infection prevention protocols through lectures, seminars, assessments, bed side teaching in the curriculum at the start of clinical rotations so that students are aware of the importance of infection control.

There are a few limitations in the study. Male participation in the study was less. This gender disparity was due to the fact that all the students in allied health sciences and nursing were female. The

study was conducted in just one medical university so the findings cannot be generalized. Practices were recorded by self-reporting and not through observation which may lead to inaccurate reporting. More studies need to be conducted, taking these limitations into consideration.

## CONCLUSION

The knowledge of the students regarding infection control was adequate except knowledge for the prevention of needle stick injuries. Students showed a positive attitude towards the importance of HAI control. There was significant difference in the knowledge and practice scores of different disciplines so adequate evaluation of the curriculum is needed to teach infection prevention protocols more effectively.

### Author Contributions:

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