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The Compliance with Infection Prevention and Control Measures by Allied Healthcare Students in a University Context

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Abstract

Background: The COVID-19 pandemic has had a serious effect on the global public health system and on people's daily lives.

Purpose: This study compares the mean difference between control and experimental groups of college students in their adherence to international standard precautions in health care. The students are eligible for pre-field training.

Methods: A cross-sectional survey was conducted to recruit 250 students from a government university in Jordan. Self-reported questionnaires were used to collect data through Google Forms. The mean difference between the control and experimental groups was compared using independent t-test analyses.

Results: An independent t-test revealed a significant mean difference (p value > 0.001) between the control and experimental groups in their adherence to all international standard precautions except hand washing.

Conclusion: Allied healthcare students appeared to adhere to worldwide standard precautions at low levels, according to the findings, which are based on visible contamination. For those studying allied health care, the importance of capacity-building activities, mentoring, and supportive supervision should be emphasised. This study concluded that allied healthcare students must continue their compliance with infection prevention to be ready for an unpredictable future with probable pandemics and view every service as potentially contaminated.

Keywords: university students, allied health, infection prevention, standard precautions

Introduction

The purpose of standard precautions, which were introduced and put into use at an earlier stage in the history of medicine, is to guarantee that healthcare facilities follow the bare minimum infection prevention procedures. Standard precautions have been improved and updated in response to various hazards of exposure among healthcare workers (HCWs) (1)(2) and promote the wellbeing of both HCWs and patients (1)(3). Among HCWs, nurses are highly susceptible to contracting an infection from occupational exposure in various healthcare settings than the general public (4)(5), and following standard precautions in all circumstances, whether the patients are infected or not,

would be considered one of the most effective ways to minimise cross-transmission (6). Despite considerable improvement in preparedness as a result of learning from previous epidemics, HCW compliance with ideal practices remains poor, and compliance rates differ among the various standard precautions (7)(3).

As of January 2021, COVID-19 had spread throughout the world, affecting 94 million people and killing approximately 2 million (8). HCWs are the most important resources for treating patients on the frontlines of the COVID-19 pandemic as it spreads. They run a higher risk of contracting the disease as well, which might make it difficult to contain the outbreak and cause the healthcare system to disintegrate (9). According to many studies, roughly 10% of HCWs had COVID-19, and 29% of infections were due to unintentional contact with a patient in a facility that did not have the virus (10). Additionally, recent data suggest the possibility of COVID-19 spreading asymptomatically to HCWs (11). To protect HCWs and improve the health care system's response to COVID-19 (2), the World Health Organization has recommended a number of workplace infection control measures at individual and organisational levels. Even though workplace infection prevention measures are crucial for preserving occupational health in the healthcare industry, they are ineffective if individual HCWs fail to adhere to them (9). Thus, to preserve the health of HCWs and reduce the danger of cross-transmission and infection during a pandemic, workplaces have to establish acceptable infection control rules and practices in all healthcare settings. Studies on HCW perceptions of workplace infection control policies and practices in healthcare settings, however, are scarce (12), and it is unknown how the level of compliance during the epidemic relates to this.

To fill the research gap, this study aims to evaluate HCWs' levels of compliance with infection prevention and control techniques in various healthcare settings and investigate the relationship between compliance, attitudes toward these measures, and the HCWs' characteristics. The findings are crucial in guiding the strategies and interventions required to improve workplace regulations in healthcare facilities and retain the healthcare system's ability to fight a pandemic while also maintaining vital services.

Methods

The primary purpose of this study was to develop, implement, and evaluate the effect of novel intervention program and their effects on increasing compliance with standard precautions among allied health sciences students pre-field training after the COVID-19 pandemic.

This study was conducted among allied health students and applied a cross-sectional design to determine and evaluate an intervention program. A group of allied health students were identified from registration records of Irbid University College. The allied health students were subsequently identified from the list of those who participated in this study. The inclusion criteria were all male and female allied health students who were registered for pre-field training and had completed at least three academic semesters. They had to be able and willing to participate in the study.

Students who volunteered to serve in field hospitals were excluded from this study. A random sample of 250 individuals were recruited from diploma allied health programs such as midwifery, nursing, pharmacy, and physiotherapy. Randomisation was carried out and the students were assigned to either the intervention or the control group. The sample size was calculated according to the targeted undergraduate students.

In addition to demographic data, such as age and gender, the participants' educational institution, nationality, and type of program enrolled in were also recorded.

An 18-item compliance with standard precautions scale was used. Data entry and analysis were performed using SPSS version 27. Independent t-test was performed to compare the mean difference between the intervention and control groups.

This intervention study consisted of two groups: experimental and control. In the experimental part of this current study, all teaching laboratories had particulate contamination visible particles. However, the laboratories used in the control group had particulate contamination invisible particles. A professional setting was reproduced to assess certain practical abilities of teaching laboratories. All international standard precautions were to be followed by the participants in the same manner as they would normally do. A room was built to resemble the ward environment as closely as possible and handle patients or their fluids well. These conditions were set forth uniformly. The workspace was equipped with a working table, cabinets holding various manipulation tools, PPE, trash cans, hand hygiene and disinfection tools, cleaning supplies, and a phone.

Results

A total of 250 students were enrolled in the study. Among them, 26 dropped out, 72.2% were females, and approximately 27% were males. Mean age group was 23 years old. All participants are from nursing, midwifery, pharmacy, and physiotherapy program.

Table 1 shows the results of the independent t-test. The results showed a significant difference in the intervention group post-implementation in all scale items with p value <0.001. However, there was no significance in item number 2 from the questionnaire as the p value was 0.854.

Table 1: Comparison between intervention and control group

Variable	Mean (SD)		t statistics	*p* value
	Intervention	Control		
1. I wash my hands between patient contacts.	3.71 (.69)	2.37 (.79)	13.160	<0.001
2. I only use water for hand washing.	3.71 (.69)	3.69 (.51)	.184	0. .854
3. I use alcoholic hand rubs as an alternative if my hands are not visibly soiled.	3.71 (.69)	1.37 (.55)	26.069	<0.001
4. I recap used needles after use	3.43 (1.04)	2.18 (.61)	9.897	<0.001
5. I put used sharp articles into sharps boxes.	3.66 (.73)	2.20 (.69)	14.556	<0.001
6. The sharps box is disposed only when it is full.	3.06 (1.01)	2.17 (.88)	6.617	<0.001
7. I take a shower in case of extensive splashing even	3.47 (.80)	1.13	24.999	<0.001

after I have put on Personal Protective Equipment (PPE).		(.34)		
8. I cover my wound(s) or lesion(s) with waterproof dressing before handling used medical equipment.	3.47 (.81)	1.24 (.51)	22.432	<0.001
9. I wear gloves when I am exposed to body fluids, blood products, and any excretion of patients.	3.63 (.75)	1.53 (.67)	20.797	<0.001
10. I change gloves between medical procedures.	3.65 (.68)	1.07 (.26)	32.764	<0.001
11. I decontaminate my hands immediately after removal of gloves.	3.52 (.86)	1.28 (.55)	21.112	<0.001
12. I wear a surgical mask alone or in combination with goggles, face shield and apron whenever there is a possibility of a splash or splatter	3.39 (.86)	1.46 (.78)	16.592	<0.001
13. My mouth and nose are covered when I wear a mask.	3.69 (.68)	1.21 (.49)	28.551	<0.001
14. I reuse a surgical mask or disposable Personal Protective Equipment (PPE).	2.13 (1.27)	3.37 (.78)	-8.020	<0.001
15. I wear a gown or apron when exposed to blood, body fluids or any patient excretions.	3.42 (.89)	1.04 (.21)	23.685	<0.001
16. I decontaminate surfaces and equipment after use.	3.67 (.66)	1.29 (.48)	28.261	<0.001
17. I wear gloves to decontaminate used equipment with visible soils.	3.42 (.88)	1.20 (.46)	21.078	<0.001
18. I clean up spillage of blood or other body fluids immediately with disinfectants.	3.67 (.64)	1.39 (.58)	26.385	<0.001

Discussion

High competence and compliance from the beginning of the allied health student's education is crucial to their health preservation. This study compared the compliance in routine education for students with an additional visible contamination particulate to identify their personal compliance with strict international standards.

COVID-19 is a highly contagious viral disease that has affected millions of people worldwide(13) It has brought about significant changes in the way people live, work, and interact with each other. Standard precautions are essential measures that can help prevent the spread of the virus (14) . The new coronavirus is spreading throughout the world and underscoring the need to protect allied health students, especially medical field personnel who are vulnerable, such as nurses, midwives, pharmacists, physiotherapists, and dental technicians who attend to COVID-19 patients, whether confirmed or under investigation, in operating rooms and other locations, such as the main floor, intermediate care units, and intensive care units (15).

Comparatively, the knowledge and practical compliance skills of allied health students were evaluated. A self-rating questionnaire was used to evaluate how both knowledge and skill-transfer techniques for education affected compliance with international standards based on visible and invisible contamination. This study demonstrated that regular education alone was insufficient to adequately prepare allied health students for compliance with infection control standards. This result is consistent with a previous study's findings (16) as low levels of understanding and adherence to standard precautions were reported by the nursing students in Jordan, and only a small number had a high score. Moreover, approximately half of the nursing students did not follow standard precautions, indicating that these measures were not generally followed by these students. Good knowledge, a workplace that was perceived to be safe, and attendance in seminars or training in the recent six months were the main variables linked to good compliance (17)(18). The possible explanation that the mean age was 23 years old, therefore, the young generations are reluctant to comply and follow instruction (19). In addition to those students were getting training in the university setting and did not deal with patients directly. On the contrary, findings showed that effective clinical leadership and role modelling were crucial to ensuring that all medical students would strictly adhere to infection prevention and control guidelines as a top priority (20).

Overall, this study showed that the participants' understanding of international infection control practice was inadequate and not significantly correlated to their compliance. Their low level of misconception was aligned with noncompliance, according to a study that assessed nursing students' understanding of both transmission-based precautions and routine precautions (21). A few previous studies have found that knowledge significantly affects compliance

(22), but many more have concluded that knowledge has no discernible impact. It can be inferred that since information does not directly influence practice, it has no bearing on students' compliance (23).

Conclusion

The COVID-19 pandemic has highlighted the importance of standard precautions in preventing the spread of infectious diseases. Allied health sciences students, who are often involved in patient care, need to be trained on standard precautions and compliance to ensure patient and personal safety. Therefore, an intervention program aimed at increasing compliance with standard precautions among allied health science students' pre-field training after the COVID-19 pandemic would be highly beneficial. The infection prevention plan should be included in the teaching curriculum for routinely cleaning and disinfecting laboratory surfaces. Cleaning and disinfection practices for laboratory surfaces in university facilities must be scheduled based on a clear plan.

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