ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 8.4
IJAR 2022; 8(2): 517-520
www.allresearchjournal.com
Received: 28-12-2021
Accepted: 30-01-2022

Dr. Nidhi Ladha
(PT), Assistant Professor, PES Modern College of Physiotherapy, Shivajinagar, Pune, Maharashtra, India

Dr. Vanshika Ramrakhyani
(PT), D.Y Patil University, School of Physiotherapy, Nerul, Navi Mumbai, Maharashtra, India

Corresponding Author:
Dr. Nidhi Ladha
(PT), Assistant Professor, PES Modern College of Physiotherapy, Shivajinagar, Pune, Maharashtra, India

Knowledge, practice level & attitude towards standard precautions and biomedical waste management among physiotherapy students

Dr. Nidhi Ladha and Dr. Vanshika Ramrakhyani

DOI: https://doi.org/10.22271/allresearch.2022.v8.i2g.9493

Abstract
Background: Healthcare-associated infections have been reported as a serious problem in healthcare services as these are common causes of illness and mortality among hospitalized patients including healthcare workers. Compliance with the standard precautions has been shown to not only reduce the risk of nosocomial infections but also aids in the prevention of occupational associated infections. Adherence to the precautions reduces the length of hospital stay and speeds up the recovery process.
Objective: To assess the knowledge, practice level, and attitude towards standard precautions and biomedical waste management among physiotherapy students.
Method: A cross-sectional study with a sample size of 150 physiotherapy students was conducted at the School of Physiotherapy, D.Y Patil University, Navi Mumbai. A self-administered questionnaire was used which was categorized in four domains inquiring about students' knowledge, implementation, practice and attitude towards standard precautions and bio medical waste management. Student's knowledge was assessed and the collected data were analyzed using statistical software SPSS version 23 in the form of descriptive statistics.
Results: The current study revealed that 77.3% (116 out of 150) & 68.00% (102 out of 150) of the subjects were aware of standard precautions and bio medical waste management guidelines respectively but on an average only 35.00% (52 out of 150) of the subjects had correct knowledge regarding the same. The study also showed that only 37.00% (56 out of 150) and 20.00% (30 out of 150) of the subjects reported correct practices with regards to standard precautions and bio medical waste management respectively.
Conclusion: Students were aware of standard precautions and bio medical waste management but had poor knowledge as well as practices. Students find it necessary to follow the guidelines but have insufficient knowledge and agreed on having awareness sessions.

Keywords: infections, standard precautions, biomedical waste management, physiotherapy, guidelines

1. Introduction
Healthcare-associated infection (HCAI) is defined as an infection occurring in a patient during the process of care in a hospital or other healthcare facility which was not present or incubating at the time of admission. It has been estimated that the prevalence of HCAI in developed and developing countries is 7.6% and 10.1% respectively [1].
The most effective and simple way to prevent infection in the hospital is to follow standard precautions (SPs), which are a set of recommendations designed to prevent or minimize exposure to infectious agents by hospital staff as well as by students [2]. SPs assume that the blood and body substances of all patients are potential sources of infection, regardless of the diagnosis, or presumed infectious status [2]. The components of SPs include use of personal protective equipment like gloves, gowns, masks, face shields, Hand hygiene protocol, Transmission based precautions which consist of airborne precautions, droplet precautions, contact precautions, and Biomedical waste (BMW) management. BMW management is based on a color-coding system that has 5 different color bags i.e. Red bag, a Yellow bag, a Cardboard box with blue marking, a White puncture-proof container & a Black bag [18].
Medical students should have an adequate knowledge of waste disposal system before their initial training period at a hospital.

Moreover, studies have reported that specialized training must be received before a health care student undertakes any patient procedure involving or not involving sharp devices [3]. Physicians' knowledge of SPs has been reported to be insufficient [4, 5, 6]. Few studies [3, 7, 8, 9] have reported on medical students' knowledge of SPs or sharp injuries and noted a lack of adequate knowledge of SPs. The observance of hygiene recommendations by students is reported as being weak. Medical students rarely wash their hands after examining patients [10, 11]. Poor compliance may have its roots in a failure to learn this simple, essential behavior at medical school.

Strict adherence to these SPs by health staff including students may reduce the risk of acquiring occupational infection from both known and unexpected sources in a health care setting. By implementing these guidelines, a health care worker can reduce the length of stay of a patient in the hospital and can even speed up the recovery process. Thus, assessing medical students' knowledge towards SPs will aid in the prevention of nosocomial infections and can provide the foundations for curriculum reform necessary to provide them with adequate knowledge and skills. Therefore, the study aimed to assess the knowledge, attitude & level of practice of SPs by physiotherapy students.

2. Method and Material

A cross-sectional survey-based study conveniently included 150 physiotherapy students based on the prevalence of previously published literature. The study included undergraduate (final year BPT students), post graduate students & interns from the School of Physiotherapy, D.Y Patil University, Navi Mumbai. Of the study's 150 subjects, 134 were females and 14 were males. The duration of the study was 6 months. The study was approved by the Institutional Ethics and Research Committee at the School of Physiotherapy, D.Y. Patil University. The need and procedure of this study were explained to all the participants. Informed consent was obtained before enrolling them into the study and data was collected from those who volunteered to participate.

2.1 Research Instrument

The study was voluntary, and permission was taken from the students to participate. The content of the questionnaire was explained so that each question would be understood and genuinely answered. A self-administered research questionnaire, designed after going through several questionnaires from similar published reliable studies and BMW guidelines, was formulated as a tool for data collection. The prepared questionnaire was then validated by experts. The questionnaire was administered to the participating students which included 21 questions, categorized in four domains- Domain 1 had four questions on Demographic data, Domain 2 had nine questions on knowledge regarding SPs and BMW management guidelines, Domain 3 had five questions on practice level of these precautions and waste management and Domain 4 had three questions on attitude towards these SPs and BMW management among the physiotherapy students. Most of the questionnaires had "YES, "NO" or UNCERTAIN" options. A score of >75% would be considered a good result, a range of <75%–50% was considered moderate, and anything <50% was considered poor.

3. Statistical Analysis

The data collected in the questionnaires and results were analyzed using statistical software SPSS version 23 (SPSS, Inc., Chicago, IL, USA). The qualitative variables were estimated and presented as frequencies and percentages. Descriptive statistics were performed using mean and standard deviation (SD).

4. Results

A total of 150 questionnaires were distributed, and 150 questionnaires were returned. Of the returned questionnaires all of them were valid. Therefore, 150 questionnaires (response rate, 100%) were used in the final analysis. The results obtained are described in the tables given below:

Table 1: To determine Knowledge about Standard Precautions:

Questions	Yes	No	Uncertain
Do you know what Standard Precautions are?	77.30%	2.00%	20.70%
Standard Precautions should be used in patients who are diagnosed with infection?	18.00%	76.00%	6.00%
Adherence to Standard Precautions may reduce the risk of infection only among patients?	28.00%	69.30%	2.70%

Inference

The above table shows that out of 150 subjects, 116 of the subjects know about SPs, 31 of them were uncertain and 3 of them didn't know what SPs are. Then 114 of the subjects don't think that SPs should only be used when a patient is diagnosed with infection whereas 27 of them do think that they should be followed only for the patients diagnosed with infection and 9 of them were uncertain about it. On asking whether adherence to SPs may reduce the risk of infection only among patients, 104 of the subjects disagreed whereas 42 of them agreed while 4 of them were uncertain about it.

Table 2: To determine the Knowledge about hand hygiene:

Question	5 steps	6 steps	7 steps
How many steps are involved in hand hygiene?	33.00%	39.00%	29.00%

Question	10-20 seconds	20-30 seconds	40-60 seconds
Duration of hand hygiene	17.00%	48.00%	35.00%

Inference

The table no. 2 shows that out of 150 subjects, 58 of them says that there are 6 steps in hand hygiene, 49 of them says there are 5 steps in it whereas 43 of them says that there are 7 steps in it. When asked about the duration of hand hygiene, 73 of them says that 20-30 seconds is the duration for hand hygiene while 52 of them says that 40-60 seconds are required and 25 of the subjects says that only 10-20 seconds are required.

Table 3: To determine the knowledge about Biomedical Waste management:

Question	Yes	No	Uncertain
Are you familiar with biomedical waste management guidelines?	68.00%	12.00%	20.00%

Question	Fully Correct	Partially Correct	Incorrect
Knowledge about waste disposal in color coded bags	17.00%	30.00%	53.00%

Inference

The table no. 4 shows that out of 150 subjects, 102 of the subjects were familiar with the BMW management guidelines, 30 of them were uncertain about it whereas 18 of them were not familiar with the guidelines. Out of 150 subjects, only 26 of the subjects were fully correct regarding their knowledge about waste disposal in cooler coded bags, 79 of them were partially correct and 45 of the subjects were totally incorrect.

Table 4: To determine the practice level of Standard Precautions and Biomedical Waste Management:

Questions	Yes	No	Uncertain
Wash hands/use sanitizer before and after treating patient?	99.00%	1.00%	-
Wash hands/use sanitizer after removal of gloves, if they are not soiled?	95.30%	2.00%	2.70%
Disinfect the stethoscope after treating patient?	62.70%	28.70%	8.70%
Do you share your Personal Protective Equipment (PPE)?	80.00%	20.00%	-

Inference

The above table shows that out of 150 subjects, 149 of the subjects wash hands/use sanitizer before and after treating patient while 1 of the subjects doesn't do that. On asking whether to wash hands/use sanitizer after removal of gloves, if they are not soiled, 143 of the subjects agreed to the question while 4 of them were uncertain and 3 of the subjects disagreed. Out of 150 subjects, 94 of the subjects said that they disinfect the stethoscope after treating patient, 43 subjects said that they don't disinfect their stethoscope after treating patient while 13 them were uncertain about it. On asking whether they share their PPE, 120 of the subjects don't share their PPE while 30 of the subjects do share their PPE.

Table 5: To determine attitude towards Standard Precautions and Biomedical Waste Management:

Questions	Yes	No	Uncertain
Is it necessary to follow standard precautions and biomedical waste management?	97.00%	3.00%	-
Do you think you have sufficient knowledge about standard precautions and biomedical waste management?	24.00%	42.70%	33.30%
Should there be awareness sessions held on standard precautions and biomedical management?	97.00%	3.00%	-

Inference

The above table shows that out of 150 subjects, 145 subjects agrees that it is necessary to follow SPs and BMW management guidelines while 5 of them disagrees on it. On asking that do they think they have sufficient knowledge about SPs and BMW management, 64 of them said no, 50 of them were uncertain and 36 said yes. Out of 150 subjects, 145 of the subjects think that there should be awareness sessions on SPs and BMW management and the rest doesn't want awareness sessions.

5. Discussion

In this present study, 150 subjects of which 134 females and 14 males were assessed on knowledge, practice level and attitude towards SPs and BMW management. Current study showed that 77.3% of the subjects said that they are aware about SPs and BMW management. Current study showed that our subjects had poor knowledge regarding hand hygiene i.e. about its steps and duration, only 39.00% and 35.00% of the subjects out of 150 were correct respectively. On the contrary, two studies conducted in India, one in Pune and another in Karnataka, showed high level of knowledge regarding the hand hygiene, 85.00% and 79.25% respectively [12, 13]. A study carried out in Nair showed that 54.7% of students do not wash their hands after removing gloves while on other hand, current study showed that 95.3% of subjects out of 150 do wash their hands after removing gloves [14].

A study carried out in Nepal showed that less than 50% of the subjects are aware about BMW management guidelines while on contrary, current study showed that 68.00% of subjects said that they are aware about the guidelines of BMW management [15]. A similar study conducted in Karachi, reported that 92.3% of the participants lacked knowledge regarding disposal of biomedical waste in different color coded bags, while on the other hand, current study showed that 53.00% of the subjects were totally incorrect and 30.00% of the subjects were partially correct regarding the disposal in color coded bags [16]. A study in Kuwait also showed poor practice with regards to SPs and BMW management of which only 27.7% reported correct practices which was almost similar to our study which revealed 20.00% of subjects reporting correct practices of BMW management and 37.00% of subjects reporting correct practices of SPs [17].

On average, 92.6% of subjects in a study carried in Nepal, agreed that there should be regular educational programs on SPs and BMW management which was similar to current study, in which 97.00% of subjects agreed on having awareness sessions on the same [15].

Keeping in mind about the current, COVID 19 pandemic, with which people are struggling to combat worldwide it is necessary to follow SPs guidelines regardless of the patient having infection or not, in order to reduce the transmission of such harmful and life threatening virus. Students come in contact with the patients during their clinical postings, so it is necessary for them to have adequate knowledge and

training regarding SPs before undertaking any patient procedure. Knowledge and Implementation of SPs by all health care providers including students are vital to limiting the spread of infectious disease. Health care associated infections as well as occupational infections can be reduced to a great extent just by strictly adhering to SPs guidelines.

6. Conclusion

The present study concluded that the students were aware about the SPs and BMW management but had poor knowledge as well as practice level about the same. The study also showed that students find it necessary to follow the guidelines but have insufficient knowledge about the same and agreed on having awareness sessions.

7. Limitations

The questionnaire should have included one question on the source from where the students came to know about SPs guidelines and other question on which type of awareness they would prefer. If that question was included then perhaps it would have been easier to decide on, as to which type of awareness sessions should be held. For example, through seminars, including the topic in syllabus, sharing articles and links regarding this topic and putting up posters on this topic in wards and/or college.

8. References

1. World Health Organization. Report on the burden of endemic health care-associated infection worldwide.
2. World Health Organization. Practical Guidelines for Infection Control in Health Care Facilities. WHO: Geneva, 2004.
3. Elliott SKF, Keeton A, Holt A. Medical students' knowledge of sharps injuries. J Hosp Infect. 2005;60:374-377.
4. Sax H, Perneger T, Hugonnet S, Herrault P, Chraïti MN, Pittet D. Knowledge of standard and isolation precautions in a large teaching hospital. Infect Control Hosp Epidemiol. 2005;26:298-304.
5. Bryce EA, Scharf S, Walker M, Walsh A. The infection control audit: the standardized audit as a tool for change. Am JInfect Control. 2007;35:271-283.
6. Easton PM, Sarma A, Williams FLR, Marwick CA, Phillips G, Nathwani D. Infection control and management of MRSA: assessing the knowledge of staff in an acute hospital setting. JHosp Infect. 2007;66:29-33.
7. Askarian M, Honarvr B, Tabatabaee HR, Assadian O. Knowledge, practice and attitude towards standard isolation precaution in Iranian medical students. JHosp Infect. 2004;58:292-296.
8. Mann CM, Wood A. How much do medical students know about infection control? J Hosp Infect. 2006;64:366-370.
9. Koenig S, Chu J. Senior medical students 'knowledge of universal precautions. Acad Med. 1993;68:372-374.
10. Feather A, Stone SP, Wessier A, Boursicot KA, Pratt C.' Now please wash your hands': the hand washing behavior of final MBBS candidates. JHosp Infect. 2000;45:62-64.
11. Hunt DCE, Mohammudaly A, Stone SP, Dacre J. Hand hygiene behaviour, attitudes and beliefs in first year clinical medical students. J Hosp Infect. 2005;59:371-373.
12. Anargh V, Singh H, Kulkarni A, Mahen A. Hand hygiene practices among health care workers in a tertiary care facility in Pune. Med J Armed Forces India. 2013, 54-6.
13. Kulkarni V, Papanna MK, Mohanty U, Ranjan R, Neelima V, Kumar N, *et al*. Awareness of medical students in a medical college in Manglore, Karnataka, India concerning infection prevention practices. J Infect Public Health. 2013;6:261-8.
14. Nair S, Hanumantappa R. Hiremath among medical and nursing students at a tertiary health care centre in Raichur, India. ISRN Prev Med. 2014, 1-4.
15. Tanuja Singh, Tika R. Ghimire, Santosh K. Agarwal. Awareness of biomedical waste management in dental students in different dental colleges in Nepal, 2018.
16. Fatima Sharif, Aysha Khan, Muhammad Adeel Samad, *et al*. Knowledge, attitude, and practices regarding infection control measures among medical students in Karachi, 2016.
17. Karim J, Al-Saraji M, Al-Mousawi F. Knowledge and self-reported practice of universal precautions among Kuwait university medical students in their clinical years. Med Princpract. 2012;21:328-33.
18. Priya Datta, Gursimran Kaur Mohi and Jagdish Chander. Biomedical Waste Management in India: Critical Appraisal, 2016.