

ORIGINAL ARTICLE**Assessment of Knowledge and Practices Regarding Infection Control During COVID-19 Amongst Healthcare Professionals in a Tertiary Care Hospital, Pakistan**Shazia Naqvi¹, Saad Jawaid², Abdul Sattar³, Rabya Shah⁴**Authors Affiliation:**Department of Emergency Medicine, Shifa International Hospital, Islamabad^{1,2,3}Department of Pediatrics, Shifa International Hospital, Islamabad⁴Emergency department, Shifa international hospital Islamabad^{4&6}**Correspondence to:**Shazia Naqvi
shaziabatoonaqvi@gmail.com**ABSTRACT****OBJECTIVE**

To assess the knowledge and practices of infection control measures of health-care professionals during the covid-19 pandemic.

METHODS

This was a cross-sectional study of 177 health-care professionals of a tertiary care hospital during the Covid-19 pandemic 2020. A questionnaire was distributed to various categories of hospital staff of different departments. The questionnaire included items on knowledge, self-reported practice, and general items of infection control. Scores were calculated for each item of each individual.

RESULTS

The median knowledge scores were 19 (6 – 24), 16 (5 – 24), and 21 (9 – 24) for physicians, nurses/nursing assistants, and paramedical staff respectively. The median practice scores were 22 (4 – 30), 22 (7 – 30), and 25 (8 – 30) for physicians, nurses/nursing assistants, and paramedical staff respectively. The median general measures scores were 8 (4 – 11), 9 (6 – 11), and 9 (7 – 11) for physicians, nurses/nursing assistants, and paramedical staff respectively. Most of the

health-care workers feel a need for a class/training session for covid-19 prevention. Self-reported duration of hand hygiene was less than 20 seconds in 16.4% of health-care workers and the leading reasons for non-compliance with the duration of hand hygiene was that they don't have enough time (79.4%), while 20.6% of health-care workers think it interferes with patient care.

CONCLUSION

All categories of healthcare workers showed good to adequate knowledge, self-reported practice, and general measures for infection control. However, the wide range of individual scores shows that the knowledge and practice of healthcare workers are not consistent. Most staff wanted further classes and training, emphasizing the need for constant reassessment and education. Gaps in hand hygiene still need to be addressed.

KEYWORDS

Safety precautions, Health-care professionals (HCP), Personal protective equipment (PPE), Covid-19 pandemic.

INTRODUCTION

The novel coronavirus infection emerged in Wuhan, China in December 2019 and spread globally in the next few months.⁽¹⁾ The covid 19 pandemic is a model for how fast an infection can spread. As the number of patients increased, healthcare systems were overwhelmed in many countries.⁽²⁻⁵⁾ Healthcare professionals were infected due to unprotected close contact with patients. HCPs are at increased risk of exposure in triage areas of emergency departments, dealing with covid suspected or confirmed cases in the red zone for coronavirus in hospital, during aerosol generating procedures like suctioning, nebulization, endotracheal intubation, and during CPR.

An effective or safe vaccine for covid 19 infections is not yet available. Safety measures for HCPs are therefore of utmost importance. Infection control measures that have evolved must be escalated and enhanced. Adequate personal protective equipment (PPE) should be available along-with training for its use.⁽⁶⁾ Abundance of masks (surgical and N95), gloves, gown, sanitizer, and hazmat suits are required. Education of health professionals for strict hand hygiene, physical distancing, isolation of patients, and early recognition⁽⁷⁾ of contacts is of paramount importance during this pandemic. Furthermore, good practice and strict adherence to infection control guidelines are necessary for

containment of the pandemic.

The safety of HCPs and their families is of great importance as is evident by the increasing number of deaths of healthcare workers globally.⁽⁸⁾ Also worth considering is the risk to vulnerable patients that are exposed to healthcare workers that are asymptomatic carriers of infection.⁽⁹⁾ Safety measures for infection prevention and control can limit spread and help contain infection during the pandemic.

METHODS

This cross-sectional study was conducted from June 2020 to August 2020 during the covid-19 pandemic in Shifa International Hospital, a tertiary care hospital in Islamabad, Pakistan.

DATA COLLECTION

A questionnaire consisting of a section each on knowledge, practice, and general items were used for data collection. It was adapted from the hospital guidelines given for infection control. Similar questionnaires have been used by research teams in other settings.⁽¹⁾ The questionnaire was piloted with hospital staff for face validity. After the initial pilot study with 20 respondents in the emergency department, a few modifications were made. Data from the pilot study were not included in the final analysis. The questions had close response alternatives where the participant could select one or more alternatives as instructed.

Questionnaires were distributed to hospital staff, ensuring to recruit staff with different qualifications (physicians, nurses/nursing assistants, and housekeeping staff) from various departments. The questionnaires were then collected and assessed for data quality. Finally, 177 questionnaires were included in the analysis.

DATA ANALYSIS

Each question was given a score from 0 to 1. A correct answer was given a score of 1 while 0 was given to an incorrect response. Knowledge, practice, and general item scores for each individual were calculated and summed up to attain the total score. The total score for knowledge items was 24, for practice items 30, and general items 11.

STATISTICAL ANALYSIS

Descriptive statistics were used to present participants' demographic characteristics. Numerical variables were expressed as medians (including the range) while categorical variables were measured as percentages. All analyses were performed on SPSS version 23.

ETHICAL APPROVAL: The study was approved by the Institutional Review Board and Ethics Committee (IRB and EC) on 16 May 2020.

DATA AVAILABILITY: The data sets generated during and/or analyzed during the current study are available from the author on reasonable request.

RESULTS

DEMOGRAPHIC CHARACTERISTICS: The study participants' demographic characteristics are described in Table 1. Mean age was 27.8 ± 5.8 years, with females being the dominant sex (52.5%), and physicians being the dominant qualification group (50.8%) followed by nurses/nursing assistants (40.7%) and paramedical staff (8.5%).

STAFF'S KNOWLEDGE, SELF-REPORTED INFECTION CONTROL PRACTICES, AND GENERAL MEASURES: Staff's knowledge, self-reported infection control practices, and general measures are presented in Table 2.

Knowledge: The median knowledge scores were 19 (6 – 24), 16 (5 – 24), and 21 (9 – 24) for physicians, nurses/nursing assistants, and paramedical staff respectively. Among, physicians and paramedical staff the majority of respondents showed good knowledge (physicians: 30.5%, paramedical staff: 4.5%) while among nurses/nursing assistants the majority showed adequate knowledge (19.2%).

Self-reported infection control practices: The median practice scores were 22 (4 – 30), 22 (7 – 30), and 25 (8 – 30) for physicians, nurses/nursing assistants, and paramedical staff respectively. Most staff scored good practice scores range among all professions (physicians: 20.3%, nurses/nursing assistants: 18.6%, and paramedical staff: 5.6%).

General measures: The median general measures scores were 8 (4 – 11), 9 (6 – 11), and 9 (7 – 11) for physicians, nurses/nursing assistants, and paramedical staff respectively. Among, nurses/nursing assistants and paramedical staff the majority of respondents showed good general measures (nurses/nursing assistants 27.1% and paramedical staff: 5.6%) while among physicians the majority showed adequate general measures (27.1%).

Most of the health-care workers feel a need for a class/training session for covid-19 prevention (Fig 1). Self-reported duration of hand hygiene was less than 20 seconds in 16.4% of health-care workers and the leading reasons for non-compliance with a duration of hand hygiene was that they don't have enough time (79.4%), while 20.6% of health-care workers think it interferes with patient care.

DISCUSSION

During the covid 19 pandemics, the Infection Control Department of our hospital prepared meticulous guidelines for HCPs. Written and visual material for PPE guid-

ance was provided along-with posters in clinical areas. While the study was going on, zoom sessions were held as well as formal classes for HCPs. Distinct PPE guidelines had been given for hyper-triage, ER red zone, non-covid and covid areas, general patient interaction, interaction with the respiratory patient, and during aerosol generating procedures. HCPs and patients were advised to wear a face mask at all times, keep a distance of 1 meter during patient interaction, and avoid unnecessary visits to covid areas. Cough etiquette was emphasized.

We conducted this study to identify the current knowledge and practice of the hospital doctors and staff according to guidelines provided by the hospital. Our study included different healthcare workers (physicians, nurses/nursing assistants, and paramedical staff) in various departments (emergency department, medical ICU, surgery, dialysis unit, pediatric ICU, neonatal ICU, pediatric department.)

Physicians and paramedical staff showed good knowledge while nursing staff showed adequate knowledge. This can be explained by guidelines given by the hospital for infection control. Nonetheless, some staff still showed poor knowledge and the knowledge score was wide, indicating the need for continuing professional development.

Self-reported practice scores were good for all categories of healthcare workers.

The general measure scores were good for nursing staff and paramedical staff while adequate for physicians.

Among the staff, cleaners had good scores in knowledge, practice, and general measures. These results are in contrast to another study conducted in Vietnam⁽¹⁰⁾ in which cleaners had lower scores than physicians and nurses. This is probably due to rigorous teaching and training especially for housekeeping in our hospital. Housekeeping has 2 sessions every week for teaching and practice guidance for infection control measures during the pandemic. The role of cleaning staff in hospital infection control is usually underestimated although they and their work can be a vector of infection transmission in hospitals. Cleaning itself can be an important intervention in controlling HAIs in hospitals.

Almost 70% of the staff felt a need for classes and training for covid-19 prevention. Although clear written guidelines had been given by the hospital infection control department, most staff wanted classes and hands-on training.

Self-reported duration of hand hygiene was less than 20 seconds in 16.4% of health-care workers and the leading reasons for non-compliance with a duration of hand

hygiene was that they don't have enough time (79.4%), while 20.6% of health-care workers think it interferes with patient care. The staff considered emergencies and high workload the main reasons for their non-compliance. In emergencies, patients require rapid assessment and intervention although these sick patients are more vulnerable to infection if hospital staff does not follow standard operating procedures for hygiene. The high workload is often due to high patient influx. Making alcohol-based hand rub more readily available, for example at the patient's bedside or in the staffs' pockets, would make its use more feasible whenever needed.

Although good knowledge is a pre-requisite for a successful infection control program, it does not necessarily guarantee good practice. The know-do gap in infection control practice has been reported previously in various studies from LMICs for example Ethiopia and Nigeria.⁽¹¹⁻¹³⁾ Furthermore, a possible difference between the staff's self-reported practice and their actual practice might need to be considered in future infection control strategies.

This study's strength lies in the fact that it was conducted with hospital staff of varying qualifications and departments, providing a more diverse perspective on the topic.

LIMITATIONS

Our study was conducted in an urban tertiary- care hospital. It was a single center study. Further studies involving multiple hospitals in urban and rural settings can be done. Also, direct observation of actual practices of HCPs might be more accurate than self-reported practices.

CONCLUSION

All categories of healthcare workers showed good to adequate knowledge, self-reported practice, and general measures for infection control. Most staff wanted further classes and training emphasizing the need for constant reassessment and education. Gaps in hand hygiene still need to be addressed.

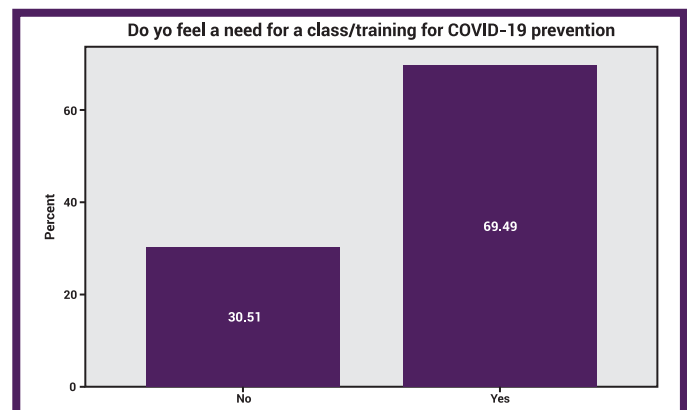


Figure 1

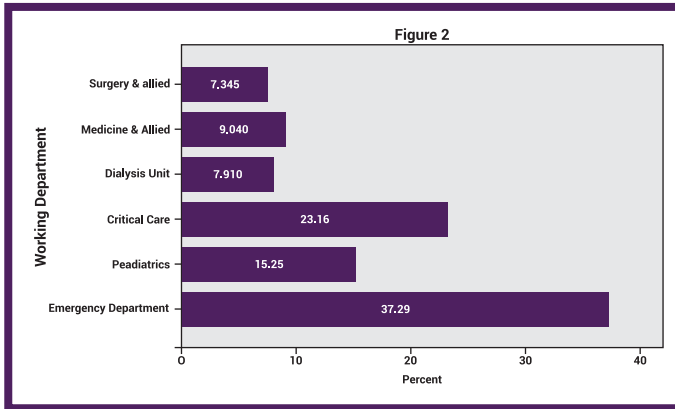


Figure 2

Characteristics	Total (N = 177) n (%)
Age (27.8 ± 5.8)	n = 177
16 – 25	78 (44.1)
26 – 35	81 (45.8)
36 – 45	14 (7.9)
46 – 55	3 (1.7)
56 – 65	1 (0.6)
Sex	n = 177
Male	84 (47.5)
Female	93 (52.5)
Qualification	n = 177
Physicians	90 (50.8)
Nurses / Nursing assistants	72 (40.7)
Paramedical staff	15 (8.5)
Working Department	n = 177
Accident & Emergency	66 (37.3)
Pediatrics	27 (15.3)
Critical care	41 (23.2)
Dialysis unit	14 (7.9)
Medicine & allied	16 (9)
Surgery & allied	13 (7.3)

Table 1. Study participant's demographic characteristics.

Assessment	Physicians	Nurses / Nursing assistants	staff
Knowledge score (median) (range)	19 (6 – 24) n (%)	16 (5 – 24) n (%)	21 (9 – 24) n (%)
Poor knowledge	22 (12.4%)	15 (8.5%)	3 (1.7%)
Adequate knowledge	14 (7.9%)	34 (19.2%)	4 (2.3%)
Good knowledge	54 (30.5%)	23 (13%)	8 (4.5%)
Practice score (median) (range)	22 (4 – 30) n (%)	22 (7 – 30) n (%)	25 (8 – 30) n (%)
Poor practice	26 (14.7%)	9 (5.1%)	2 (1.1%)
Adequate practice	28 (15.8%)	30 (16.9%)	3 (1.7%)
Good practice	36 (20.3%)	33 (18.6%)	10 (5.6%)
General measures score (median) (range)	8 (4 – 11) n (%)	9 (6 – 11) n (%)	9 (7 – 11) n (%)
Poor general measures	6 (3.4%)	0	0
Adequate general measures	49 (27.7%)	24 (13.6%)	5 (2.8%)
Good general measures	35 (19.8%)	48 (27.1%)	10 (5.6%)

Table 2. Staff knowledge, self-reported infection control practice and general measures score.

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