

Knowledge, attitude and practice among healthcare professionals regarding the use of personal protective equipment at tertiary care hospitals in Peshawar

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ABSTRACT

Background: Personal protective equipment is designed to safeguard healthcare workers and patients from potential risks during healthcare activities. The proper utilization of PPE serves as a crucial strategy for mitigating the transmission of infections within healthcare settings, thereby minimizing the risk of both healthcare-associated infections and community spread. In this study we tried to explore and assess the knowledge, attitude and practice of healthcare professionals regarding use of Personal protective equipment (PPE).

Methods: A cross-sectional study was conducted at Northwest General Hospital (a private sector tertiary healthcare hospital) and Hayatabad Medical Complex (a public sector tertiary care hospital) from March to August 2023. Data was collected from 260 healthcare workers i.e. Doctors and Nurses from both institutions through a preformed questionnaire containing a total of 27 questions.

Results: There was a slight positive correlation between increasing years of practice and knowledge regarding PPE (Pearson correlation = 0.017). There was a slight positive correlation between increasing years of practice and attitude (Pearson correlation = 0.035). There was a positive correlation between increasing years of practice and practice of PPE (Pearson correlation=0.147), and there was also a significant association (0.018) between increasing years of practice and practice of PPE

Conclusion: Study shows that the healthcare professionals have good knowledge and attitude regarding use of PPE, but there are still gaps in practicing PPE.

Keywords: Healthcare Delivery, Personal Protective Equipment, Knowledge, Attitude, and Practice

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Introduction

In recent times, the global healthcare landscape has witnessed an unprecedented

surge in the significance of personal protective equipment (PPE) as a fundamental line of defense against infectious diseases. The healthcare systems around the world grappled with the rapid spread of the COVID-19 pandemic, the spotlight on PPE's essential role in safeguarding healthcare workers and patients became glaringly apparent. Among the various healthcare settings, tertiary care hospitals stand as

pivotal institutions responsible for addressing complex medical cases and infectious disease outbreaks.

Using PPE is initial approach to stop disease transmission in hospitals. Knowledge reveals healthcare professionals' preparedness to take interest in wearing PPE (1). Sufficient knowledge, well behavior, and genuine application of PPE by healthcare professionals is important for protection from communicable diseases (2).

Health Care Workers (HCWs) can make safe themselves from getting infection by coating most of the body. Beside good knowledge and positive attitude the healthcare professionals should expertise the wearing and putting off of PPE (3). Healthcare professionals are at high risk of getting infections as they are first to expose to various new infections, because of which they may suffer from anxiety, depression, and may feel mentally exhausted which may affect the quality health services (4). The governing policies in healthcare systems are badly affected due to excess load of patients on healthcare system which has led to insufficient supply, inappropriate implementations and usage of personal protective equipment (5). The healthcare professionals do not have enough knowledge associated with communicable diseases and handling of infectious products which compels them to ill-suited practices and lead them to fear of getting infections, and disease management are badly affected (6). Proper implementation of PPE based on safety guidelines are proven to reduce the risk of getting infection in health system which lead to increase efficiency and reduced anxiety and depression in healthcare workers (7). The chances of infection can be reduced in healthcare systems by following safety guidelines, proper wearing of PPE, proper

hand sanitization and isolation of patients with communicable & infectious diseases. The disappointments of healthcare workers related to unavailability of PPE can be relieved by easy access (8). Knowing the importance of PPE, the healthcare workers have positive approach toward using PPE but they are still not properly practiced (9, 10).

Against this backdrop, it becomes imperative to delve into the knowledge, attitudes, and practices of healthcare professionals with regard to PPE usage within such settings.

In conclusion, the focal point of this research lies in understanding the intricate dimensions of healthcare professionals' knowledge, attitudes, and practices concerning PPE utilization in tertiary care hospitals in Peshawar. By addressing these dimensions, this study aspires to illuminate critical insights that contribute to bolstering infection prevention measures, ensuring the well-being of healthcare providers and safeguarding the health of patients within these healthcare settings.

Methods

It was a cross-sectional study conducted at Hayatabad Medical Complex (HMC) and Northwest General Hospital (NWGH) from March 2023 to August 2023. Sample size was calculated using openepi software. The sample size calculated was 260. Simple random sampling was used for data collection. Data was collected after approval of Institutional Ethical Review Board (Ref: IRB&EC/2023-SM/027) and obtaining permission from relevant institution (study settings). Informed consent was taken from the participants. The objective of the study was to assess knowledge, attitude and practice of healthcare professional regarding use of PPE.

The knowledge portion contains 8 questions, and each question was answered in 'Yes' or 'No'. The yes answer was noted as one, while the no option was given zero. The total score range from 0 to 8. The scoring of ≤ 5 for poor knowledge and ≥ 6 for good knowledge was set on.

Attitude part was consists of 9 questions, and the answer of each question was noted on a 5-point Likert scale as come after: strongly agree (5 points), agree (4 points), neutral (3 points), disagree (2 points), and strongly disagree (1 point). The total points extend from 9 to 45, the mean score for attitude was ≥ 35.26 showing a positive attitude for practicing PPE. The practice part was consisted of 10 questions, and each question was answered in: Yes (1 point) and No (0 point).

The total points for the practice extend from 0 to 10. 7-10 points indicated good practice

and of 1-6 tell about poor practice for using PPE during work time.

Descriptive analysis was carried out for demographic variables. To determine the normality of the data, the mean and standard deviation were calculated for significant variables. Inferential statistics were calculated for different domains of the level of knowledge, attitude, and practice of healthcare professionals regarding the use of PPE.

Results

Knowledge

The contributors from the healthcare professionals were inquired for their knowledge regarding the use of personal protective equipment in hospital settings.

Table 1: Knowledge

Questions regarding knowledge	Answer	
	Yes	No
Do you know how to wear PPE?	209 80.4%	51 19.6%
Do you know that following are the parts of personal protective equipment (PPE): face mask, Gown, Apron, gloves, Face shield?	234 (90%)	26 10%
Do you know hand sanitization is important beside other PPE components for controlling infections?	240 92.3%	20 7.7%
Do you know steps for wearing and removing of PPE accurately?	199 76.5%	61 23.5%
Do you know importance of PPE in protecting yourself and patients?	220 84.6%	40 15.4%
Do you know all the elements of PPE are needed to wear while direct interaction with patients?	201 77.3%	59 22.7%
Do you think it is important that attendants of patients should also wear PPE?	235 90.4%	25 9.6%
Do you believe all the elements of PPE are necessary while curing the patients with infectious diseases at the emergency and critical care units?	196 75.4%	64 24.6%

A detailed analysis of the knowledge was done. The mean score in knowledge was 6.67 (maximum possible: 8), with a standard deviation of 1.3. 93 (35.8%) scored 8 out of 8

in knowledge. 62(23.8%) scored 7 out of 8, 50(16.2%) scored 6 out of 8, and 24.2 percent scored 5 or lower.

The mean score in knowledge for doctors was 6.8 (SD=1.2) while for the nurses the mean score was 6.3 (SD=1.4). Chi square test pointed that there is no association between knowledge and profession (p=0.16). There was also no significant association between knowledge and gender (p=0.08). There was a slight positive correlation between increasing years of practice and knowledge regarding PPE (Pearson correlation = 0.017)

Attitude

The contributors from the healthcare professionals were inquired for their attitude regarding the use of personal protective equipment in hospital settings. The table displays how medical professionals feel about using PPE

Table 2: Attitude

	Strongly Agree	Agree	Neutral	Disagree	Strongly Agree
Do you believe wearing and removing of PPE is important process that must be not ignored by health-care professionals?	140 53.8%	89 34.2%	27 10.4%	2 0.4%	2 0.4%
Are you strict to accurate way of wearing PPE?	76 29.2%	106 40.8%	68 26.2%	10 3.8%	0
Do you think other safety measures are also important beside PPE?	112 43.1%	99 38.1%	42 16.2%	7 2.7%	0
Do you believe that practicing PPE is more sensitized than it should be?	44 16.9%	89 34.2%	89 34.2%	31 11.9%	7 2.7%
Do you feel uneasy after wearing PPE and feel difficult to treat patients?	62 23.8%	91 35%	66 25.4%	39 15%	2 0.8%
If proper PPE is provided you are eager to treat patients with contagious diseases?	140 53.8%	75 28.8%	33 12.5%	9 3.5%	3 1.2%
You feel satisfied with your current PPE.	61 23.5%	96 36.9%	63 24.2%	37 14.2%	3 1.2%
Do you believe your healthcare setting have all resources necessary for accurate practice of PPE?	72 27.7%	77 29.6%	61 23.5%	42 16.2%	8 3.1%
Do you believe that if your colleague does not rightly use PPE you working efficiency is affected?	88 33.8%	90 34.6%	56 21.5%	24 9.2%	2 0.8%

A detailed analysis of the attitude was done. The mean score in attitude was 35.26 (maximum possible: 45), with a standard deviation of 4.5. 38 (14.6%) scored 25 to 30 in attitude. 104 (40%) scored 31 to 35, 76 (29.2%) scored 36 to 40, while 42(16.2 percent) had highest positive attitude range from 41 to 45.

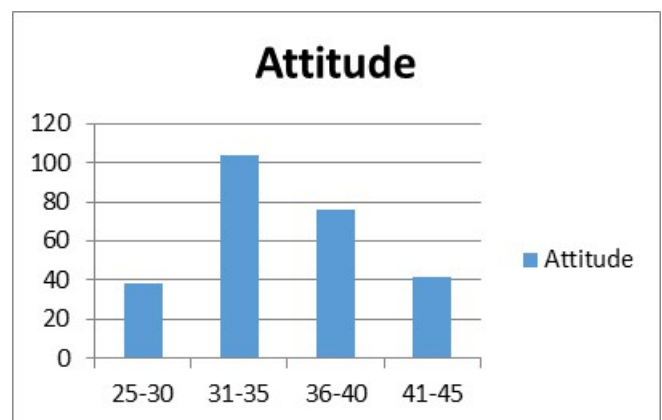


Figure: Attitude

The bar chart showing number of healthcare professional and their attitude score ranging from 25 to 45

The mean attitude score for doctors was 35 while for nurses was almost similar (35.7). Chi square test demonstrated that there was no meaningful correlation between the participants' attitude level and their profession. ($p = 0.49$) and association between gender and attitude was also non-significant ($p= 0.56$). There was slight positive

Table 3: Practice

Questions regarding practice	Answer	
	Yes	No
I always examine integrity of the PPE kits before wearing PPE.	215 82.4%	45 17.6%
I always wear the apron first before wearing first pair glove	196 75.4%	64 74.6%
I take face shield after using N95 mask.	190 73.1%	70 26.9%
I always assign a staff member with checklist after removing PPE to avoid any mishap.	168 64.6%	92 35.4%
Are you using reusable PPE?	134 51.5%	26 48.5%
I always put off gloves first during removing using glove-in-glove technique.	195 75%	65 25%
I always remove inner pair of gloves before removing apron.	182 70%	78 30%
I remove the gown back to front during removal to carefully pack the affected side.	202 77.7%	58 22.3%
I leave the changing room after removing PPE.	215 82.7%	45 17.3%
I sanitize my hands in every step of removing PPE.	258 99.2%	2 0.8%

A detailed analysis of the Practice was done. The mean score in practice was 7.51 (maximum possible: 10), with a standard deviation of 1.68.

37 (14.2%) scored a perfect 10 out of 10 in practice. 43(16.5%) scored 9 out of 10, 58(22.3%) scored 8 out of 10, 48 (18.5) scored 7 out of 10, 42 (16.2%) scored 6 out of 10 while the other 32 (12.3%) percent scored 5 or lower. Showed in table below

correlation between increasing years of practice and attitude (Pearson correlation = 0.035)

Practice

The contributors from the healthcare professionals were asked about their practice regarding personal protective equipments in hospital settings. The following table displays how healthcare workers use PPE.

The mean practice score for doctors was 7.4 while for nurses was almost similar (7.74). Chi square test showed. That there was no meaningful association between the profession and practice level of the participants. ($p= 0.45$) and association between gender and practice was also non-significant ($p= 0.82$). There was positive correlation with increasing years of practice and practice of PPE (Pearson correlation=0.147) and there was also

significant association (0.018) between increasing years of practice and practice of PPE.

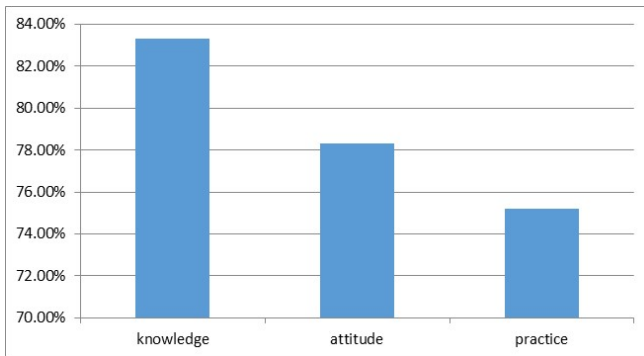


Figure 1: Percentage of knowledge, attitude & practice

Figure 1 shows mean percentages of knowledge, attitude, practice which are 83.3%, 78.3% and 75.2% respectively.

Discussion

Our study revealed that 83.3% healthcare professionals have good knowledge regarding use of PPE while 78.3% have positive attitude toward use of PPE, while 75.2% of healthcare worker had proper practice of PPE. In our study it was found that there was no correlation between knowledge, attitude, practice and demographic variable except age factor & experience which had slight association with knowledge, attitude and practice.

The results of this study are somewhat comparable to a study conducted in Jordan, which showed that most of the healthcare professionals had enough knowledge (81.4%), positive attitude (87.1%), and proper practice (77.9%). Knowledge had strong association with attitude and practice ($p < .01$), and attitude had correlation with practice ($p < .01$) (11).

Our study results are contradictory to a study conducted in Jordan. Overall, 69% had good knowledge, 21% had positive attitude, and

74% was properly practicing PPE during COVID-19 pandemic. Healthcare workers greater than 40 years age had good practice of PPE (12).

A study conducted in 2020 discovered that Health-care workers (HCWs) know the significance and high concern of wearing and removing the personal protective equipments, but they don't have enough the knowledge about transmission of infection as 62% answered that infection transmission occurs more during putting on than putting off of PPE. In attitude desperation was found as 51% of HCWs was feeling uneasy after wearing PPE that lead healthcare workers to compromise on their own protection from infections. About 33.5% of HCWs leave the changing room of PPE without putting off gloves and masks, which is of high concern in controlling transmission of infections (13). In our survey 76.5% of healthcare professional know wearing and removing of PPE correctly and 89% showed serious attitude toward wearing and removing of PPE.

In our study it was found that 58.4% healthcare professionals feel uneasy after donning PPE. 19.3% healthcare professionals thinks that there facility is not adequately equipped with PPE, while a study in Vietnam showed that 89.6% of HCWs found it difficult to practice safety measures likethey feel resistant to change their improper practice (56.4%), some HCWs was not satisfied of their personal protective equipment (PPE) (40.0%), and for (14.4%) HCWs it was difficult to practice PPE (14).

It is discovered in our study that the majority of healthcare workers thinks that their behavior was affected by their colleague if they do not properly use PPE, while some of the healthcare professionals were also conscious about adequate supply of PPE. a

study from Bangladesh concluded that poor availability of PPE, terror of being infected, HCWs was also cautious for their family member as they may get infection which lead them to depression, anxiety and other psychological issues beside all these situation they were ready to serve humanity and provide good care to their patients (15).

Almost all the healthcare workers were sanitizing their hands after each step of donning and doffing. A study conducted in china discovered that most healthcare professionals (96.1%) were sanitizing their hands regularly (16).

In our study, it was found that the behavior of the majority of healthcare professionals was affected if their colleagues didn't use proper PPE and if they were not provided with proper PPE and they had a fear of getting infections. The US.NEWS reported in 2020 that the limited supply of PPE to healthcare professionals had led them to anxiety (17).

In our study it was finding that healthcare professionals had good knowledge, positive attitude but somewhat less practice of PPE. There should be proper training which give emphasize on importance , donning and doffing of PPE.A study conducted before concluded that, The use of personal protection equipment is now considered standard of care for medical professionals. The COVID-19 pandemic changed the healthcare industry in a number of ways, one of which is the increasing focus on health professionals' safety when there are communicable diseases present. PPE has been demonstrated to stop the transmission of illness and protect the health of certain practitioners. All healthcare companies must adhere to a standard set by following the PPE usage recommendations. For PPE to be effective, proper training is required,

including instructions on how to put on and take off PPE (18).

Conclusions

This study shows that healthcare professionals have good knowledge and positive attitude towards using PPE. Knowledge, attitude, and practice have a positive correlation with experience with increasing age. There are still gaps in the practice of PPE due to inconvenience after donning and most of the healthcare professionals think that putting on and putting off of PPE are more exaggerated than they should be. Healthcare management institutions should arrange proper training seminars to help healthcare professionals protect themselves and their patients from infectious diseases.

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- B. Active Participation in Active Methodology
- C. Interpretation/ Analysis and Discussion