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Original Research Article

A cross-sectional study on knowledge, attitude, and practices of donning and doffing of personal protective equipment: an institutional survey on interns during the COVID-19 pandemic

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ABSTRACT

Background: Personal protective equipment (PPE) is a physical barrier that healthcare workers (HCW) wear to stop the transmission of a pathogen from a pathologic specimen or a confirmed or suspected case. It prevents the spread of disease from patient to HCWs as well as the other way around. Eyewear, face shield, surgical mask, particulate respirators, glove, disposable gowns and boots, and head coverings are some examples of these physical barriers. The primary objective of the study is to assess the knowledge, attitude and practices (KAP) of interns towards appropriate use of PPE and secondary objective is to find the role of training on donning and doffing of PPE of interns towards appropriate use of PPE.
Methods: This is an institutional based, analytical cross-sectional study. Data was collected from interns (n=130) posted in COVID-19 ward using a universal sampling method. A predesigned questionnaire was used for study. The data was analyzed using SPSS 26 trial version
Results: Interns were aware of the importance and criticality of donning and doffing procedure, overall level of KAP of donning and doffing of PPE were 96.90%, 73.10% and 86.20% respectively. We found that there was statistically significant mean difference between the KAP scores with respect to training of PPE.
Conclusions: There were some gaps in KAP at institutional level among the interns with regards to donning and doffing of PPE during the beginning of this pandemic.

Keywords: Attitude, COVID-19, Donning and doffing, Knowledge, Practice, Personal protective equipment, Interns

INTRODUCTION

The world health organization (WHO) classified corona virus disease 2019 (COVID-19), a fatal respiratory illness characterized by SARS corona virus-2 (SARS CoV-2), a global pandemic on March 11, 2020.[1,2] About 40 million cases more than 1 million fatalities associated with COVID-19 were documented globally as of October 21st, 2020.[3] The disease is anticipated to persist because of transmission from asymptomatic people. As a result, frontline HCW are constantly needed to handle COVID-19 patients, making them the population most at risk of contracting the disease. HCWs make up about 14% of individuals afflicted, according to WHO estimates.[4,5]

The recommendation that healthcare personnel wear PPE is one of the essential elements of infection and preventive control (IPC) for the management of COVID-19 (HCWs).[5] Considering that HCWs have a higher chance of getting the disease, this element serves as a protection.[6,7] PPE is a protective shield worn by HCWs to stop the transmission of a pathogen from a pathologic

specimen or a confirmed or suspected case. It prevents the spread of disease from patient to HCWs as well as the other way around. Spectacles, face guards, fluid-resistant surgical or medical mask, particulate respirators (like N95 respirators), disposable gowns and coveralls, heavy-duty apron, waterproof boots, and hoods or head coverings are some examples of these physical barriers that can be used in combination with other IPC techniques.[6,8,9]

The appropriate donning and doffing of PPE as well as awareness of their use provide considerable challenges. In this sense, any error could be harmful.[10]

The usage of PPE has been noted as one of the major physical and mental challenges encountered by doctors while reacting to COVID-19.[11]

Any habit might be difficult to practice if an individual does not have the right attitude toward it. Furthermore, a person's attitude toward any practice is useless if they lack accurate and useful understanding about how to engage in it. This is the primary compelling justification for carrying out this KAP survey on donning and doffing practices of PPE in the midst of the ongoing COVID-19 pandemic in order to recognize and comprehend the gaps and create an intervention strategy to enhance the knowledge level, attitude, and behaviour of HCWs regarding donning and doffing practices of PPEs.

Aim and objectives

The primary objective of the study is to assess the KAP of interns towards appropriate use of PPE and secondary objective is to find the role of training on donning and doffing of PPE of interns towards appropriate use of the PPE.

METHODS

Study design

Study design was an institutional based cross-sectional study.

Study area

Study was conducted at Alluri Sitarama Raju academy of medical sciences (ASRAM) of West Godavari District, Andhra Pradesh.

Study period

Study conducted for thirty days (1st September 2020 - 30th September 2020).

Study population

All interns present in ASRAM college of West Godavari district.

Sample size

All interns present in ASRAM college i.e., 150. Out of 150, 20 were excluded, so the sample size was 130.

Study tools

A predesigned and pretested questionnaire was used for collecting the data after validating the questionnaire. Questionnaire was developed in English language. Questionnaire contained six questions on the knowledge, eight questions on Attitudes and seventeen questions on practices. Each question contains two options i.e., yes or no. So, the minimum and maximum scores of KAP were zero and six, zero and eight and zero and seventeen respectively. Of the total score less than or equal to 50 % was taken as the study subjects having inadequate knowledge, negative attitude, bad practice and a total score greater than 50% was taken as the study subjects having adequate knowledge, positive attitude, good practice.

Inclusion criteria

Interns who were willing to participate and have consent were included in the study.

Exclusion criteria

Interns who were on leave during the period of data collection and interns who were COVID positive and were in isolation were excluded.

Data analysis

The collected data was entered in Microsoft excel 2007 and analyzed using SPSS version 26 software, trial version. Data was described in terms of mean ± standard deviation, frequencies as appropriate. Chi-square test and t test were done wherever necessary. The results were presented in the form of charts, graphs, etc. P value less than 0.05 was taken as statistically significant

Ethical issues

Clearance from the institutional ethical committee was obtained prior to the start of the study. Verbal consent was taken beforehand for their participation.

RESULTS

A total of 130 responses were taken in which there was 100% response rate. The study included 94 female and 36 male interns represented in Figure 1.

Knowledge about donning and doffing of PPE was assessed in which only 33.10% had undergone training or demonstration regarding donning and doffing of PPE kits. Most of them i.e., 98.50% were aware of donning and doffing of PPE practices. About 84.60% knew the

complete procedure of donning and doffing of PPE. 90.80% knows all the components of PPE kits. The study subjects who had knowledge on sensitivity and importance of donning and doffing were about 96.20%. Almost 99.20% knew that virus dispersion occurs more commonly during doffing represented in Figure 2.

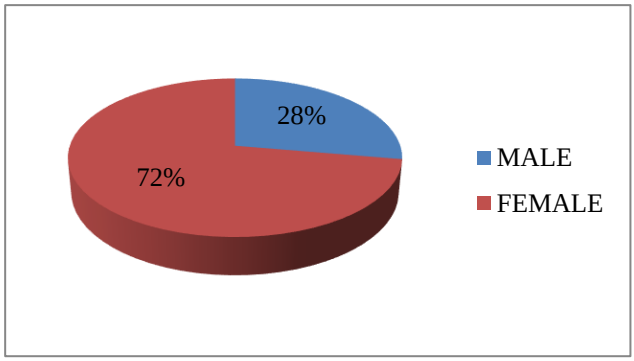

Figure 1: Distribution of study subjects according to gender.

Attitude about donning and doffing of PPE was assessed in which all of them had positive attitude that donning and doffing of PPE is a critical process. Only 36.90% had agreed that facilities were adequately equipped. Only 35.40% had agreed that donning and doffing practices were more hyped. About 79.20% agreed that if coworker doesn't follow the procedure properly it will affect them represented in Figure 3.

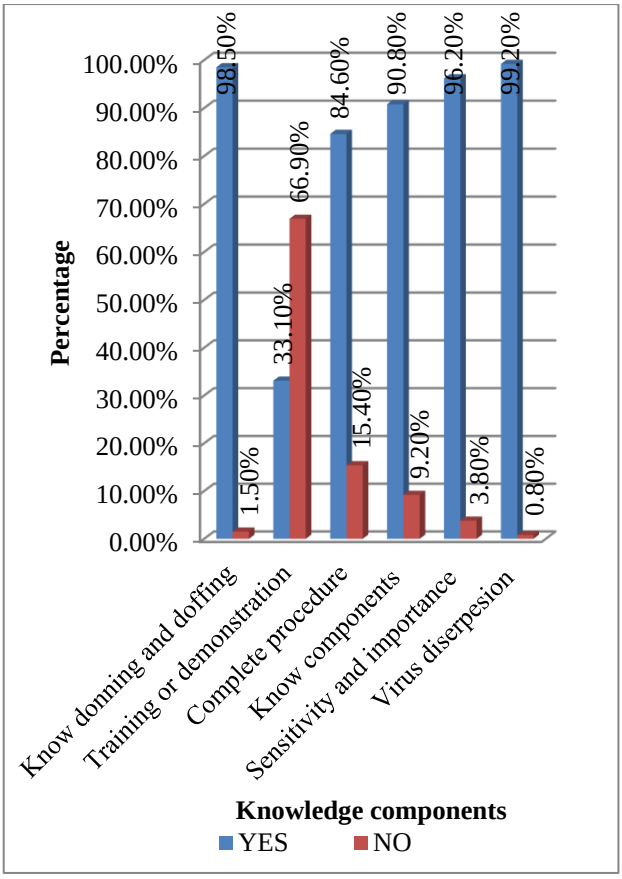

Figure 2: Knowledge on donning and doffing of PPE

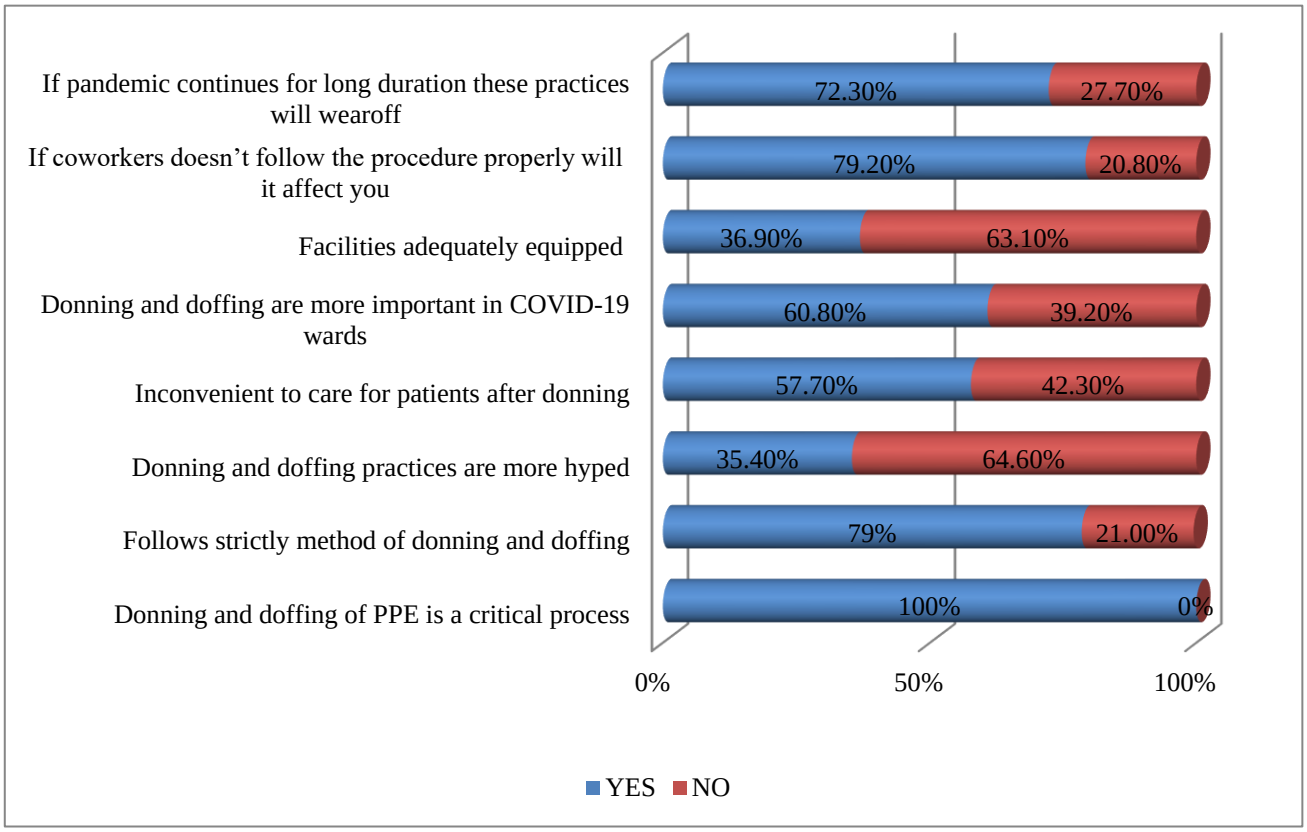

Figure 3: Attitude on donning and doffing of PPE.

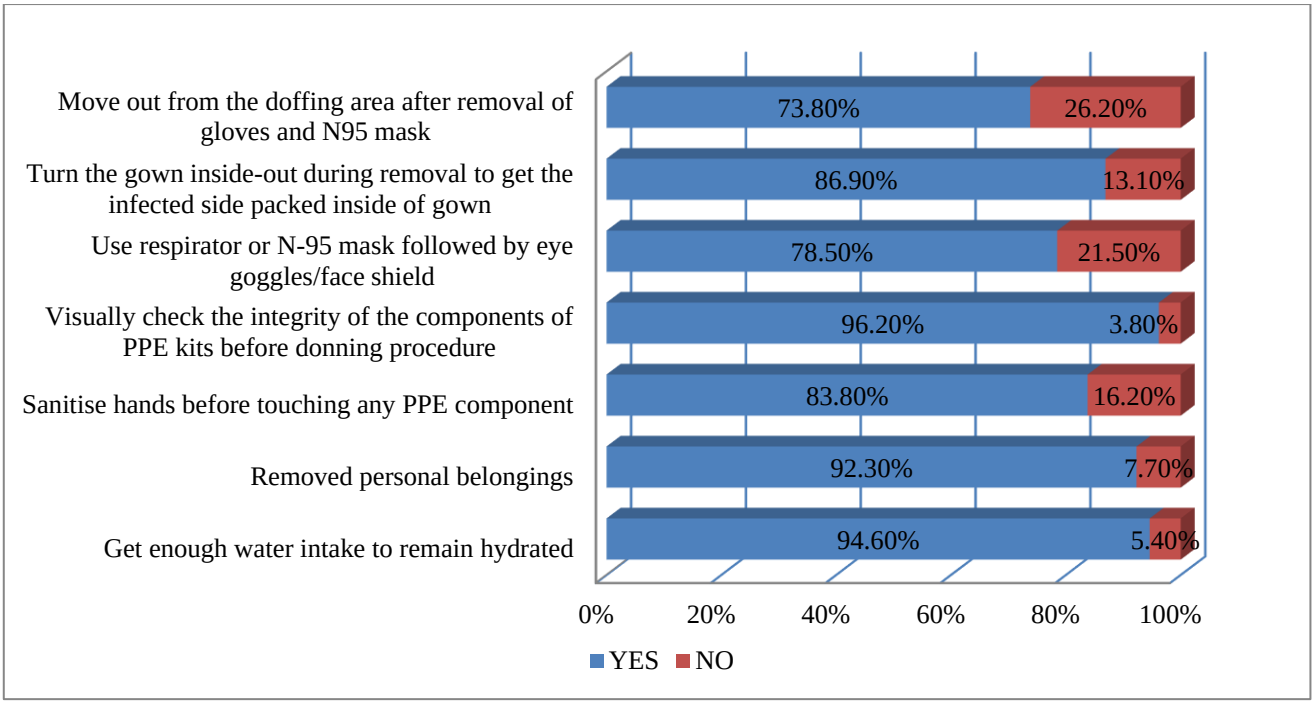

Figure 4: Practice on donning and doffing of PPE.

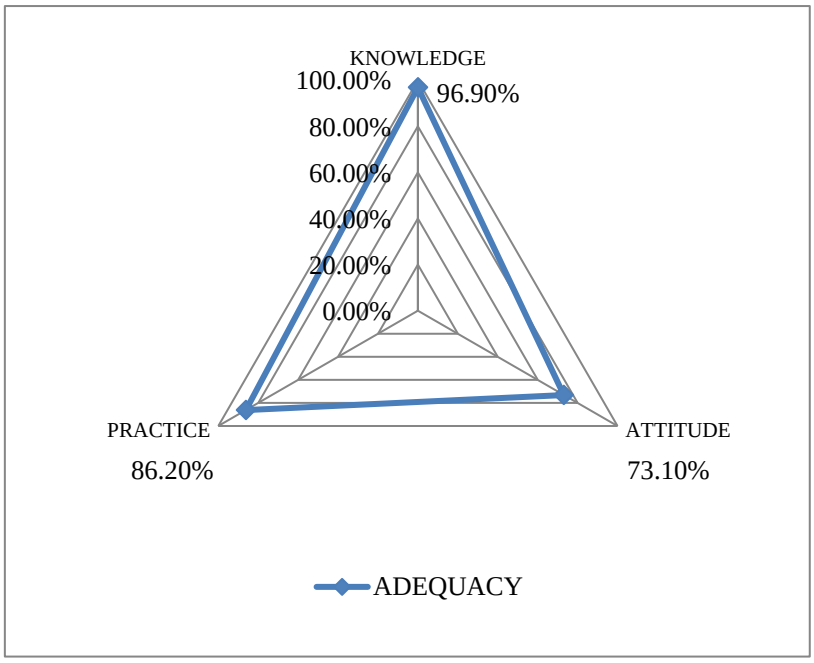

Figure 5: Proportions of KAP adequacy on donning and doffing of PPE.

Table 1: The mean scores of KAP with respect to training of PPE.

Variables	Training	N	Mean	SD	Std. error mean	P value
Knowledge score	Yes	43	5.95	0.213	0.032	0.000
	No	87	4.59	0.582	0.062	
Attitude score	Yes	43	4.91	1.394	0.213	0.039
	No	87	5.36	1.023	0.110	
Practice score	Yes	43	12.37	1.964	0.300	0.000
	No	87	10.98	1.718	0.184	

Practices about donning and doffing of PPE were assessed in which most of them i.e., 94.60% had practice of taking enough water to remain hydrated. About 92.30% removed personal belongings before donning PPE kits. The study subjects who visually checked the integrity of the components of PPE kits before donning procedure were about 96.20%. Nearly three-fourth of them i.e., 78.50% used respiratory or N-95 mask followed by eye goggles/face shield. Correct removal of gown inside-out during removal of PPE kit was practiced by 86.90% of the study subjects. About 83.80% of them sanitized hands before touching any component of PPE.73.80% moved out from the doffing area after removal of gloves and N95 mask represented in Figure 4.

While coming to overall KAP of donning and doffing of PPE, 96.90% had adequate level of knowledge, 73.10% had positive attitude and 86.20% followed good practices of donning and doffing of PPE represented in the Figure 5.

In the present study, we found that there was statistically significant mean difference between the KAP scores with respect to training of PPE. So, this infers that training plays important role in control of spread of COVID-19 infection which was represented in Table 1.

DISCUSSION

Most of the studies on PPE have been conducted during or after the Ebola outbreak. There is a dearth in studies on use of PPE during COVID-19 outbreak, especially on donning and doffing of PPE as per guidelines among health care workers.

In the present study adequate level of knowledge was found to be 96.90% of study subjects, positive attitude was seen among 73.10% of study subjects and good practices were seen among 86.20% of study subjects.

In the study done by Abukhelaif et al in Saudi Arabia, about 86% of the HCWs have adequate level of knowledge which was found to be fairly similar to our study.[12]

In the study done by Mishra et al in Kolkata, West Bengal, the study subjects having adequate level of knowledge was found to be 84.9% and the study subjects having positive attitudes was found to be 62.3% which was found to be fairly similar to our study.[13]

In the study conducted by Hossain et al in Bangladesh, about 99.5% had adequate level of knowledge, 88.8% had positive attitude which was found to be fairly similar to our study.[14]

In the study done by Pandey et al in Nepal, about 79.5% had adequate level of knowledge and 75.6% and good practice.[15] These results were contrast to our study in which this difference might be due to difference in study participants where medical officer, resident doctor, and consultant doctor or nurses which included staff nurses, bachelor of science (BSc) in nursing or bachelor in nursing (BN) staffs or master of science (MSc) in nursing or master in nursing (MN) staffs were involved in study conducted by Pandey et al but in our study only interns were involved.[15]

In the study conducted by Kumar et al in Bihar, about 99.30% had adequate level of knowledge, 98.9% had positive attitude and 90.5% had good practice which was found to be fairly similar to our study.[16]

In the present study the study subjects who had undergone training on PPE were about 66.90%.

In the study conducted by Garg et al 58% of the study subjects had underwent training on PPE.[17] In the study conducted by Mishra et al 58.5% of the study subjects had underwent training on PPE.[13] In the study conducted by Pandey et al about 58 % of the study subjects had underwent training on PPE.[15] In the study conducted by Piché-Renaud et al 78 % of the study subjects had underwent training on PPE.[18] In the study conducted by Prakash et al 67.8 % of the study subjects had underwent training on PPE.[19] In the study conducted by Indu et al 73.5 % of the study subjects had underwent training on PPE, the findings of all the above studies were found to be fairly similar to our study.[20]

Limitations

Less sample size and confined to single institute due to COVID-19 pandemic restrictions.

CONCLUSION

Overall, there was adequate level of KAP and we found a significant mean difference between the trained and untrained study subjects with respect to KAP. This could be addressed by training, inculcating habits of good medical practices that may require designing in-house training programs, and using digital techniques and technology to keep better monitoring during critical procedures and keep guiding the users, which will lead to reduced incidence of contamination during pandemic times like COVID-19.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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