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Assessing Knowledge, Attitude And Practice Regarding Personal Protective Equipment Among First Aid Centers And Clinics Of Peshawar City

Abdur Rahman
Faculty of Allied Health Sciences, Superior University, Lahore

Tehmina Tariq
Lecturer, Faculty of Allied Health Sciences, Superior University, Lahore

Naveed Ullah Khan
Lecturer, Emergency Care Technology, Kohat University of Science and Technology, Kohat, KPK

Arbab Haroon
Department of Emergency care Technology, Lawaghar Institute of Medical Sciences, Karak Affiliated with Khyber Medical University Peshawar

Author Details

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Corresponding E-mail & Author*:
Abdur Rahman
Faculty of Allied Health Sciences, Superior University, Lahore

Abstract

Background: Personal Protective Equipment (PPE) is a cornerstone in the prevention of healthcare-associated infections and occupational hazards for HCWs. This research was conducted to determine the knowledge, attitude, and practice (KAP) of HCWs in relation to PPE use and also find out factors that potentially impact adherence to IPC protocols.

Method: A cross sectional study was undertaken involving 92 health care workers which included doctors, nurses, paramedical staff and technicians. The approach used to collect the data was structured, self-administering questionnaire based on knowledge, attitude and practice of PPE use. The relationships and predictors of PPE compliance were evaluated using descriptive statistics, Pearson's correlation, one-way ANOVA, multiple linear regression.

Results: The results revealed that the majority of respondents had adequate knowledge (Mean = 0.97 ± 0.17), positive attitudes about PPE use (Mean = 4.72 ± 0.48) and good practice, except for minor shortcomings related to donning and doffing procedures. Eighty-point four percent participants were formally trained in IPC. The correlation analysis demonstrated that there were positive correlations between knowledge, attitude and practice ($r = 0.42–0.61$, $p < 0.01$). Knowledge ($p = 0.005$) and practice ($p = 0.001$) differed significantly between the categories in one-way ANOVA, doctors were more knowledgeable while nurses' practices were better. Knowledge ($\beta = 0.46$, $p < 0.001$), attitude ($\beta = 0.29$, $p = 0.002$) and IPC training ($\beta = 0.21$, $p = 0.006$) were predictors of PPE practice in the regression while no significant effect was found for age and profession on PPE practice by regression coefficients analysis.

Conclusion: Overall, healthcare workers exhibited good knowledge, positive attitudes, and satisfactory PPE practices. However, observed gaps highlight the need for regular refresher training, improved supervision, and consistent PPE supply. Enhancing knowledge, fostering positive attitudes, and strengthening IPC training programs are essential strategies to improve compliance and reduce infection risks among healthcare professionals.

Introduction

Personal Protective Equipment (PPE) plays a critical role in safeguarding healthcare workers (HCWs) from occupational hazards, including infectious diseases, chemical exposures, and physical risks. In settings such as first aid centers and clinics, where direct patient interaction is frequent, PPE serves as an essential barrier against pathogens like viruses, bacteria, and other contaminants. Effective use of PPE, encompassing items such as masks, gloves, gowns, and respirators, not only protects HCWs but also prevents the transmission of infections to patients and the broader community. However, the efficacy of PPE hinges on proper donning, doffing, and adherence to protocols, as improper handling can lead to self-contamination and increased risk of harm (1,2).

Despite its importance, gaps in knowledge, attitude, and practice (KAP) among HCWs regarding PPE remain a significant concern, particularly in resource-limited environments. Studies have shown that even trained professionals may exhibit poor compliance, with self-contamination rates during PPE removal ranging from 46% to 90%. This underscores the need for comprehensive training and awareness programs to ensure that PPE is used rationally and effectively. In the context of global health challenges, such as pandemics involving infectious agents like Ebola or COVID-19, the demand for PPE has surged, highlighting the urgency of addressing KAP deficiencies to mitigate risks and optimize resource allocation (3,4).

The primary aim of this article is to assess the KAP of HCWs towards PPE in first aid centers and clinics, with objectives to improve compliance, inform evidence-based initiatives, and enhance safety protocols. By examining existing literature and empirical data, this work seeks to bridge knowledge gaps, particularly in low-resource settings, and promote better practices that integrate PPE as a supplement to other infection control measures, such as administrative controls and engineering solutions. Ultimately, fostering positive attitudes and practical skills among HCWs can lead to safer healthcare environments and reduced healthcare-associated infections (5,6).

A cross-sectional study by Rehman et al. (2019) conducted at a tertiary healthcare center evaluated KAP among junior and senior resident physicians, nursing staff, and other HCWs using an online, pre-validated questionnaire. Among 423 participants out of 475 eligible, the overall accurate response rate was 75.8%, with significant variations in knowledge scores based on designation ($F=6.602$, $p<0.01$), indicating that higher-level HCWs demonstrated greater proficiency. This study highlights the influence of professional hierarchy on PPE knowledge and underscores the need for targeted training to address disparities, especially in high-risk scenarios like Ebola virus disease (EVD) treatment, where improper doffing can lead to self-contamination in up to 90% of cases (7,8).

Further research by Mohammad Ali Hossain et al. (2020) contrasted with findings from Luwik et al., revealing that while HCWs possessed good general knowledge of PPE, their practice was often inadequate or half-hearted. The study emphasized factors influencing KAP, such as the need for counseling, education, and public awareness campaigns to improve compliance. Similarly, Wenwen Wu et al. (2021) concluded that hospital management should leverage controllable elements, like tailored training programs, to enhance HCWs' awareness of HAIs and promote

healthy behaviors, adapting measures to individual and cultural factors for better outcomes in PPE usage (9,10).

Beyond immediate infection prevention, improving KAP towards PPE in first aid centers and clinics yields broader benefits, including enhanced operational efficiency and cost savings. For instance, proper PPE practices reduce the incidence of HAIs, thereby decreasing hospital readmissions, treatment delays, and associated healthcare costs. Additionally, fostering positive attitudes among HCWs can boost morale and job satisfaction, leading to better patient care and lower staff turnover rates. In emergency settings, where timely interventions are critical, streamlined PPE protocols can minimize delays in care, as evidenced by studies showing that cumbersome donning processes otherwise hinder response times. Moreover, evidence-based PPE initiatives can inform policy development, ensuring equitable access to training and resources in underserved areas, ultimately contributing to global health security and resilience against future outbreaks (11).

In conclusion, the effective use of PPE is indispensable for protecting HCWs in first aid centers and clinics, yet persistent gaps in knowledge, attitude, and practice pose ongoing risks. By synthesizing insights from key studies and emphasizing the integration of PPE with other control measures, this article advocates for targeted interventions to enhance compliance and safety. Addressing these deficiencies through education, training, and resource allocation not only mitigates infection risks but also promotes sustainable healthcare practices. Future research should focus on longitudinal evaluations in diverse settings to refine protocols, ensuring that HCWs are empowered to deliver safe, high-quality care amid evolving health threats (12).

METHODOLOGY

This study employed a cross-sectional research design to assess the knowledge, attitude, and practice (KAP) of healthcare workers (HCWs) regarding personal protective equipment (PPE) in first aid centers in Peshawar City. The sample size was calculated using the formula $ n = \frac {d^2 Z^2 \cdot P \cdot (1 - P)} {} $, where Z = 1.96 for a 95% confidence level, P = 0.5 (assuming maximum variability due to lack of prior data), and d = 0.05 (margin of error), resulting in a required sample of 92 respondents. Convenient sampling was utilized to recruit participants from Category A healthcare facilities, including all first aid centers in Peshawar, while excluding Category B, C, and D hospitals. Data collection spanned four months and involved a structured questionnaire administered to eligible HCWs. Analysis was conducted using IBM SPSS Statistics Version 29, with descriptive statistics (frequencies, percentages, means, standard deviations, and medians) employed to summarize variables, and inferential statistics (regression analysis and ANOVA) applied to examine relationships between independent and dependent variables.

RESULTS

The table offers background information on those participants and their education. A large majority (41.3%) of people holding a Bachelor's degree shows most respondents they got their undergraduate education in that way. A lot of these people we found in little less than half of those with diplomas and certificates (34.8%) who have some professional or technical qualifications at least to fall back on later in life. The number of people who have obtained a Master's degree from institutions is limited (18.5%), with only a few going on to study further after completing schools or universities Only a small fraction of the sample, a mere 4.3%, had a PhD or other graduate degree. It is clear that individuals with doctoral-level education are underrepresented. Not only that, but 1.1% of our participants fell into this category too. Possibly this other group refers to people in occupational or other types of non-formal training. The

certain thing is the data as a whole show that the vast majority of participants had already completed their education at either an ordinary university or vocational school.

Table no 1: Distribution of Participants by Education Level

Education Level	n (%)
Bachelor's degree	38 (41.3)
Diploma	32 (34.8)
Master's degree	17 (18.5)
PhD or equivalent	4 (4.3)
Other	1 (1.1)

The gender distribution of the participants is shown in Table. The samples were more male (68.5% of participants) than other samples. On the other hand, the proportion of female participants was 35.5%, showing a relatively low proportion of women participation. Such distribution indicates a predominantly male-based study population (such could be due to gender characteristics or difference in access and participation within the area of the study).

Table 2: Distribution of Participants by Gender

Gender	n (%)
Male	63 (68.5%)
Female	29 (35.5%)

Table presents the professional experience of the respondents. Doctors accounted for the largest group (32.6%), which means about a third of respondents were doctors. The second most common occupational category was nurses (26.1%), which accounted for a large proportion of the healthcare workforce in the sample. Paramedics (20.7%) and Techs (12.0%) formed smaller yet significant proportions of the sample, adding to the range of roles that were sampled in this research. Another 8.7% of the respondents belonged to the other category, possibly depicting administrative/support staff. In general, the results showed that most respondents were health professionals who take care of patients, such as physicians and nurses.

Table 3: Distribution of Participants by Profession

Profession	n (%)
Doctor	30 (32.6%)
Nurse	24 (26.1%)
Paramedic	19 (20.7%)
Technician	11 (12.0%)
Other	8 (8.7%)

The Table shows distribution of the participants in terms of their service years. Many participants were relatively early in their post-graduate careers (34.8% had 1–5 years of experience, which was the largest group). This was then followed by the 6-10 years presented 27.2% of which are midcareer with a fairly moderate experience. A minority of participants (21.7%) were experienced and reflected the group with a long background to their work (>10 years). Conversely, 16.3% had no experience for at least one-year post-graduation informing about presence of newly appointed and

recently graduated staff. In summary, the data indicate that most participants were early- or mid-career professionals with 1-10 years of professional experience.

Table 4: Distribution of Participants by Work Experience

Experience	**n (%)**
< 1 year	15 (16.3%)
1–5 years	32 (34.8%)
6–10 years	25 (27.2%)
> 10 years	20 (21.7%)

This table shows how participants vary in their formal Infection Prevention and Control (IPC) training. According to portable or 10.74 participants (08.4%) assigned to spoken formal IPC courses all the way up indicate that professional ability and awareness of how to control infection are at high level in this group by itself. However, 18 participants (19.6%) reported that they only received on the job training in infection control. The data, in general, suggests that the majority of participants had sufficient IPC training. This contributes to better compliance with infection prevention standards in healthcare settings.

Table 5: Distribution of Participants by Formal Infection Prevention and Control (IPC) Training

Formal IPC training	**n (%)**
Yes	74 (80.4%)
No	18 (19.6%)

The table gives the results of the level of participation in the knowledge and understanding of various aspects of personal protective equipment (PPE) use and management The findings illustrate that almost all participants knew correctly objects which do not fall into the category of PPE (Mean = 0.97, SD = 0.17), mt7>which represents a very high level of understanding. The same breeding-ground arrangements was Over 90 percent awoke the participants also showed high recognizing ability of the recommended frequency for changing gloves (Mean = 0.95, SD = 0.22), indicating that they are in compliance with the guidelines of nosocomial infections. On the other hand, knowledge about how to dispose PPE in biohazard bins (Mean = 0.86, SD = 0.35) was evidently lower, indicating many faults in practice. Overall, the results show that participants possessed a good grounding in PPE knowledge with some minor points of strength unavailable the details; disposal in particular requires further study.

Table 6: Descriptive Statistics of Knowledge Variables

Variable	**Mean**	**Std. Deviation**	**Interpretation**

Which of the following is NOT considered PPE?	0.97	0.17	Nearly all respondents correctly identified non-PPE items, showing strong conceptual clarity.
Correct sequence for donning PPE	0.91	0.28	Most participants understand proper donning order; minor inconsistency in practice.
Recommended frequency for changing gloves	0.95	0.22	High awareness of infection-control protocols related to glove use.
Proper disposal method (Biohazard bin)	0.86	0.35	Good knowledge of biohazard waste disposal; a few still mis-dispose PPE.

In this table participants' perceptions and attitudes toward the importance of using PPE (personal protective equipment) are summarized. The findings show that most respondents also felt confident their ability to put on and take off PPE (Mean = 4.45, SD = 0.66), however some respondents suggested they might need more practical experience. Overall, participants appear to have a relatively low degree of conformity with the idea that PPE is Unnecessary trouble (Mean = 4.31, SD=0.71). This indicates a strong emphasis on workers ' security and general acceptance of PPE rather than some sort of inconvenience. And indeed, as the graph below shows, they were most supportive of sticking to PPE adherence. Based on their satisfaction survey responses, workers were generally quite content with occupational health and safety training on PPE (Mean = 4.3, SD = 0.72). Some, however, were careful to point out that there needs to be an ongoing set of experienced wages and benefits provided for staff who work in this extremely hazardous environment. Another important category of resources where participant rating was highly positive is seen by the fact that the availability (Mean = 4.37, SD = 0.68) PPE, though there were a few minor cracks in supply reliability. As a whole, the data reflect an overwhelmingly positive feeling about using PPE, supported by work responsibilities as well as self-reliant access to protective resources.

Table 7: Descriptive Statistics of Attitude Variables

Variable	**Mean**	**Std. Deviation**	**Interpretation**
PPE is essential for HCW safety	4.72	0.48	Respondents strongly believe PPE is vital for self-protection.
PPE reduces infection transmission	4.8	0.4	Very positive belief in preventive role of PPE.
Confidence in donning/doffing	4.45	0.66	Majority feel competent handling PPE; few needs more practical support.
PPE is an unnecessary burden (reversed)	4.31	0.71	Low agreement with negative views confirms positive safety culture.
Recommend consistent PPE use to colleagues	4.62	0.5	Peer reinforcement and advocacy for PPE use are common.
Workplace provides adequate PPE training	4.3	0.72	Overall satisfaction with training, but needs regular refreshers.

Workplace adequately supplies PPE	4.37	0.68	Positive perception of availability with minor supply concerns.

Compliance with the recommended sequence for using and taking off PPE was only fair (Mean=0.73, SD=0.44), implying while most people followed correct procedures, it might be worth repeatedly explaining through training. On the other hand, the participants showed greater than eight out of ten changes in gloves after each patient or procedure (Mean = 0.81, SD = 0.39), reflective of strong infection control practice. In the same way, most generally do pre-use inspection of PPE (Mean = 0.79, SD = 0.41). However, a few people have skipped this step, probably because they were up against their workloads. The participants' adherence to the proper disposal of PPE according to biohazardous waste management policies was also praiseworthy (Mean = 0.84, SD = 0.37), indicating good environmental consciousness. Conversely, adherence to non-reuse of disposable PPE was somewhat lower (Mean = 0.72, SD = 0.45). A small number of participants admitted reuse at times during shortages, indicating that more stringent supervision and enforcement of safety regulations are necessary. The lowest mean score was for taking regular refresher training (Mean = 0.41, SD = 0.49), meaning there isn't much chance to refresh oneself professionally. Overall, the results indicate that participants ' PPE methods are generally in keeping with the guidelines, but they also serve to emphasize necessity of continued learning and greater attention to enforcement after safety standard has been established.

Table 8: Descriptive Statistics of Attitude Variables

The table shows the Pearson correlation coefficients on how knowledge, attitude and

Variable	Mean	Std. Deviation	Interpretation
Frequency of PPE use during patient care	3.62	0.72	Most wear PPE routinely; some still skip in low-risk cases.
Following recommended donning/doffing sequence	0.73	0.44	Two-thirds adhere to sequence; need reinforcement training.
Glove change after each patient/procedure	0.81	0.39	High compliance with glove protocols.
Regular inspection of PPE before use	0.79	0.41	Majority inspect equipment; some skip due to time pressure.
Proper disposal according to guidelines	0.84	0.37	Strong waste-management compliance.
Avoid reuse of single-use PPE	0.72	0.45	Re-use occurs during shortages; policy reinforcement needed.
Receiving refresher training (annual/quarterly)	0.41	0.49	Limited ongoing training; scheduled refreshers should be institutionalized.

practice of Personal Protective Equipment (PPE) are related. In this table, values for r and p are provided separately. The result indicates there exists a moderate positive correlation between knowledge and attitude ($r=0.42$, $p<0.01$), which means that as individuals' level of knowledge rises their positive attitude toward using PPE will grow likewise. Knowledge and practice register a significant positive correlation ($r=0.61$, $p<0.01$), which means that those participants who possess a better understanding about PPE procedure are also more likely to execute it correctly in practice. Also, the correlation between attitude and practice ($r=0.55$, $p <0.01$) shows that a favorable view of PPEs promotes consistent, appropriate uses. The results of this study hold it likely that high levels of knowledge or a positive attitude to PPE will

significantly affect the effective implementation of PPE practices by healthcare workers.

Table 9: Descriptive Statistics of Attitude Variable

Correlation Matrix (Pearson r, n = 92)			
Variable	**Knowledge**	**Attitude**	**Practice**
Knowledge	1	0.42 **	0.61 **
Attitude	0.42 **	1	0.55 **
Practice	0.61 **	0.55 **	1

The results of One-Way ANOVA including the knowledge, attitude and practice towards using PPE among different professional groups are presented in table to this end. The knowledge scale differed significantly by profession ($F(3, 88) = 4.62$, $p = 0.005$, $\eta^2 = 0.14$); physicians had higher levels of knowledge than nurses/paramedics did as observed in post - hoc comparisons and between–group contrasts. Attitude scores, on the other hand, did not differ significantly between professions ($F(3, 88) = 2.11$, $p = 0.104$ $\eta^2 = 0.07$), with a weak but positive trend among formally IPC-trained participants suggesting a generally favorable attitude to PPE in all professional groups. It was observed that there was significant variability in practice scores ($F(3, 88) = 6.37$, $p= 0.001$, $\eta^2= 0.18$), and the nurses have reported a better compliance to this intervention as compared to other HCWs. In general, the results indicate that professional categorization is an important factor for knowledge and practice of PPE standards, but they all have positive attitudes toward PPE across the healthcare groups.

Table 10: One-Way ANOVA Results Comparing Knowledge, Attitude, and Practice Scores Across Professions

One-Way ANOVA (Comparison Across Profession)					
Dependent Variable	**df (between, within)**	**Frequency**	**P Value**	**η^2**	**Interpretation**
Knowledge Score	3, 88	4.62	0.005	0.14	Significant — Doctors > Nurses > Paramedics
Attitude Score	3, 88	2.11	0.104	0.07	NS trend toward positive attitude in trained staff
Practice Score	3, 88	6.37	0.001	0.18	Significant — Nurses highest compliance

Table presents the results of a multiple linear regression on predictors of Personal Protective Equipment (PPE) practice among participants. An overall model was statistically significant, $F(5, 86) = 21.07$, $p <0.001$ indicating that the chosen factors collectively explain a great proportion of the variation in PPE practice. Looked at the knowledge score, it significantly influenced PPE practice ($B = 0.58$, $\beta = 0.46$, $t = 5.27$, $p <.001$), where participants with more knowledge were practicing what was recommended for PPE practices positively. Positive attitude score was found to be a positive predictor ($B = 0.32$, $\beta = 0.29$, $t = 3.21$, $p = 0.002$) and indicated that those with more favorable attitudes toward PPE showed better compliance. Moreover, the

official IPC training was an actual influencer for practice (B = 1.76, β = 0.21, t = 2.84, p = 0.006), underlining the significance of continuous professional education toward enhancing infection control practices. Conversely, occupation group (using doctors as a reference category) demonstrated a non-significant negative association with practice (B = -0.9, p = 0.077), such that technicians had lower scores on practice, although not significantly so. Age was not significantly associated either (B = -0.1, p = 0.271), which means that irrespective of the age PPE adherence was same. In summary, these findings have highlighted that knowledge, attitude and formal IPC training are significant predictors of good PPE practice although profession and age make limited contribution to variance in practice behavior.

Table 11: Multiple Linear Regression Analysis Predicting PPE Practice Scores

ANOVA (Model Fit): F (5, 86) = 21.07, p < 0.001 → Model significant.						
Predictor	**B**	**β**	**t**	**p**	**95% CI (B)**	**Interpretation**
Knowledge Score	0.58	0.46	5.27	< 0.001	(0.36, 0.80)	Higher knowledge → better practice
Attitude Score	0.32	0.29	3.21	0.002	(0.12, 0.52)	Positive attitude → compliance
IPC Training (Yes=1)	1.76	0.21	2.84	0.006	(0.52, 3.00)	Training significantly improves practice
Profession (Ref = Doctor)	-0.9	-0.1	-1.8	0.077	(-1.98, 0.10)	Technicians lag slightly
Age	-0.1	-0.1	-1.1	0.271	(-0.14, 0.04)	No age effect

DISCUSSION

This study examined the awareness, attitude and practice (KAP) of healthcare workers (HCWs) towards Personal Protective Equipment (PPE), and determined factors that influence its use. The findings revealed that respondents had acceptable KAP on average, but also some differences among the professional groups which were influenced by their training history as well as behavioral responses. These findings are in keeping with international studies suggesting that ongoing education, formal IPC training, and organizational support contribute to enhancing PPE compliance for healthcare workers (14).

Among participants, the high average result for knowledge indications most health care workers had a good understanding of the essential principles of PP. Observations of a similar nature were made by Jatin V. Badgujar et al. and Wenwen Wu et al. (15), to the effect that PPE was generally well understood in terms theory by health care professionals working within the third institutional system of health care. Step by step guide: Bizuayehu Atinafu Ataro et al. (16) and Elena Savoia et al. (13) have demonstrated that a large gap still exists between knowledge and correct use, even though the level of awareness among workers is already high.

This is primarily due to the lack of resources, heavy workloads and irregular training sessions. With a ($p<0.01$) and professional categories were compared, it becomes clearer that other similar things also emerged in the present study which coincided with a conclusion of Garg et al. (17) PPE-related knowledge was better if someone had higher education and/or professional status.

By way of attitude, the present findings showed that it's mainly a good story on the use of PPE by healthcare workers--but technical staff generally were less positive than nurses, and formally trained people more so than their colleagues without training.

The trend is consistent with Mohammad Ali Hossain et al. (18), who pointed out that positive attitudes are no guarantee of up to scratch compliance. Similarly, Cudjoe et al. (19) and Sujan C. Reddy et al. (20) raised the point that resistant PPE adherence, despite good opinions about them like annoyance, inconvenient Ness or just unreality from routine matters at hand all negatively impact this practice.

As to the behavior, the highest PPE compliance rate in this study came from nurses, a point consistent with the viewpoint of Brown Louise et al. (21): Implementing infection prevention measures is nurses' unimpeded work. On the other hand, there were small problems in how hand wrapping techniques like doffing and donning really work, as Garg et al. (22) found closely followed.

Correlation analysis showed a strong positive relationship between scores for knowledge, attitude and practice. This suggests more knowledge and better attitudes mean better utilization of PPE. Similar results were reported by Wu et al. (23) and Atinafu et al. (24), who pointed out the strengthening effect of awareness and motivation make those safe practices possible. Multiple regression analysis also showed that knowledge, attitude, and formal IPC training were significant predictors of PPE practice. These findings were reflected by Hossain et al. and Reddy et al. (25), who noted that organized ongoing training now increases compliance and lowers unsafe practices elsewhere among workers, including health-care workers.

Interestingly, in the current study age did not have a significant effect on PPE practice, contrary to findings from the Wuhan, China KAP survey (26), where older-more experienced nurses were shown to be more likely follow through with more compliant behaviors. Different levels of institutional support or training exposure could be the cause for this difference. While profession also had no significant effect in regression analysis, studies such as Atinafu et al. (27) and McLean suggest that workload, job type and organization culture can all affect PPE compliance--especially among nonmedical and technical staff.

In general, the results confirm what Elena Savoia et al. (28) and Brown Louise et al. if you just give somebody something will they actually use it? It was noted in this study that ongoing education and supervision, as well as institutional commitment are all essential to ensuring long-term compliance with PPEs. This research also supports Garg et al. (29)'s view that refresher courses should be combined with hands-on training to assure correct PPE wear and minimize inciters of contamination. It concludes with an upbeat note: now we know that knowledge, attitude and training on IPC are key to effective PPE use by health care workers.

The fit of these findings with current literature makes clear the need to make infection control education part of standard hospital policy. Ongoing training, checking conditions and ensuring there is equipment available for an emergency can shorten the distance between awareness and constant safe practice that remains to be crossed and recommend for an overall reduction in nosocomial infection, occupational safety thus improved (30).

CONCLUSION

This study evaluated the knowledge, attitude, and practice (KAP) of healthcare workers regarding Personal Protective Equipment (PPE) and explored the factors influencing compliance with infection prevention protocols. The results demonstrated that, overall, healthcare workers possessed satisfactory knowledge, maintained positive attitudes, and exhibited generally good PPE practices. Nonetheless, variations were noted across different professional groups and training levels, emphasizing the need for more focused educational and institutional support strategies. Knowledge was found to be a significant determinant of effective PPE use, as individuals with higher awareness demonstrated better adherence to recommended safety measures.

Likewise, positive attitudes were closely associated with greater compliance, highlighting the importance of motivation and perception in promoting safe practices. Formal Infection Prevention and Control (IPC) training also had a significant positive effect, underscoring the critical role of structured educational initiatives in reinforcing correct PPE application and consistency. Despite these encouraging findings, some deficiencies were observed, particularly in the correct sequence of donning and doffing, occasional reuse of disposable PPE during shortages, and limited access to refresher training programs. These gaps point to the necessity of continuous professional development, periodic skill reinforcement, and stronger institutional commitment to sustaining a culture of infection prevention and control. This study concludes that enhancing PPE compliance among healthcare workers requires an integrated approach that strengthens knowledge, nurtures positive attitudes, and ensures regular IPC training. Incorporating these elements into healthcare policy and daily practice can substantially reduce occupational exposure risks, minimize healthcare-associated infections, and promote a safer clinical environment for both healthcare personnel and patients.

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