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Factors contributing to low uptake of personal protective equipment among health workers at Kayunga regional referral hospital, Kayunga district. A cross-sectional study.

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ABSTRACT

Background

The purpose of the study was to find out the factors contributing to low uptake of personal protective equipment among health workers at Kayunga Regional Referral Hospital, Kayunga District.

Methodology

A cross-sectional study design using a simple random sampling technique. Data was collected from a sample of 50 respondents using a questionnaire written in the English language as a data collection tool; later, data was systematically analyzed manually by use of tally sheets and entered into the Excel computer program Microsoft Excel to generate tables, graphs, and pie charts.

Results

(58%) They were females (42%), and they were males. (46%) were by the Baganda tribe. (48%) took a long time without reading the hospital personal protective equipment policy, (88%) had efficient skills in don and doff, (50%) reported difficulties in breathing as the challenge they face while using PPEs. (70%) reported that they always get access to PPE's, though (38%) reported masks are not usually accessible in their departments, (60%) reported>8 hours as the working duration at the facility, (64%) last had in service training in regards to PPE's during COVID19 pandemic,(72%) reported that the rate of patient turn up in their departments was very high.

Conclusion

Few of the health workers were informed about the hospital policy in regards to PPEs, not entirely all health workers had efficient skills in don and doff, un equitable access to PPEs, long working hours, inadequate access to in service trainings, high patient turn up and low monitoring of the hospital administration programs were the outstanding factors contributing to low uptake of personal protective equipment among health workers.

Recommendation

Kayunga regional referral Hospital administration must set up a committee that will critically monitor health workers from different departments regarding the regular uptake of the PPEs.

Keywords: Uptake of personal protective equipment, Health workers, Kayunga Regional Referral Hospital. Kayunga.

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Background

In Wards at Queen Elizabeth Central Hospital (QECH), Blantyre, Malawi, on availability, accessibility, and proper use of personal protective equipment, most respondents did not use goggles, face masks, sterile gloves, and aprons due to personal negligence behaviors (Davie et al., 2020). Lack of information, inadequate skills, and having a positive attitude towards the use of PPEs influence Nurse compliance in using personal protective equipment. Low compliance with the use of PPEs. Most respondents took long without reading the facility policy regarding using personal protective equipment (Intan et al., 2022). At Gondar University referral hospital, Northwest Ethiopia, the majority, 280 (99.3%), responded that safety precautions such as the use of PPE are important for healthcare facilities since they protect health workers from HAI. 272 (96.5%) believed that healthcare workers are potentially at risk of infection (Deress et al, 2019). Findings from a study that was done by Ahmed et al (2018) revealed that most of the participants (89.6%) stated that they do practice all "universal precautions" while caring for patients and dealing with biomedical waste. Moreover, it was observed that 79.2% of the study population did not complete their vaccination course against Hepatitis B. It

was observed that the number of nurses (90.9%) stated that they did not sustain any needle stick injuries during the past 12 months. Among health workers: A review of associated factors revealed that participants who regularly used hand sanitizer, were trained in COVID-19 prevention techniques, felt hopeless about eventually contracting the disease at work (78%), and felt unsafe at work when following standard precautions (50%) used PPE more effectively (Emmanuel et al., 2023).

METHODOLOGY

Study design

A descriptive cross-sectional study design was used to address the relationship between the study variables. The design is preferred because it was less costly and less time-intensive than other designs

Study setting

Kayunga Hospital is located in Kayunga town, Kayunga district, approximately 67.5 kilometers from Kampala. It was opened in 1973 during the reign of Idi Amin. The facility was reconstructed and upgraded to a regional referral hospital in 2020 with a bed capacity of 300. It offers services to residents of Kayunga district and neighboring districts such as Kamuli, Buikwe, Mukono, Luwero, and Nakasongola. The facility receives an average of 200 patients on a daily basis. Services offered: outpatients, inpatients, maternity services, antenatal services, laboratory services, surgeries, immunization, paediatric nursing, orthopedics, general nursing.

Study population

This was comprised of health workers at Kayunga Regional referral hospital who were present in person and voluntarily ready to provide information during the period of data collection. The target population was preferred as potential participants because they are the providers of health care to patients, and this puts them at risk of infections from patients, sharps equipment, biological wastes, and other equipment.

Study variables

Variables can be termed as any facet of a theory that can change or vary as part of the interaction within the theory.

Dependent variable

Dependent variable was personal protective equipment.

Data collection tools

Since the study was conducted among medical workers who are informed, the researcher used a self-administered questionnaire written in English, observation remarks, face-to-face interviews where necessary, and hospital records.

Independent variables

Individual and health facility-related factors contributing to low uptake of personal protective equipment among health workers were the independent variables.

Selection criteria

Inclusion criteria

Health workers who were present during the period of data collection and ready to consent will be inclusively considered to be part of the study.

Exclusion criteria

The study excluded health workers who were not ready to consent voluntarily to participate in the study during the time of data collection.

Sampling technique

Simple random sampling was used to recruit the respondents into the study. The technique was preferred because it gives a representative sample and produces less or no bias in sampling.

Sampling procedure

Respondents were informed by the researcher about the study, and those who consented were entitled to participate in the study, preferably in their respective departments

Sample size determination

The sample was determined using the following formula;
Kish Leis (1965) $n = z^2pq \quad d^2$
Where; n- Represents sample size.

d- Represents a precision of the study, a precision of 10% will be used due to the limited resources (time and money).

z- Represents standard normal deviation corresponding to 95% confidence interval which is 1.96. p- Represents proportional characteristics where no reasonable estimate is given. Therefore, 84.5% was used.

q- Represents (1-p) which is (1-0.845) $n = 1.96^2x0.845x(1-0.845)$
0.1^2 n = 3.8416x0.130975
0.01 n = 50.32 n ≈ 50 respondents

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Data collection procedure

Ethical considerations were clearly communicated and adhered to before commencement of the data collection process. Before the commencement of data collection, an introductory letter was sent to the medical superintendent of Kayunga regional referral hospital to seek permission. Once permission was granted, the researcher and her assistants introduced themselves to respondents, preferably in their departments, to seek their consent; a list of all the health workers in each department on duty who met the inclusion criteria was randomly sampled to self-administer the questionnaire.

Each respondent was interviewed for periods of about 10-15 minutes or given some extra time depending on the work schedule. The criteria were followed up with each department until the required sample of respondents was attained.

Quality control

In order to ease the data collection process, two research assistants were trained for three days before the actual study and tested on the use of the questionnaire, interpretation, and ability to speak and interpret the questions. The data was checked by the supervisor for its completeness and consistency. Pre-tests were carried out at Wakiso Health Centre IV among 10% of the sample to find out the feasibility of the study tools and the validity of the data to be collected in relation to the objectives. Attention was given according to wording, structure, sequence, and overall presentation of the items in the questionnaires. Since data collection was carried out among health workers on duty, participants receiving the questionnaire were given time to respond, and those who were busy, the researcher collected the survey instruments on the next day.

Data management

Data analysis and presentation

Data was analyzed using frequencies; missing values and invalid entries were counter-checked with the responses on the questionnaires for accuracy, and where necessary, the respondents were contacted for clarification.

Data collection method

Designing the questionnaire is a very important part of the research study. Meaningful responses from the participants can be obtained only if the questionnaire is structured efficiently, taking into consideration important aspects like reliability and validity of the information requested. For this study,

A self-administered questionnaire written in English with both open and closed questions was used as a data collection tool. Kothari (2004) described a questionnaire as a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents. This type of questionnaire was preferred because it is practical, large amounts of information can be collected, and questionnaire data can easily be quantified.

Ethical considerations

Research often involves a great deal of cooperation and coordination among many different people in different disciplines and institutions. Ethical standards promote the values that are the 15 essentials to collaborative work, such as trust, accountability, mutual respect, and fairness. Therefore, before the commencement of the study. Therefore, permission was sought from the Kampala School of Health Sciences research committee, introducing the researcher to the medical superintendent of Kayunga regional referral hospital, seeking permission to carry out the study, with assurance of confidentiality.

Once permission was granted, participants were informed of the purpose of the study and were requested to provide informed consent before the collection of any information. Respondents will be given a clear explanation about the absence of incentives, assurance of confidentiality of their responses, and freedom to quit the study at any point if they wish. The researcher also assured the respondents that there were no risks they would be exposed to throughout their participation in the study.

The data was analyzed manually using tally sheets and numerical data computed using calculators. The Microsoft Word computer program was used to present findings in tables and figures for easy interpretation of study findings

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RESULTS

Demographic data

Table 1: Shows the distribution of respondents according to demographic data (N=50)

Response	Frequency(f)	Percentage (%)
Gender		
Female	29	58
Male	21	42
Total	**50**	**100**
Age		
18-27years	09	18
28-37 years	19	38
38-48 years	20	40
49-58	02	4
Total	**50**	**100**
Tribe		
Muganda	23	46
Musoga	03	6
Mutoro	02	4
Others	22	44
Total	**50**	**100**
Marital status		
Single	17	34
Married	29	58
Divorced	01	2
Widowed	03	6
Total	**50**	**100**
Qualification		
Enrolled nurse	14	28
Registered nurse	07	14
Enrolled Midwife	04	8
Registered midwife	05	10
Doctor	07	14
Laboratory technician	03	6
Others	10	20
Total	**50**	**100**
Working experience at this facility		
Less than one year	02	4
1-2 years	08	16
2-3 years	07	14
5 years and above	33	66
Total	**50**	**100**

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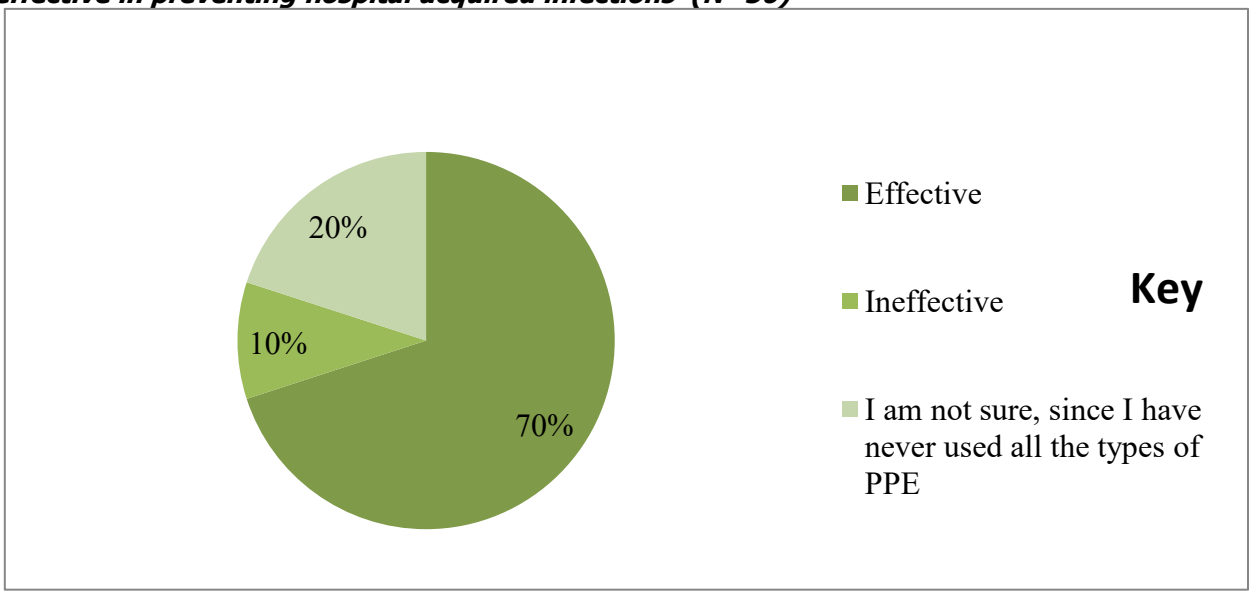
Table 1, more than half of the respondents (58%) were females by sex, whereas the least (42%) were males by sex. Study results that were related to the age of respondents showed that most of the respondents (54%) were within the age group of 38-48 years, whereas the least (4%) were within the age group of 49-58 years. The study further revealed that almost half of the respondents (46%) were Baganda by tribe, whereas the least (4%) were Batoro by tribe. Results from the study indicated that the majority of respondents (58%) were married, whereas the minority (2%) were divorced. Based on the qualifications of the study participants, the study revealed that most respondents (28%) were enrolled nurses, while the least represented were laboratory technicians (6%). The study also revealed that the majority of the respondents (66%) had a working experience of 5 years and above, whereas the least (4%) had a working experience of less than a year.

Individual factors contributing to low uptake of personal protective equipment among health workers

From a narrative perspective, the study revealed that all respondents had ever heard about personal protective equipment.

Figure 1: Shows the distribution of respondents according to whether they considered all PPE effective in preventing hospital acquired infections (N=50)



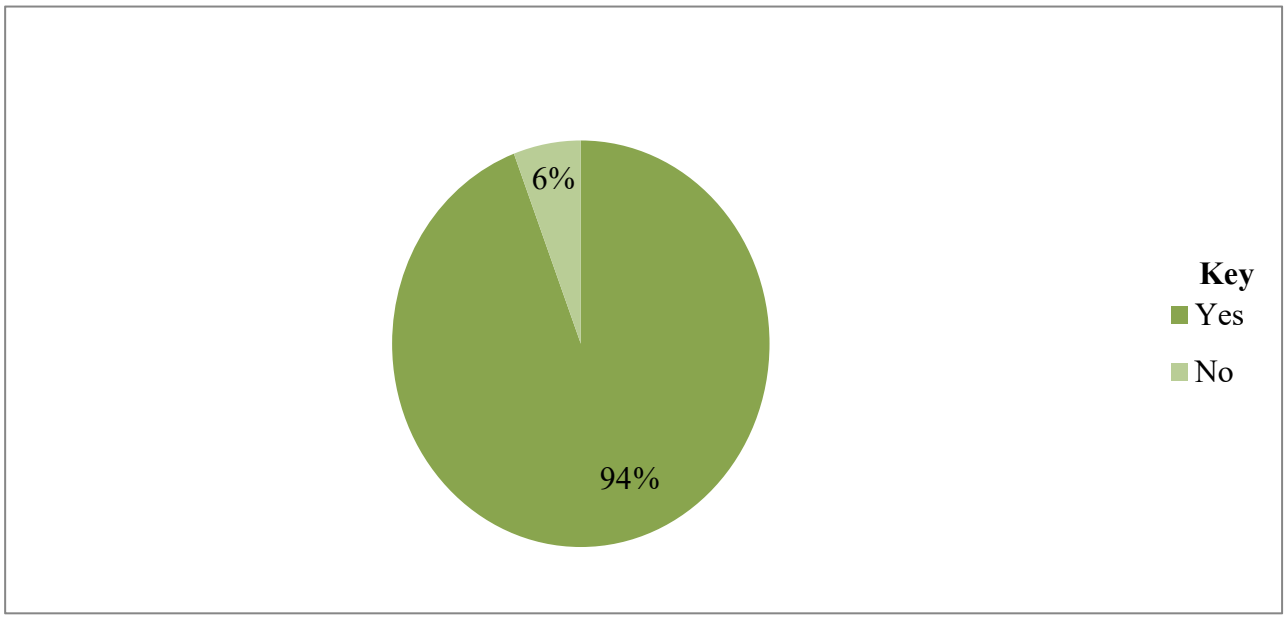
From Figure 1, the majority of the respondents (70%) agreed that PPEs are effective in preventing hospital-acquired infections, whereas the minority (10%) disagreed.

Table 2: Shows the distribution of respondents according to their view about how important are PPE's (N=50)

Response	**Frequency(f)**	**Percentage (%)**
protects health workers from being at risk to pathogens	30	60
PPE's protects patients from being at risk to hospital acquired infections	14	28
Reduces exposure to hospital acquired infections	06	12
Total	**50**	**100**

From Table 2, more than half of the respondents (60%) reported that PPE protects health workers from being at risk of pathogens, whereas the least (12%) noted that it reduces exposure to hospital-acquired infections

Figure 2: Shows the distribution of respondents according to whether they were fully vaccinated for common pathogens(N=50)



From figure 2, almost all respondents (94%) were fully vaccinated for common pathogens, whereas the least (6%) were not.

Table 3: Shows the distribution of respondents according to when they last read hospital personal protective equipment policy (N=39)

Response	**Frequency(f)**	**Percentage (%)**
I have never seen it	10	20
A little bit longer	24	48
Few months back	11	22
I have never read it	05	10
Total	**39**	**100**

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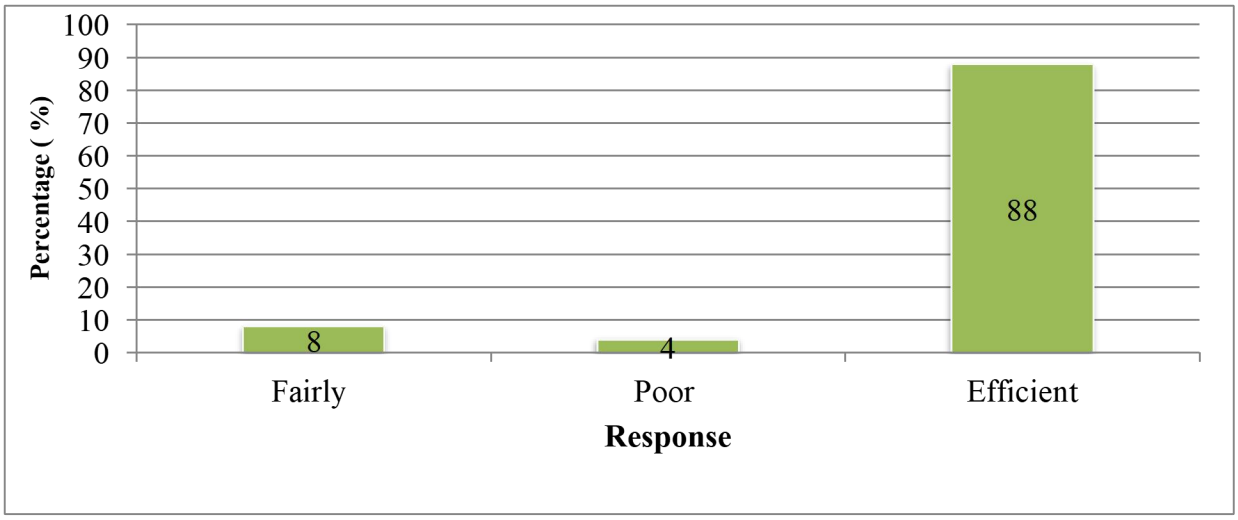
From table 3, most of the respondents (48%) had taken a long time without reading the hospital's personal protective equipment policy, whereas the least (10%) had never read the hospital's personal protective equipment policy.

Figure 3: Shows the distribution of respondents according to their personal skills in regards to don and doff

(N=50)



From Figure 3, the majority of the respondents (88%) had efficient skills in don and doff, whereas the minority (4%) had poor skills.

Table 4: Shows the distribution of respondents according to how they perceived their personal rate of being at risk to nosocomial infections (N=50)

Response	**Frequency(f)**	**Percentage (%)**
Minimal	34	68
High	16	32
Total	**50**	**100**

From Table 4, more than half of the respondents (68%) reported that they had minimal risk of nosocomial infection, whereas the least (32%) reported that they had a high risk of nosocomial infection

Table 5: Shows the distribution of respondents according to the challenges they face while using PPE's (N=50)

Response	**Frequency(f)**	**Percentage (%)**
Difficulties in breathing	25	50
Restricted vision	03	6
Over heat	09	18
Allergic reaction	07	14
Others	06	12
Total	**50**	**100**

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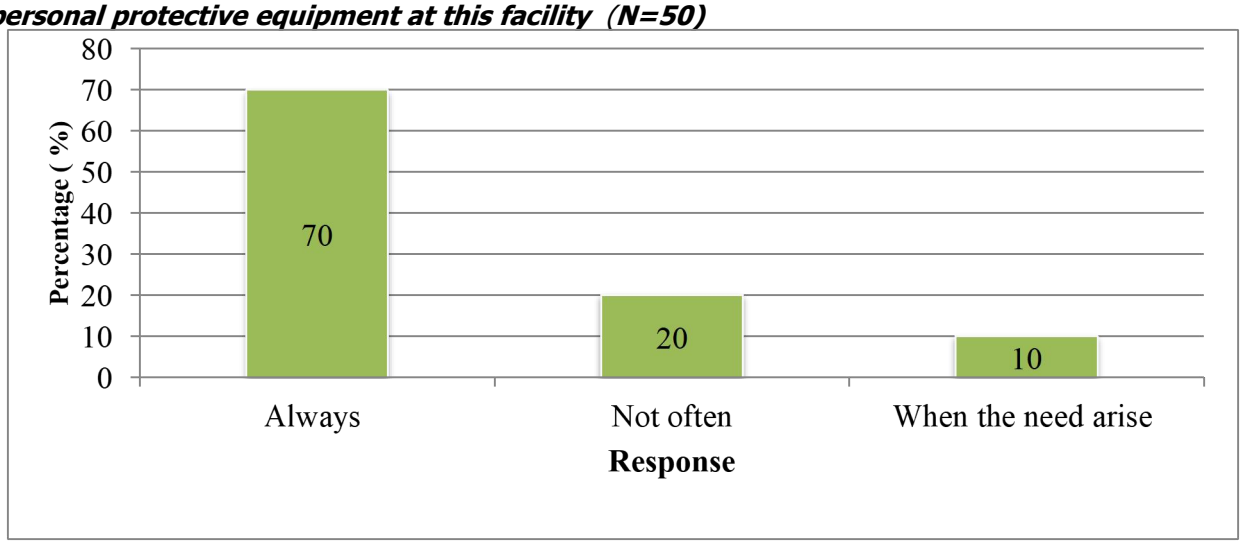
From table 5, half of the respondents (50%) reported difficulties in breathing as the challenge they face while using PPE, whereas the least (6%) reported restricted vision as the challenge they face while using PPE.

Health facility related factors contributing to low uptake of personal protective equipment among health workers

Figure 4: Shows the distribution of respondents according to how often do they get access to personal protective equipment at this facility (N=50)



From figure 4, more than half of respondents (70%) reported that they always get access to PPE, whereas the least (10%) reported that they don't always get access to PPE.

Table 6: Shows the distribution of respondents according to their response about appropriate personal protective equipment which are not usually accessible in their department (N=39)

Response	Frequency(f)	Percentage (%)
Gloves	11	22
Boots	05	10
Face shield	05	10
Masks	19	38
Others	10	20
Total	**39**	**100**

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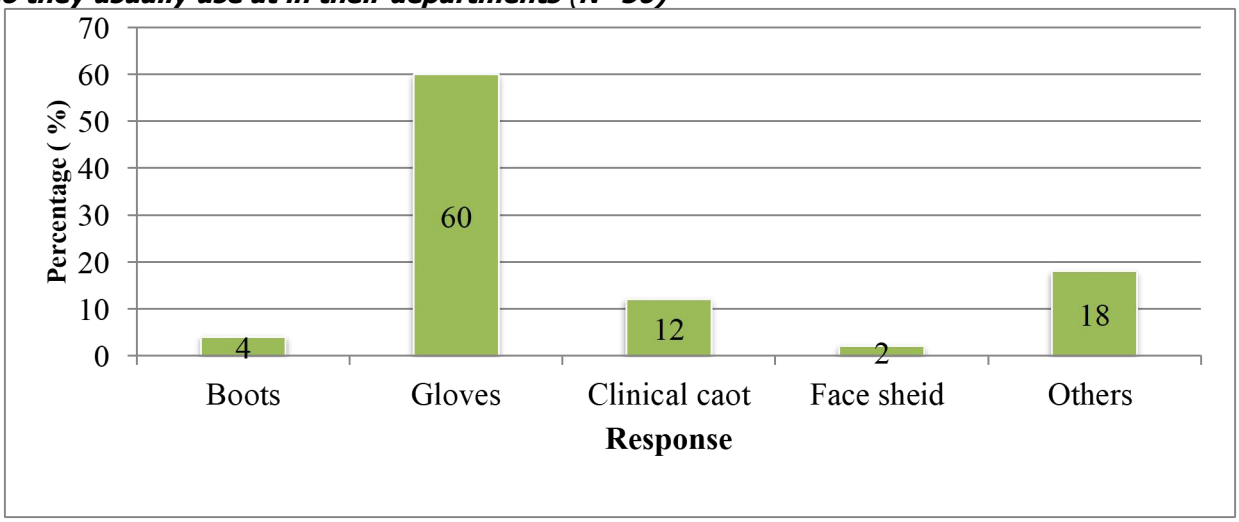
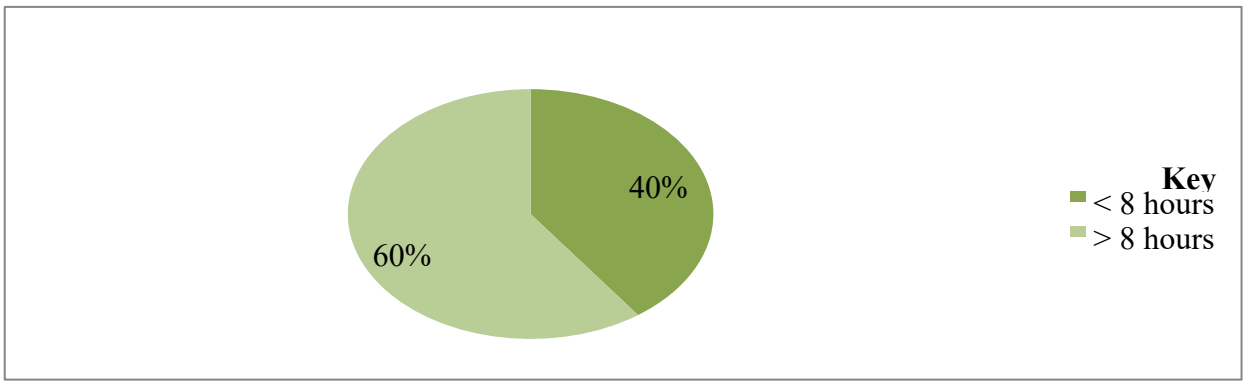
From table 6, most of the respondents (38%) reported masks are not usually accessible in their departments, whereas the least (10%) reported boots and face shield.

Figure 5: Shows the distribution of respondents according to personal protective equipment do they usually use at in their departments (N=50)



From Figure 5, the majority of respondents (60%) reported that they usually use gloves in their departments, whereas the minority (2%) usually use a face shield.

Figure 6: Shows the distribution of respondents according to the working schedule duration at this facility (N=50)



From Figure 6, the majority of the respondents (60%) reported>8 hours as the working duration at the facility, whereas the minority (40%) reported <8 hours as the working duration at the facility.

Table 7: Shows the distribution of respondents according to when they last had in service training in regards to personal protective equipment (N=50)

Response	**Frequency(f)**	**Percentage (%)**
During Covid19 pandemic	32	64
Month's period	10	20
I don't recall	06	12
Never	03	6
Total	**50**	**100**

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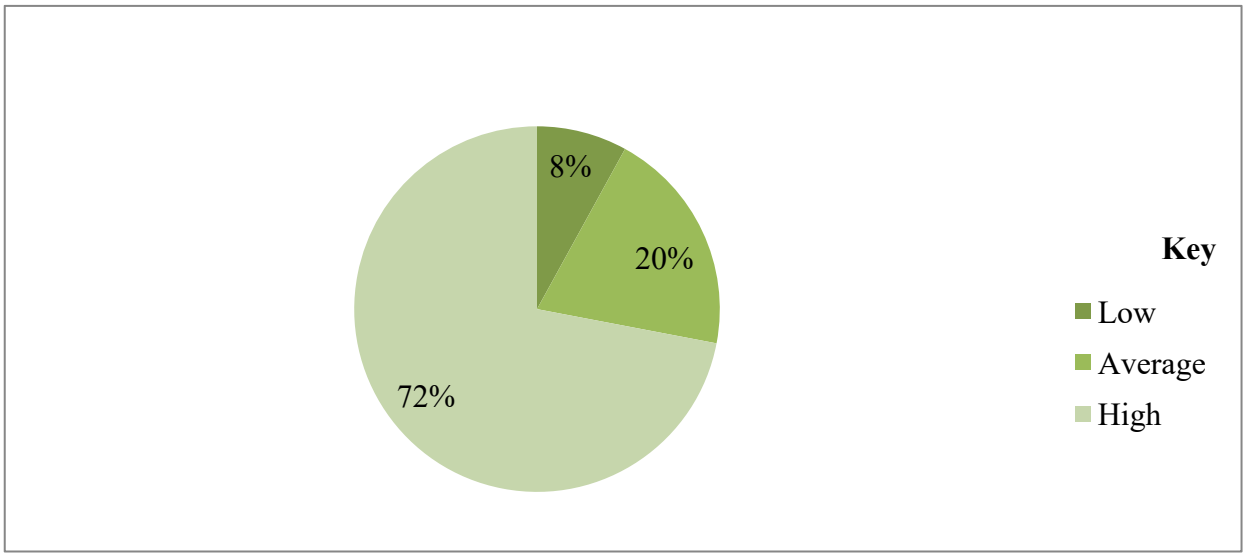
From table 7, more than half of the respondents (64%) reported that they last had in-service training regarding PPEs during the COVID-19 pandemic, whereas the least (6%) reported that they don't recall when they last had in-service training on PPEs.

Figure 7: Shows the distribution of respondents according to the rate the patient turns up in their departments

(N=50)



From Figure 7, the majority of the respondents (72%) reported that the rate of patient turn-up in their departments is very high, whereas the minority (8%) reported that the rate of patient turn-up in their department is very low.

Table 8: Shows the distribution of respondents according to whether the facility management strictly monitors and influence health workers to use personal protective equipment (N=50)

Response	**Frequency(f)**	**Percentage (%)**
Always they monitor health workers	20	40
Sometimes they do so	23	46
I am not sure	07	14
Total	**50**	**100**

From Table 8, most of the respondents (46%) reported that sometimes the facility management strictly monitors and influences health workers to use personal protective equipment, whereas the least (14%) were not sure whether the facility monitors and influences health workers to use personal protective equipment.

DISCUSSION

Individual factors contributing to the low uptake of personal protective equipment among health workers

Overall, findings revealed that all respondents had ever heard about personal protective equipment. This was highly foreseen since the study was conducted among health workers who are expected to be cognizant of the study perspective. The study results were in accordance with Jisa et al (2023), where all respondents were aware of personal protective equipment. The study further revealed that the majority of the respondents (70%) agreed that PPEs are effective in preventing hospital-acquired infections. This could probably be attributed to the fact that health workers had never used the PPEs, and they were protected from hospital common pathogens. The study results were in agreement with Emmanuel et al (2023), where the majority of the health workers (78%) agreed that personal protective equipment was very effective in preventing infections despite the low uptake. In regard to general awareness towards the importance of PPEs, more than half of the respondents (60%) reported that PPEs protect health workers from being at risk of pathogens. This greatly depicts that health workers had equitable knowledge towards PPEs, even though the knowledge didn't influence maximum uptake of the personal protective equipment. The study results were in line with Deress et al (2019), where 99.3% responded that safety precautions such as the use of PPE are important for healthcare facilities since they protect health workers from HAI. Nevertheless, almost all respondents (94%) were fully vaccinated for common pathogens. Therefore, even though a large number of participants were vaccinated, the least one was most likely to be at risk of being exposed to infections. Hence, influencing cases of HAI. The study results differ from those of Ahmed et al (2018), where (79.2%) of the study population did not complete their vaccination course against Hepatitis B. Remarkably, most of the respondents (48%) had taken a long time without reading the hospital's protective equipment policy. Such a response rate reveals that health workers were unenthusiastic about reading through the policy. This was comparable with Intan et al (2022), where (56.2%) of respondents had taken long without reading the facility policy regarding using personal protective equipment. The study also showed that the majority of the respondents (88%) had efficient skills in donning and doffing. This was highly achieved by the researcher after observation and remarks from several health workers. The study results were inconsistent with those of Mohammad et al. (2021), where 40.2% did not follow proper donning/doffing methods due to inadequate skills.

In reference to study findings, more than half of the respondents (68%) reported that they had minimal risk of nosocomial infection. This could be a result of the fact that they were vigilant in complying with standard precaution measures for PPE. The study results were in disagreement with Tanveer et al (2020), where (84.2%) of dental staff members perceived themselves to be at risk of getting infections. However, half of the respondents (50%) reported difficulties in breathing as the challenge they face while using PPEs. This reveals that the quality of the PPE they had was not user-friendly, which hence influenced the low uptake. The study results were not in line with Young et al, 2021), where results in regards to do you have any other challenge of PPE (eg, scrubs (tops/pants), gown, coverall, disposable apron, reusable apron) for body protection in your healthcare setting, 31% of the participants considered comfort ability as the biggest challenge when wearing PPE.

Health facility-related factors contributing to low uptake of personal protective equipment among health workers

The study further revealed that more than half of the respondents (70%) reported that they always get access to PPE. Therefore, since accessibility to PPEs is essential, but not all study participants agreed that they always get access to PPE, this gives a clear overview of low uptake of PPEs among those with inadequate access. An overview of PPE's inadequacy from different departments revealed that most of the respondents (38%) reported that masks are not usually accessible in their departments.

Therefore, they ended up not using the masks due to limited accessibility. The current study results were not in line with Bauer et al (2020), where 30.6% of hospital nurses and 17.1% of nursing home nurses were supplied with an insufficient number of FFP masks. The study revealed that the majority of the respondents (60%) reported>8 hours as the working duration at the facility. Such long working hours impose an impact on the utilisation of PPEs since most of the participants had concerns about facing challenges while using the PPEs. This was in agreement with Abdirahman et al (2022), where (58.3%) of the health workers worked more than eight hours a day. Findings from the study depicted that more than half of the respondents (64%) reported that they had last had in-service training regarding PPEs during the COVID-19 pandemic. This reveals that the hospital management often organises continuous education programs regarding PPEs. The study results were in line with Madziatera et al (2020), where 33 % of participants had been trained in the past 3 years in the proper use of PPEs.

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The study revealed that the majority of the respondents (72%) reported that the rate of patient turns in their departments is very high. Consequently, high patient turn-up and long working hours influence health workers to get tired of using some equipment. The study findings were equivalent to Alao et al (2020), where (68.9%) of respondents reported that patients turning up in their departments was very high. Most of the respondents (46%) reported that sometimes the facility management strictly monitors and influences health workers to use personal protective equipment. Therefore, squat monitoring of the hospital administration programs from different departments also had an impact on the uptake of personal protective equipment among health workers. The study results were quite similar to those of Intan et al (2022), where 66% of respondents who thought that the monitoring was inadequate did not use personal protective equipment, namely 45 respondents (45.0%).

Conclusion

Basing on the individual factors contributing to low uptake of personal protective equipment among health workers, the researcher discovered that even though general awareness towards personal protective equipment was outstanding but didn't influence the uptake of the equipment since (50%) of respondents faced challenges while using PPEs, few of the health workers (48%) kept informed about the hospital policy in regards to PPEs and not entirely all health workers had efficient skills in don and doff. In respect to health facility related factors contributing to low uptake of personal protective equipment among health workers, the study concealed that un equitable access to PPEs as only (70%) reported that they always get access to PPEs, long working hours (60%) reported that they work for >8 hours, inadequate access to in service trainings in regards to PPE's as noted by (64%), high patient turn up as noted by (72%) and low monitoring of the hospital administration programs from (46%) who reported that sometimes the facility management strictly monitors and influence health workers to use personal protective equipment.

Generally, the study discovered that average number of health workers faced challenges while using PPEs, few of the health workers were informed about the hospital policy in regards to PPEs, not entirely all health workers had efficient skills in don and doff, un equitable access to PPEs, long working hours, inadequate access to in service trainings in regards to PPE's, high patient turn up and low monitoring of the hospital administration programs were the outstanding factors contributing to low uptake of personal protective equipment among health workers at Kayunga regional referral hospital.

Recommendations

The researcher recommended that the Ministry of Health should provide timely access to PPE of good quality in government facilities, since inadequate PPE was one of the major concerns that were raised by health workers.

The researcher also recommends that the government of Uganda, through the Ministry of Health, should make sure that all government facilities have enough health workers compared to the ratio of patients who turn up, since most health workers were working overtime and they ended up not using PPEs.

In order to improve the uptake of PPEs, Kayunga regional referral Hospital administration must set up a committee that will critically monitor health workers from different departments regarding regular uptake of PPEs and receive timely feedback from health workers.

The study also emphasized that Kayunga regional referral hospital should continue to provide continuous education to health workers regarding PPE, rather than waiting for the period of epidemics. The training will help health workers to improve the uptake of PPEs.

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LIST OF ABBREVIATIONS

CAGR: Compound Annual Growth
COVID-19: Coronavirus Disease 2019
FFP : Filtering Face Piece
HCP : Health Care professional
USD : United States Dollar
WHO: World Health Organization

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The study was not funded

Conflict of interest

The author did not declare any conflict of interest

Author contributions

Lillian Namukasa collected data and drafted the manuscript of the study

Amiri Were supervised the study

Data availability

Data is available upon request

Author biography

Lillian Namukasa is as student of a diploma in clinical medicine and community health at Kampala school of health sciences

Amiri Were is a tutor at Kampala school of health sciences

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