Knowledge towards infection prevention and control measures among health workers at Kasangati Health Centre IV, Wakiso district. A descriptive cross-sectional study.

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Abstract
Background: Adherence to IPC measures is critical in preventing the spread of infections in healthcare settings. Ensuring that health workers adhere to IPC protocols is crucial for reducing the risk of infection transmission. This study aimed to determine the knowledge towards Infection Prevention and Control measures among health workers at Kasangati Health Centre IV, Wakiso District.
Methodology: A cross-sectional study design was conducted in which quantitative methods of data collection were employed, and 40 HWs were chosen to take part in the study. Simple random sampling technique and Kish Leshli's formula (1965) was used in sample size determination. A structured questionnaire was used to collect the data about: socio-demographic, knowledge, regarding IPC measures among HWs.
Results: A total of 77.5% of respondents rated their understanding of hand hygiene guidelines as good or excellent. Additionally, 62.5% correctly identified that hand hygiene should be performed before and after patient contact. Regarding personal protective equipment (PPE), 75% reported being well informed about correct usage during high-risk procedures. Half of the respondents (50%) indicated they could follow national IPC guidelines without assistance.
Conclusion: The poor knowledge, mainly due to inadequate regular training on IPC measures and limited resources, was significantly associated with the low compliance with IPC measures.
Recommendations: comprehensive and mandatory, regular IPC training is required, and the government should ensure continuous access to essential IPC resources to ensure proper adherence.

Keywords: Knowledge, Infection Prevention and Control, Health Workers, Kasangati Health Centre IV, Wakiso District

Background of the study

Infection prevention and control (IPC) measures constitute a fundamental aspect of modern healthcare systems, representing a many-sided approach aimed at reducing the risk of healthcare-associated infections (HAIs) and ensuring patient safety (World Health Organisation, Global strategy on infection prevention and control, 2022). HAIs encompassing a wide spectrum of infections acquired during the course of medical care pose a substantial burden on healthcare facilities worldwide, leading to increased morbidity, mortality, prolonged hospitalisations, and high economic costs (Stone et al., 2020). Therefore, according to the World Health Organisation (WHO), IPC measures contribute to community-wide efforts to control and reduce the impact of infectious diseases. (World Health Organisation, Infection prevention and control, 2023)

Globally, knowledge levels of HWs regarding IPC measures are often inconsistent, especially in LMICs. In Brazil, after undergoing IPC training, compliance with PPE use increased by 28%, from 63% to 91% (de Souza, Machado, & Silveira, 2021). Resource accessibilities come as the major and main reason for poor adherence to IPC measures. It is estimated that 15% of hospitalised patients in LMICs acquire HAIs, compared to 7% in high-income settings, highlighting the role of insufficient IPC knowledge (World Health Organisation, Clean care is safer care, 2018). In Saudi Arabia, 89.5% of HWs had a good understanding of IPC measures, but actual adherence to practices such as hand hygiene was only 56.3% (Almalki, Alshamrani, Alnasser, & Alzahrani, 2022)

In East Africa (Gichuhi, Kamau, Nyangena, & Otieno, 2021), the main challenges were discomfort, unavailability of PPE, and inadequate training on proper use. In Kenya, 88.9% HWs were aware of the importance of using PPE, but only 63.2% adhered to consistent PPE use.

In Uganda, the availability and quality of healthcare infrastructure and resources significantly influence IPC adherence of HWs (Makobore et al., 2020; Nakanjako et al., 2015). Poor IPC adherence affects the reliability of laboratory diagnostics conducted by HWs in Africa. Up to 12% of laboratory results in Uganda were compromised due to contamination resulting from lapses in IPC measures, leading to misdiagnosis and inappropriate treatment (Makobore, Kwizera, & Kiwanuka, Microbial contamination of laboratory-drawn blood cultures at Mulago National Referral Hospital in Kampala, Uganda: 2018).

At Kasangati HC IV, little data exist about knowledge towards IPC measures among HWs. However, some factors include: workload, knowledge levels, and resource availability. Therefore, the study aims to determine the knowledge towards Infection Prevention and Control measures among health workers at Kasangati Health Centre IV, Wakiso district.

Methodology

Study design

This study employed a cross-sectional study design that was used to collect quantitative data. Cross-sectional studies allowed conclusions to be drawn about the general population through enrolling the study population at a certain point in time. Data was collected at a particular point in time over a period of two months, and findings were obtained and analysed.

Study area

This study was conducted at Kasangati HC IV, Kasangati town, Wakiso district, located in Central Uganda. The facility was 15.5 km from Kampala city via Gayaza – Kampala Road. The coordinates of Kasangati town were 0°26'27.4" N, 32°36'08.3" E (Latitude: 0.440948; Longitudinal: 32.602308). The facility lay on the coordinates 0°26'05.9" N, 32°36'03.4" E (Latitude: 0.434980; Longitudinal: 32.600930).

This facility provided essential healthcare services to the indigenous people of the district and the people of the neighbouring districts of Nakaseke, Luweero, Mukono, Kalangala, Mpigi, and Mityana. This area was chosen for the study due to its convenience and easy access for the researcher.

Study Population

This study focused on health workers at Kasangati HC IV in Wakiso district who first consented to participate during the study. This study targeted those health workers who were present at the time of the study so that accurate and clear information could be obtained.

Sample size determination

The sample size was estimated using the Kish and Leis formula (1965) as stated below;

N = $(\boldsymbol{z}(\mathbf{1}-\boldsymbol{p}))/\boldsymbol{d_2}$

Where **n** = sample size required

z = **1.96** at **95%** confidence level

p = estimated number of health workers with poor adherence to IPC measures in Uganda = **60%**
(Nabirye, Muliira, & Batchelor-Maina, 2022)

d = estimated margin of error that would occur = **0.15**

Therefore: z = 1.96;

p = 0.6;

d = 0.15;

$$n = \frac{96^2 X 0.6(1-0.6)}{0.15^2}$$

n = 40

n = 40 health workers

The minimum sample size required was 40

Therefore, a total of 40 health workers were selected for data collection and generalised to the whole population.

Sampling technique.

A systematic sampling technique was employed. This is a probability sampling technique where an equal chance is given to each member of the population to be included in the sample. This was significant because there was no bias during data collection.

Sampling procedure.

The respondents were selected using a random sampling method where health workers at Kasangati HC IV were found in different departments and units in the facility until 40 participants were reached. By doing this, the researcher distributed self-administered questionnaires. This procedure was used to collect data from the health workers about their knowledge towards Infection Prevention and Control measures among health workers at Kasangati health centre IV, Wakiso district, for a period of two (2) months of the study.

Data collection method

The relevant data for this study were obtained using researcher self-administered questionnaires and questionnaire guides, where the sampled respondents were given questions in the English language, as stated in the objectives.

Data collection tools.

A questionnaire was used to collect information such as gender, age, years of experience, among others, and it contained closed-ended questions to be answered by the health workers.

Data collection procedure.
Closed and open-ended questionnaires were administered to the respondents to collect quantitative data. These respondents were given self-administered questionnaires in order to fill in the answers honestly; it was a less expensive procedure for data collection. Furthermore, questions were also asked using researcher-administered questionnaires and the responses were recorded until 40 respondents were interviewed.

Dependent variable.
Infection prevention and control.

Independent variable.
Knowledge among health workers.

Quality control.
To ensure valid and reliable research, the following were done;

Inclusion criteria.
All health workers at Kasangati HC IV who were present during the period of data collection and were willing to participate in the study. They were therefore consented to participate in the research study.

Exclusion criteria.
Health workers who were not present at the time of the study

Piloting study and pre-testing of questionnaires.
Here, ten (10) self-administered questionnaires were pre-tested using 10 respondents to assess for the reliability and variability of the questionnaires, which were revised to suit the realities through reconstruction of questions where necessary, or elimination of unnecessary questions.

Data analysis and presentation.
The researcher analysed the data using descriptive statistics such as measures of the central tendency, frequency, and percentage. In addition, a computer package spreadsheet software (Excel) was used in analysing information and reporting data. The researcher used tables, pie-charts and graphs in representing data.

Ethical considerations.
All participants were given written informed consent prior to their participation in the study. The participants retained the absolute right and freedom to decline to participate or withdraw from the study at any time with no consequence to them.

The aim and importance of the study was always made clear to the participants before taking part in the study. The health workers were given enough time to read and understand the consent form. This was provided in the English language.

Results

Socio-demographic characteristics of the study population

Table 1: Showing the socio-demographic characteristics of the study population

S/No.	Variables	Category	Frequency *n= 40*	Percentages (%)
1	Sex/Gender	Male	16	40
		Female	24	60
2	Age	20-29	12	30
		30-39	15	37.5
		40-59	8	20
		50 and above	5	12.5
3	Education level	Certificate/Diploma	38	95
		Bachelor's degree	2	5
		Master's degree	0	0
		Doctorate	0	0
4	Years of experience	Less than 5	14	35
		5-10	23	57.5
		11-20	3	7.5
		More than 20	0	0

From the table, the majority of the respondents who were interviewed were females, 60%, whereas 40% were males.

The majority (37.5%) belonged to the age group of 30-39, while 12.5% belonged to the age group of 50 and above. Based on the education level, a high number of the respondents (95%) were either at a certificate or diploma level, while the remaining 5% were at a bachelor's degree level. For the years of experience, 57.5% of the respondents had an experience between 5-10 years, and 7.5% had an experience between 11-20 years.

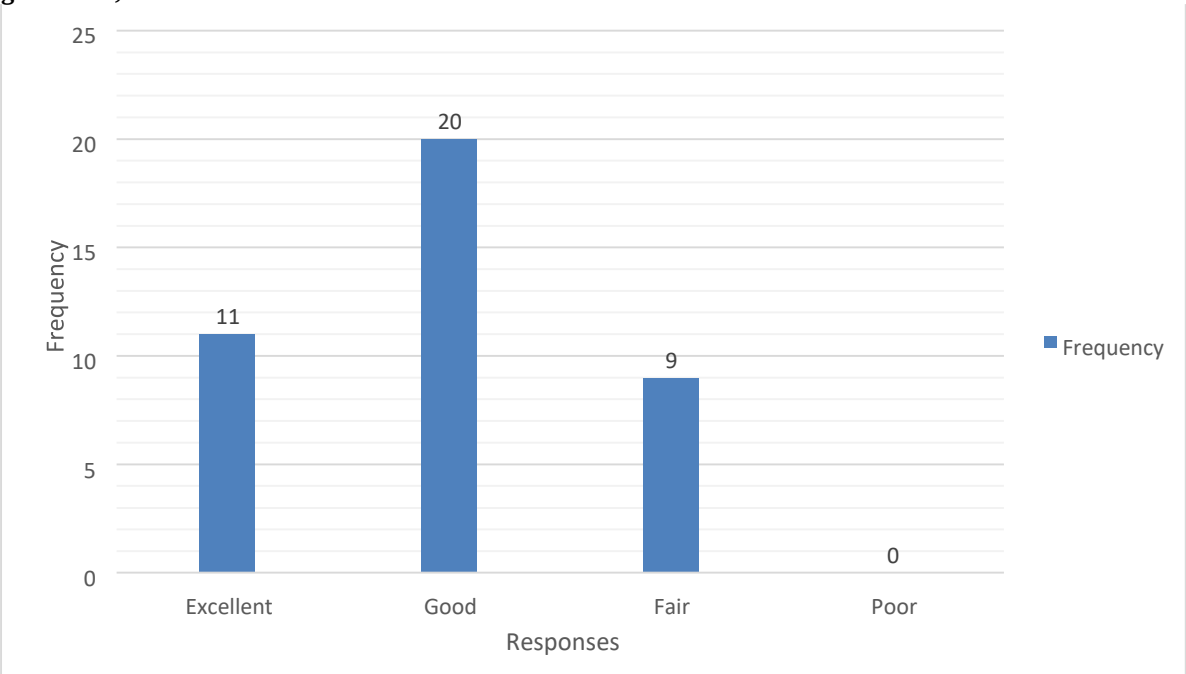
Knowledge regarding IPC measures among health workers

Table 2: Showing knowledge regarding Infection Prevention and Control measures among health workers

Variable	Response	Frequency *n=40*	Percentage (%)
Rating understanding of hand hygiene guidelines	Excellent	11	27.5
	Good	20	50
	Fair	9	22.5
	Poor	0	0
Knowledge on recommended frequency of hand hygiene	Always before and after patient contact	25	62.5
	Only after contact with contaminated surfaces	7	17.5
	Only when visibly soiled	8	20
	Unsure of the guidelines	0	0
Information about the correct usage of PPE during high-risk procedures	Very well informed	13	32.5
	Somewhat informed	17	42.5
	Slightly informed	10	25
	Not informed at all	0	0
Awareness of the national guidelines for infection prevention	Very aware and can follow without assistance	20	50
	Aware but needs occasional reminders	14	35
	Aware but unclear on specific details	6	15
	Not aware	0	0
Accessibility of IPC training and education in the facility	Regularly available and required	8	20
	Occasionally available but required	15	37.5
	Rarely available	17	42.5
	Not available at all	0	0

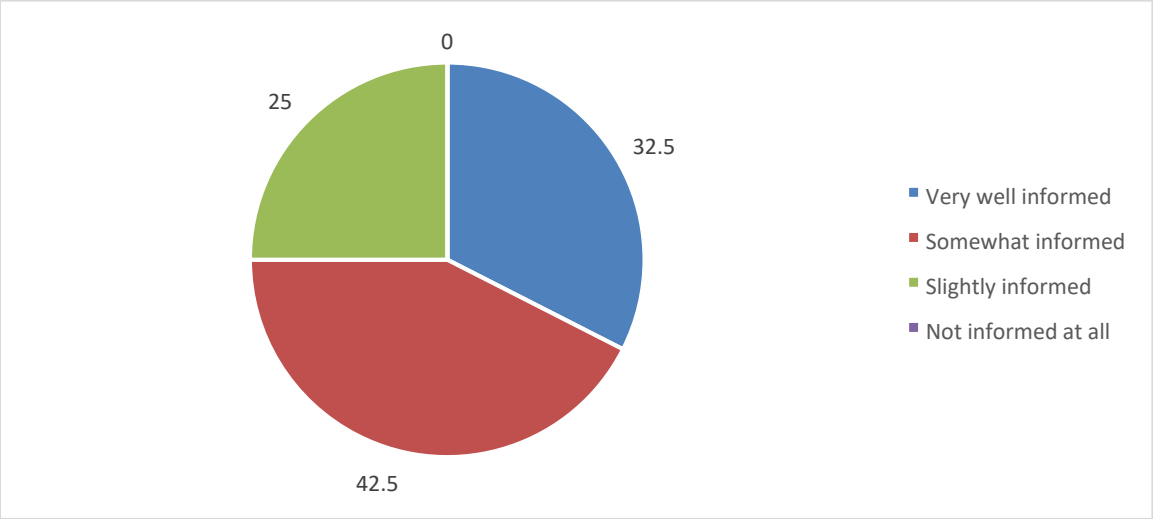
The table shows that the majority of the health workers 50% rated their understanding of hand hygiene guidelines as good, the 22.5% rated it as being fair. 62.5% of the respondents said that the recommended frequency of hand hygiene in a healthcare setting was always before and after patient contact, 17.5% said only after contact with contaminated surfaces. 32.5% of the respondents were very informed about the correct usage of PPE during high-risk procedures, while the 25% admitted being slightly informed. 50% of the health workers were very aware of the national guidelines for infection prevention and could follow without assistance, and the 15% were aware but unclear on specific details. Considering the accessibility of IPC training and education in the facility, the minority, 20% of the health workers, agreed that it's regularly available, while the majority 42.5% admitted that it's rarely available.

Figure 1: A bar graph showing the frequency of health workers' rate of understanding of hand hygiene guidelines, n = 40



From the graph, the majority of the health workers 50% rated their understanding of hand hygiene guidelines as good, the 22.5% rated it as being fair.

Figure 2: A pie chart showing respondents' information about the correct usage of PPE during high-risk procedures, n = 40



From the pie chart, a total of 75% of the respondents were well informed about the correct usage of PPE during high-risk procedures, and the remaining 25% admitted being slightly informed.

Discussion

The data analysis and presentation revealed that a significant portion of respondents (77.5%) of health workers rated their understanding of hand hygiene guidelines as good or excellent. This high self-reported knowledge level is consistent with findings from (Weber, utala, & SickbertBennett, 2020), which noted that 85% of healthcare workers in the United States were aware of proper hand hygiene techniques, but only 40% consistently adhered to these guidelines. However, it's important to note that awareness does not always translate to compliance, as workload and time constraints can hinder application in practice. The 22.5% of health workers with a lower rating in understanding may indicate that further training is required to ensure comprehensive knowledge across all healthcare workers.

The study showed that while around 75% of healthcare workers felt well-informed about PPE usage, a notable 25% were only slightly informed. This is concerning, as proper PPE usage is crucial for protecting both healthcare workers and patients. Similar knowledge gaps were noted in South Africa, where 84% of healthcare workers were knowledgeable about the use of PPE, but only 58% had consistent access to PPE during high-risk procedures (Hassan, 2020). This suggests that improving PPE training and access to PPE resources is essential for consistent IPC practice.

The study also revealed that 50% of respondents indicated that they were very aware and capable of following national IPC guidelines without assistance; there appears to be a strong foundational knowledge of regulatory protocols. However, the remaining 50% respondents either needed occasional reminders (35%) or were unclear about specific details (15%). This variability in guideline adherence aligns with findings from Oyapero & Jeboda (2020) in Nigeria, where heavy workloads contributed to lapses in guideline adherence, despite a high level of general IPC awareness.

Furthermore, the study also revealed that a larger portion (42.5%) of health workers reported that IPC training was rarely available. This finding of a lack of regular training availability is in line with a study conducted in Uganda, which revealed limited access to comprehensive IPC education, particularly in resource-constrained settings. This contributes to gaps in knowledge and awareness of IPC principles among healthcare workers. (Uganda Ministry of Health, 2019) (Uganda Bureau of Statistics, 2020). Therefore, regular and mandatory training programs are vital in maintaining up-to-date knowledge and skills among healthcare workers to reduce IPC breaches.

Conclusion

The study specifically sought to find out the knowledge towards Infection Prevention and Control measures among health workers at Kasangati Health Centre IV, Wakiso district. After carrying out the study, it was concluded that there was a strong foundation of knowledge among healthcare workers regarding IPC measures.

Recommendations

The health centre should implement mandatory, regular IPC training to maintain a high standard of knowledge and practice. Training sessions should be comprehensive, covering the latest IPC protocols and practical skills, such as PPE donning and doffing.

The facility leadership should actively demonstrate support for IPC protocols by fostering an award that prioritises infection control.

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List of Abbreviations

CDC: Centres for Disease Control and Prevention
HAIs: Healthcare-associated Infections
HC IV: Health Centre IV
HWs: Healthcare Workers
IPC: Infection Prevention and Control
LMICs: Low- and Middle-Income Countries
PPE: Personal Protective Equipment
UAHEB Uganda Allied Health Examination Board
WHO: World Health Organisation

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Conflict of Interest

The author declares no conflict of interest in conducting and reporting this study. The research was carried out independently, and the findings presented are unbiased and solely those of the researcher.

Author Contributions

SsekweYama Hashibu conceptualised the study, developed the research proposal, designed the data collection tools, conducted data collection, performed data analysis, and prepared the final research report. The research supervisors provided academic guidance, technical support, and critical review throughout the study process.

Data Availability

The data generated and analysed during this study are available from the corresponding author upon reasonable request. The data are not publicly accessible to maintain the confidentiality and privacy of the study participants.

Ethical Approval

Ethical approval to conduct this study was obtained from the relevant Institutional Research and Ethics Committee before data collection. Administrative permission was also sought from the study site authorities. The research adhered to ethical principles, including confidentiality, voluntary participation, and respect for participants' rights.

Informed Consent

Written informed consent was obtained from all participants before their inclusion in the study. Participants were informed about the purpose of the research, the procedures involved, potential risks and benefits, and their right to withdraw at any time without any consequences.

Author Biography

SsekweYama Hashibu is a student at International Paramedical Institute Maya. He has a keen interest in community health research and is passionate about generating evidence to improve healthcare service delivery and health outcomes in Uganda.

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