https://www.inosr.net/inosr-experimental-sciences/
Mukwaya
INOSR Experimental Sciences 12(2):132-146, 2023.

International Network Organization for Scientific Research ISSN: 2705-1692
https://doi.org/10.59298/INOSRES/2023/2.10.1000

Assessment of Infection Control Measures and Risk Factors at Kampala International University Teaching Hospital in Bushenyi District: A Study on Staff Awareness and Implementation

Mukwaya Isma

Faculty of Clinical Medicine and Dentistry Kampala International University Western Campus Uganda.

ABSTRACT

This research delved into the critical role of infection prevention and control in enhancing hospital care quality, particularly at Kampala International University Teaching Hospital. The primary aim was twofold: to identify risk factors associated with inadequate infection control and to evaluate the utilization of existing infection control measures among hospital staff. Conducted as a descriptive cross-sectional study within the hospital premises in Bushenyi District, the research engaged 100 respondents comprising various staff members employed at the institution, assessing their awareness of infection control through structured questionnaires. Although random sampling of 10 staff members was instrumental in refining the questionnaire for suitability, their results weren't incorporated into this study's findings. The respondent demographics showcased a predominant representation of nurses, with a majority being female employees and nearly four-fifths having worked at the hospital for less than four years. Notably, half of the respondents identified airborne infections as the most prevalent in the hospital setting. The study highlighted a positive inclination toward infection control tasks, with over 80% of participants acknowledging the effectiveness of infection control practices in curtailing the spread of infections among patients. Despite this awareness, the findings indicated a moderate level of overall awareness regarding infection control measures. While more than half of the respondents expressed favorable views on infection control practices and the utilization of available resources such as gloves, aprons, and hand hygiene, the implementation and adherence to standard precautions fell short of optimal levels. In conclusion, the study revealed a moderate level of awareness regarding infection control measures among hospital staff, with a majority holding positive attitudes toward the utilization of available resources. However, the actual implementation and adherence to standard precautions appeared suboptimal, signaling the need for enhanced efforts to bolster practice and compliance within the hospital setting.

Keywords: Infection, Infection control, Waste management, Hand washing.

INTRODUCTION

Infection prevention and control refers to practices aiming at decreasing healthcare-associated infections and nosocomial infections [1, 2]. Infection control is a very pertinent issue within clinical circles, public health, and among health service consumers, practiced within the confines of a particular healthcare delivery system rather than directed to society as a whole [3]. These infections have been with us since the time of antiquity and a number of reports on poor hospital hygiene have been published including reports about patients' fear of safety in hospitals [4, 5]. A healthcare or hospital-acquired infection also called nosocomial infection results from treatment procedures in a hospital or health service unit, while the patient

acquires an infection that she/he did not have prior to being admitted to the hospital [5]. Duse [6] reported that 25% or more of the hospitalized patients in developing countries acquire nosocomial infections. These infections are due to a variety of potential pathogens commonly found on hospital surfaces and anywhere in the hospital environment. Such pathogens include Clostridium difficile, vancomycin-resistant enterococci (VRE), and methicillin-resistant staphylococcus aureus all of which are less sensitive to most available antibiotics making hospital-acquired infection more difficult to manage than community-associated infections. Furthermore, these infections are the common cause of morbidity and the leading cause of death in patients admitted in hospitals with otherwise different medical conditions. In addition to increased morbidity and mortality rates associated with nosocomial infections, a significant loss of resources in health sectors has been realized as well [7]. Infection control is critical in improving the quality of care given to patients and as part of management in health services in that it addresses factors related to the spread of infections within a healthcare setting, whether patient to patient, from patient to staff, and from staff to patient or even among staff [3, 8]. Oosthuysen, et al. [9] emphasized that infection control is a very important policy due to the increasing prevalence of infectious diseases in hospitals or other healthcare settings. Also, infection control practice is an essential though often under-recognized and under-supported part of the infrastructure of healthcare [3], because the rapidly changing healthcare environment makes it difficult to protect patients and healthcare workers from transmission of pathogens [10]. Harris et al. [11] supported the view that hospital-acquired infections pose a threat to hospital workers, patients, and the community and represent a major cause of morbidity and mortality in hospitalized patients. Steeds et al. [12] highlighted that hospitals should ensure that the elimination of healthcare-associated infections become a priority of hospital quality and patient safety program as nosocomial infection outbreaks have been associated with the healthcare staff's poor compliance with and practice of standard precautions that include hand washing, safe injection practices and use of unsterilized surgical tools. Hand washing has been recognized as the most important means of preventing the transmission of infection, and great emphasis has been placed on ways to improve hand hygiene compliance by health workers [13-16]. Other protective measures such as masks, gloves, vaccination, and proper waste management are useful in ensuring that healthcare personnel do not get exposed unnecessarily to occupational-related infections or pass them on to patients [17]. Hospitals generate both medical and general wastes and waste generation depends on numerous factors such as established waste management methods, hospital specialization, and the proportion of patients treated on a daycare basis [3]. Hospital workers including support staff that is to say cleaning and working in the laundry section are at risk of exposure to potential life-threatening infectious agents. For example, in the US, more than 800,000 needle stick injuries occur each year despite continuing education and vigorous efforts aimed at preventing such accidents [3]. The rate of such infections ranges from as low as 1% in some countries in Europe and North America to 40% or more in many regions of the developing world [7]. Most of these infections are preventable with readily available and inexpensive strategies like adhering to the recommended practices, especially hand hygiene and wearing gloves.

It's widely known that infection control is a priority in delivering health care to patients in a hospital or any other healthcare setting. However, there is no doubt that mistakes are made in this practice that pose a threat to patients and healthcare providers. Healthcare workers have several in-service training sessions about infection control in addition to what they were taught at their medical schools of study. Despite all these efforts, there are increasing incidences of hospital-acquired infections. This shows that

infection is still an obstacle to providing quality health care to patients in hospitals. Hospital-acquired infections are a worldwide problem cutting across developed and developing countries. However, some countries like the US have come up with most sophisticated methods that have helped to reduce hospital-acquired infections to as low as 1%, such policies, strategies, and practices are not properly implemented and followed in most health facilities in Uganda which is the point of concern in this study. Also, several studies have shown that infection of surgical wounds in invasive procedures is 2-5% in patients with extra-abdominal surgeries, and orthopedic surgeries and as high as 20% in patients undergoing intra-abdominal surgeries. And in Uganda, 10% of the procedures become septic with staphylococcus aureus as the most common pathogen isolated and of these, about 30% of infected cases end up in morbidity or mortality [18]. This study aimed to identify risk factors associated with poor infection control and to determine which infection control measures are available at Kampala International University Teaching Hospital and how these measures are put to use by the staff working in the hospital.

METHODOLOGY

Study design

A descriptive cross-sectional study was used to assess infection control in the KIU teaching hospital.

Area of Study

The study was carried out at Kampala International University's western campus in Bushenyi district in western Uganda. Kampala International University's western campus is located 58 km away from Mbarara the nearest town, and it is located along the Mbarara-Kasese highway, 90km to Kasese town, and about 125km to Mpondwe, the border of Uganda with the Democratic Republic of Congo (DRC), and approximately 350km away from Kampala, the capital city of Uganda. It is a private university with a teaching hospital that trains medical, surgical, obstetrics, pediatric, education, and business administration courses, with a good road network system including both tarmac roads and marram roads, also with a good communication network since it is located near many radio stations like crane radio, B FM, hunter FM, and world FM. The major population is mostly students and the major economic activity around is trading with many food selling joints that serve the university students and administrators with food. Geographically, it is a hilly area with many swamps.

Study population

The study was carried out among KIU teaching hospital staff including the healthcare givers as well as the support staff irrespective of their levels of education or special training.

Inclusion criteria

Only the staff members who were present at the time the research was carried out were included in this study.

Exclusion criteria

Respondents who were away at the time the research was carried out were exempted from the study. Non-residents in the hospital were included in the study. Staff members who denied consent were not included in the study.

Sampling method

A research questionnaire with both structured questions was distributed randomly among 10 staff members in the hospital irrespective of whether they are part of the medical team or the hospital support staff.

Sample size determination

The number of participants was determined using Fischer's formula.

The formula $n=Z^2pq/d^2$

Where;

n= required sample size,

Z= value corresponding to 95% confidence interval for a standard normal distribution of 1.96,

P= proportion of the target population assumed to have a similar characteristic, which was estimated to be 90 %(0.9),

q= 1-p which is 0.1,

d= maximum accepted error = 0.05,

Substituting the values, $n= (1.96)^2 \times 0.9 \times 0.1 / (0.05)^2$ =138 respondents.

However, due to financial constraints and limited time resources, a sample size of 100 respondents was used.

Data collection

A questionnaire with structured questions addressing the research objectives was issued to the respondents who met the qualifications and consented. All respondents were given ample time to fill the questions completely. Assistance was given to respondents who found difficulties in interpreting scientific terminologies.

Data analysis

Data was analyzed manually using a scientific calculator in predesigned tables, relevant frequencies were attained by tally method and then the figures were manipulated to derive percentages and other derivations relevant to this study's interpretation of the raw data. Microsoft Excel was used to compute the obtained data.

Data presentation

The data was presented in the form of graphs, charts, percentiles, and tables depending on the data that the researcher will analyze.

Ethical consideration

A research proposal was submitted to Kampala International University Ethics and Research Committee and it will be approved. Permission was sought from Kampala International University's ethics and research office which introduced the researcher to the KIU teaching hospital administration. Participants were informed of their freedom to withdraw from the study without any penalty. Participants were given enough information on which they based their decision to participate in the study. Participants were assured of their confidentiality by not using their names for the study. There was no promise of reward for the participant either in cash or in kind.

RESULTS

Findings on the demographic profile of the participants.

Table 1 shows that the majority 46 (46 %) of the respondents were of age between 18-25 years and females made 60 (60%) and the rest 40 (40%) were males, most of these 78 (78%) had worked at the hospital for 0-4 years, 14 (14%) had worked for 5-9 years, none of the respondents had worked for 10-14 years and the rest 8 (08%) of the respondents had 15 years and above of service at KIU teaching hospital. Most of the respondents who participated in study 72 (72%) were nurses, 6 (06%) were medical officers, and the rest 22 (22%) were in the category of others.

Table 1: Personal data of the respondents

Personal Data	Frequency(F)	Percentage (%)
Age Of Respondents		
18-25	46	46.0
26-35	38	38.0
36-45	16	16.0
Total	100	100.0
Gender Distribution		
Male	40	40.0
Female	60	60.0
Total	100	100.0
Years Of Employment		
0-4	78	78.0
5-9	14	14.0
10-14	-	-
15 And Over	8	8.0
Total	100	100.0
Education Standards		
Nurse	72	72.0
Clinical officer	6	6.0
Doctor	-	-
Others	22	22.0
Total	**100**	**100.0**

Findings on risks associated with poor infection control

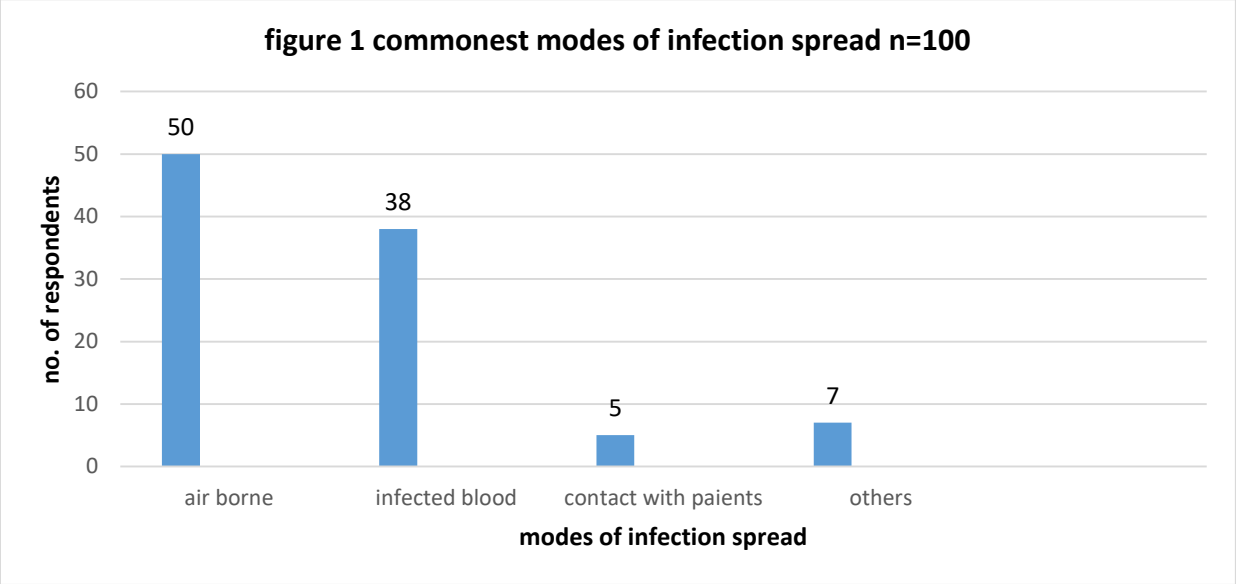

Figure 1 shows the commonest modes of disease spread in the hospital setting.

Outlines that most 50 (50%) of the respondents established that airborne mode is the commonest way infections spread, 38 (38%) established that infected body fluids, 05 (05%) also established that contact with the infected patients is the

most common mode and the rest 07 (07%) established that there are others modes of infection spread other than the ones mentioned above.

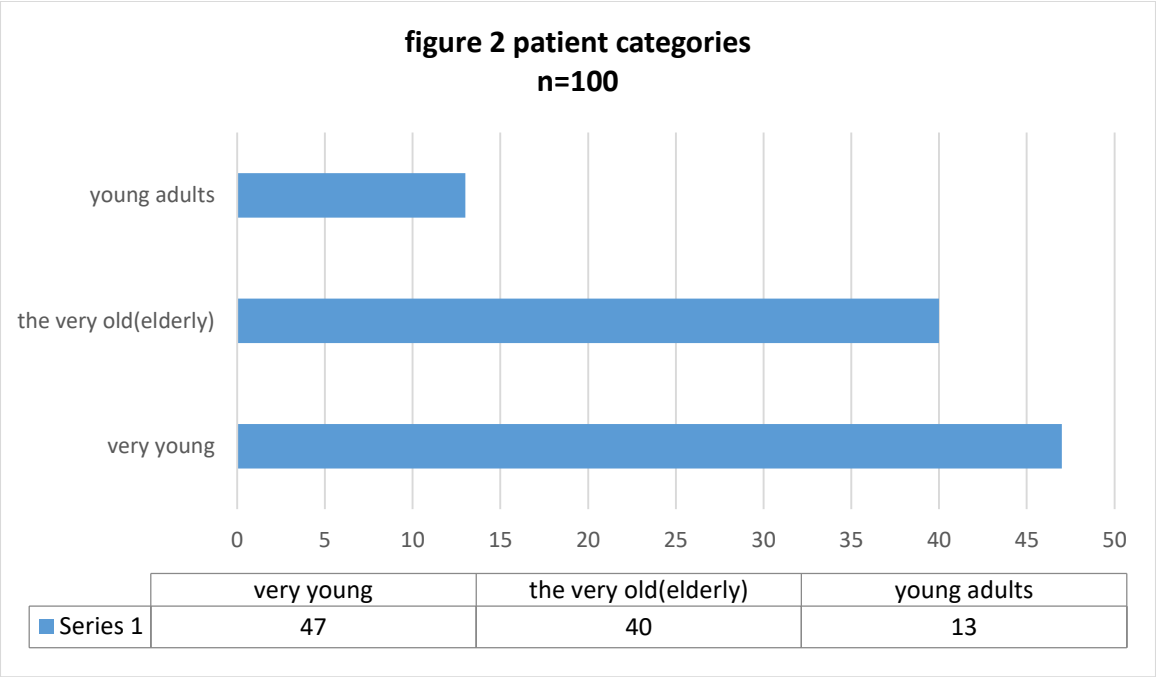

Figure 2: Showing individual groups of patients

Figure 2 shows that from this study, the majority of the respondents 47 (47%) established that very young children are a more susceptible group of patients to hospital-acquired infections, followed by the very old (elderly) 40 (40%) and the young adults 13 (13%) are the least susceptible group of patients to hospital-acquired infection.

Table 2: Infection spread due to overcrowding

	Response		
Statement	**Positive (%)**	**Negative (%)**	**Total (%)**
Does overcrowding spread infection in the wards?	98.0	02.0	100.0

Table 2 Shows that 98(98%) were aware that overcrowding facilitates infection spread and only 02(02%) were not aware.

Table 3: The common effects of hospital-acquired infections on a patient

Effect of hospital Acquired Infections to Patients	frequency	Percentage (%)
Prolonged hospital stay	29	29.0
Increased hospital charges	23	23.0
Increased antibiotics use	30	30.0
Compromise patient's health	18	18.0
Total	**100**	**100.0**

Table 3 Outlines that the most common disadvantage of hospital-acquired infections to the patient 30(30%) is increased antibiotic use, followed by prolonged hospital stay 29(29%), then increased hospital charges 23(23%), and lastly association with compromised patient health18 (18%).

Findings on infection control measures and how they are being utilized

Table 4: Assessment of infection control measures

Subject	frequency	Percentage (%)
How often do you empty the bins?		
Daily	46	46.0
Weekly	06	06.0
Whenever full	48	48.0
Total	100	100.0
When do you use an apron as a measure of infection control?		
When cleaning	26	26.0
Others	74	74.0
Total	100	100.0
Do you wear a mask every time you work?		
No	100	100.0
Total	100	100.0
Does hand washing with soup reduce infections?		
Yes	100	100.0
Total	100	100.0
Do gloves protect healthcare givers from needle pricks?		
No	100	100.0
Total	**100**	**100.0**

Table 4 shows that the majority 48 (48%) emptied bins when full, 46% emptied the bins on a daily basis, and only 6 (06%) emptied bins on a weekly basis, most of the respondents (74%) used apron for other reasons, 26 (26%) used aprons when cleaning and none of the respondents wore the apron every time or when handling body fluids. None of the respondents acknowledged wearing a mask every time they worked, all 100 (100%) supported the view that hand washing with soap reduces infections and also knew that gloves do not protect from needle pricks.

Findings on the practice of infection control following standard precautions of infection control.

Table 5: Assessment of compliance to standard precautions

Subject	frequency	Percentage (%)
Do you have a role in infection control?		
Yes	100	100.0
Total	100	100.0
Do you think lining the bins after they have been emptied is your responsibility?		
Yes	94	94.0
No	06	06.0
Total	**100**	**100.0**

Table 5 shows that 100 (100%) of the respondents declared they had a role in infection control, of these 92 (92%) had a good attitude of extending infection control to their homes. And 94(94%) showed that it's important to line the bins after they have been emptied.

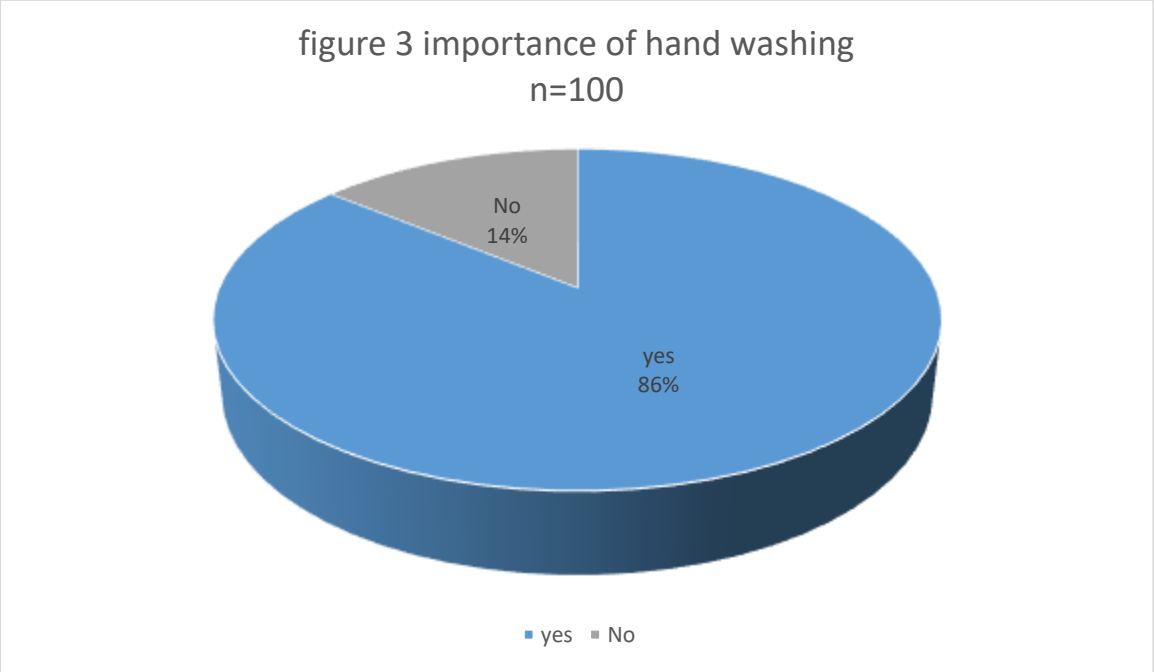

Figure 3: Shows the importance of hand washing.

Figure 3 highlights that the majority of the respondents 80(80%) practiced infection control to decrease risks of transmission of disease to patients, it was also established that 14(14%) practiced infection control to avoid disciplinary action against them, 06(06%) of the respondents had other reasons and none of the respondents was driven by an award for his/her performance in infection control.

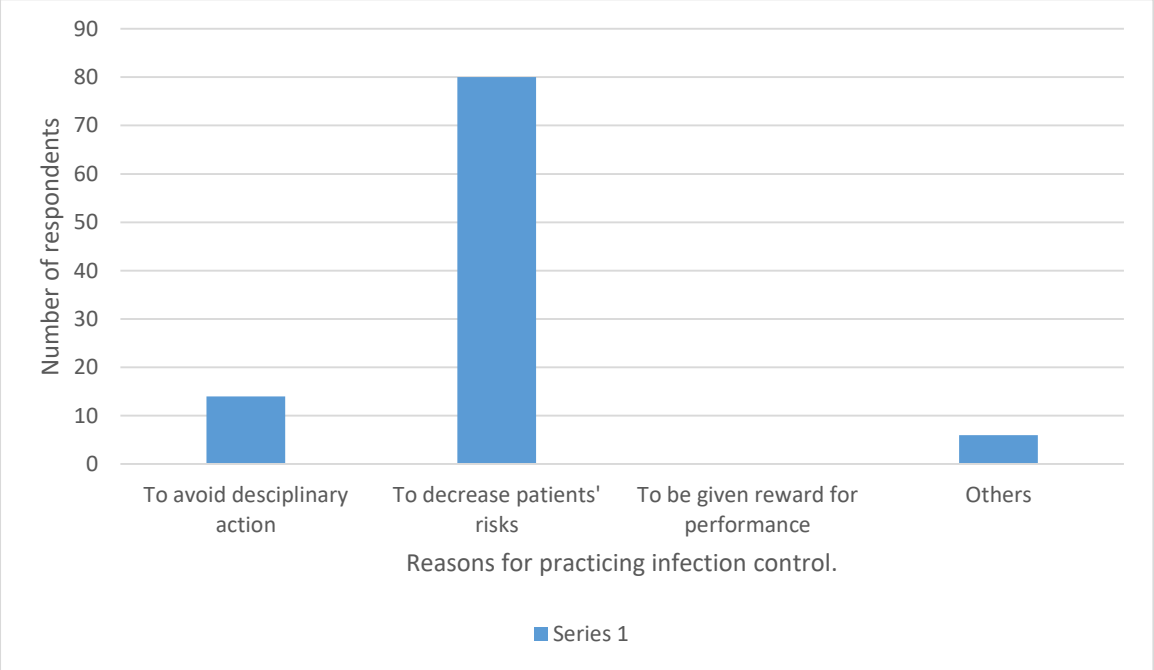

Figure 4: Reasons why the respondents practiced infection control

Table 6: Response to statements on infection control tasks.

Statement on infection control tasks.	Response		
	Positive (%)	Negative (%)	Total (%)
Feeling about the role in infection control.	95.0	05.0	100.0
Feeling about wearing a mask.	82.0	18.0	100.0
Suggestions about segregation of wastes.	87.0	13.0	100.0

Table 6 Outlines that almost all over 80% of the responses pertaining to infection control tasks was positive. That is, the majority 95%, 82%, and 87% gave positive responses for preventing infection spread.

Table 7: Suggestions of staff regarding infection control.

Suggestions	Frequency	Percentage (%)
Provision of more protective clothing and cleaning materials.	64	64.0
Provision of training and close supervision of staff members in infection control and related disciplines.	36	36.0
Total	**100**	**100.0**

Table 7 Shows that when the respondents were asked to make suggestions on infection control, 64 (64%) suggested that there should be the provision of adequate supply in terms of protective clothing and more cleaning material, while the rest 36(36%) suggested that training and close supervision of staff members in the area of infection control would make infection control practice a success.

DISCUSSION

The study explored mainly; the risks associated with poor infection control, measures of infection control employed and how they are being used, and the compliance to standard precautions of infection control among staff members. The findings of the study gave a wide perspective on how infection control is practiced at KIU teaching hospitals.

Respondents' demographic profile

The study targeted staff members at KIU Teaching Hospital of the age of 18 years and above irrespective of sex and education standards.100 respondents was assessed and of these, the majority 46(46%) were aged 18-25 years, 38(38%) were aged 26-35 years, the rest 16(16%) were aged 36-45 years and none of the respondents were aged above 45. This shows that the study was dominated by a young population of health workers aged 45 years and below. 60(60%) of these participants were female and the rest were males 40(40%). This implied that more females availed themselves for the study compared to males, this could be that women are easy to approach, willing to participate, and posed little resistance to the researcher as opposed to their male counterparts, other factors for this phenomenon could be that women are hygienic hence, more interested in matters relating to hygiene and infection control. The biggest percentage 72% of the respondents were nurses, clinical officers made up 06%, and the rest 22% belonged to other categories of hospital staff including laboratory technicians, cleaners, administrators, and hospital guards. This showed that nurses were enough and easily accessible compared to the doctors who are few in such a remote hospital and could have been busy during this period hence being unable to participate in this study. It was also noted that most of the respondents 78 (78%) had worked for not more than 4 years at this facility, meaning that most of the staff were newly employed and only a few 08 (08%) were among the pioneer staff of KIU teaching hospital and these were members of the board of governors who

had worked with the hospital since it started that is, more than 15 years ago. A study in Mazardaran Hospital, on the knowledge and practice of healthcare workers and medical students towards universal precautions showed an association between years of experience and knowledge; in this study, it was pointed out that those with fewer years of experience had higher knowledge scores [19]. However, on the contrary, Vaz et al. [20] found that healthcare workers employed for a longer period of time were aware of the precautions compared to those with less experience. However, such studies were among individuals with a defined education level, therefore since this study involved all staff members at KIU teaching hospital and included those with no education at all, the results may be different from those obtained by the early studies. This is because some staff members because of their low level of education may find it hard to improve on their knowledge as they are unable to read since the guidelines are in written format.

Risks associated with poor infection control measures

The study results show that half 50(50%) of the respondents choose airborne infections as the most frequently experienced illnesses acquired by hospitalized patients possibly due to the fact that these diseases are very contagious and if combined with other factors such as overcrowding, the efficiency of their spread is enhance. For instance, considering a patient with an active infectious respiratory disease like tuberculosis placed in the same ward with other patients due to lack of enough facilities, the pathogenic organisms are spread into the air once he/she coughs or sneezes and these organisms are easily accessible by everyone sharing the room with the patient hence increasing the likelihood of acquiring the disease by individuals. In a similar study by Duse [6], it was documented that among all patients who need hospitalization in developing countries, 25% or more develop a nosocomial infection irrespective of age and route of infection transfer. However other potentially dangerous and equally effective modes of infection spread include infected body fluids, contact with infected persons, needle stick injuries, nursing procedures such as catheterization, and support ventilation equipment and they should not be overlooked. The majority 47(47%) revealed that very young children are the most prone category of hospitalized patients to infections probably because the individual category has a weak immunity and is unable to withstand even minor infections. This study found out as did Zaidi et al. [21] in a study about neonatal infection among hospital-born babies in developing countries in comparison with their counterparts in developed countries which reported that the rate of neonatal infections in hospitals found in developing countries was up to twenty times higher than the rate reported for hospital babies in developed countries. However, the elderly were also a special group that indeed required attention as their immunity tends to deteriorate markedly at extremes of age. The immunosuppressed young adults for example, those with HIV/AIDs, patients on cancer chemotherapy, and those receiving immunosuppressive medication after organ transplant are also less resistant to microorganisms that that would otherwise not cause disease in normal healthy individuals. Individuals with compromised immunity are at a greater risk of infection [22-25]. More than 90% knew that overcrowding eases the spread of infections in hospital wards. A related study by Lin *et al.,* [26] found that 77% of *Klebsheila pneumonia* pathogens are transmitted through patients' stool which implies that if patients are overcrowded, there is an increased incidence of illnesses caused by such virulent organisms. These results also reveal the spread of most airborne diseases such as tuberculosis to patients neighboring a patient with an active disease. Most respondents 30(30%) revealed that hospital-acquired infections are difficult to manage and hence cause increased use of antibiotics. A related study by Mathur et al. [27] suggested that due to excessive

use of antibiotics, there has emerged resistant strains of microorganisms some of which are believed to cause most hospital infections. And for this reason, hospital-acquired infections are hard to treat.

Infection control measures and how they are being utilized

More than half of the respondents 74(74%) used an apron only when the potential of getting infected is anticipated, that is when visiting the theatre, attending to a mother giving birth in the delivery room, and other procedures that may involve getting into contact with the patient's body fluids that may be infectious rather than wearing an apron all the time. This study found relatively the same results as did the study conducted in South Africa by Rebecca Peta [3] which revealed that 75% of the respondents knew the correct use of aprons. When an apron is worn all the time it may turn out a potential source of infection since a health worker may rotate in various units of the hospital a day hence causing infection to the patients he or she sees after visiting isolation rooms. Many studies have documented the potential of disease transmission through the protective clothing of health workers. All respondents 100(100%) knew how to use the masks correctly and in clinically reasonable situations such as attending to a tuberculosis patient with active disease or sick health personnel with a respiratory illness may put on a mask to protect his or her patient from contracting the illness. A similar study by Peta [3] among general assistants showed that 35% of them knew the correct use of masks. The deviation from these results could be inclined to the fact that the respondents in this study were interviewed by the researcher himself and the interaction was face to face this could have influenced the results since the asking of questions and interpretation of answers was consistent since it was the same interviewer. All respondents 100(100%) agreed that gloves do not protect health workers from needle stick injuries. This study found similar results as did Dodds *et al.* (2010) that wearing gloves alone does not protect one from injury with sharp instruments like needles. Groos *et al.* [28] reported that the rate of occurrence of glove puncture during usual surgical procedures was 11.5% to 53%. The majority of respondents emptied bins whenever they got full and one of the reasons for this practice was to avoid spillage or scattering of the waste as most hospital wastes are potentially infectious. There are publications about waste management but a document that was specifically about the frequency of emptying bins in a hospital setting was not accessed. Practice of infection control following standard precautions of infection control. From the results, it is noted that all 100(100%) respondents knew they had a role in infection control. A similar study by Peta [3] in South Africa revealed that 84% reported having a role in infection control. This shows that in any healthcare setting, the majority of the staff are aware that they have a role to play as pertains to infection control. More than three-quarters of respondents 80(80%) in this study practiced infection control to reduce patients' chances of acquiring disease as many knew that this is one of the ways of providing quality healthcare without patients' worry about their safety in the hospital. In a similar study by Okhiai *et al.* [29] among 30 theatre personnel in Irrua specialist teaching hospital it was also revealed that 80% agreed that infection control applies to all patients regardless of presumed health status. Above three-thirds of respondents 90(90%) agreed that they are responsible for lining the bins after they have been emptied, this should be that it makes the hospital environment tidy and reduces chances of disease spread due to scattering of wastes after spilling or falling off the full bins. In a similar study conducted by Okhiai *et al.* [29], it was found that 90% knew proper handling of wastes through observation of standard precautions and guidelines. The majority 86(86%) agreed that hand washing is necessary every time the health worker touches a patient and before touching the next patient. A similar study by Dhyana *et*

al. [30] about hand washing also inferred that the majority 94.7% of the staff strongly agreed that they follow hand washing before and after treating patients. Similarly, a study by Huis *et al.* [31] about hand hygiene showed that among health staff, Nurse's knowledge about standard precautions is insufficient as many believed that by wearing gloves, there is no need for washing hands. This could be one of the reasons why the rest of the respondents 14(14%) did not agree. 80(80%) gave positive responses to infection control tasks. A similar study by Okhiai et al. [29] revealed that 83.3% of the respondents had positive attitudes toward standard precautions of infection control. More, than half 64(64%) of respondents recommended the provision of adequate supplies in terms of protective clothing and more cleaning materials. Similar studies conducted by Oliveira et al. [32] and Gershon et al. [33] revealed that lack of self-protection and inability to access necessary equipment or facilities are some of the factors that negatively influence compliance.

CONCLUSION

All the respondents 100(100%) knew that they have a role in infection control, however, there is a lag in practice and compliance with standard precautions of infection control. Although the hand washing campaign has been ongoing for years, the practice is less observed in clinical practice and has become one of the major pitfalls health workers face because it contributes to the spread of many diseases. Due to limited supplies, and inadequate knowledge about most medical instruments like cleaning and sterilization machines, infection spread is still ongoing in hospitals or any other health facility without these measures. There is a need for education on the importance of hospital waste management, over-crowding inpatient wards is the leading cause of transmission of airborne infections due to the closeness of the patients and attendants. The very old and the very young hospitalized individuals are more likely to develop illness in hospitals due to low or reduced immunity at extremes of age as compared to adult youths.

Recommendations

Continuous health visits by the Ministry of Health (MOH) of Uganda to the hospital and evaluation of the practices to ensure compliance to ensure that the health workers practice infection control following the standard guidelines. Encourage hand washing or use of alcohol hand sanitizers with alcohol or other antiseptics as a measure of disinfection of hands before or after handling a patient. The government should ensure a continuous supply of equipment and protective clothing such as aprons eye masks, and gloves in adequate quantities and quality, this provides the safety of workers from contact with infectious agents. Waste management should be emphasized by hospital staff by providing bins for all types of waste products and these may be placed in every ward to avoid scattering of waste. Hospitals should develop an isolation unit for patients with active infectious diseases such as TB to avoid spreading to other patients in the same ward. Overcrowding should be dealt with promptly by building enough room to accommodate the patients. When managing individuals at extreme age, i.e. newborns and very old patients, one should bear in mind that these are special categories of patients and a lot of care and attention should be employed in their management.

REFERENCES

1. Nwovu, A. I., Ifeanyi, O. E., Uzoma, O. G., & Nwebonyi, N. S. Occurance of Some Blood Borne Viral Infection and Adherence to Universal Precautions among Laboratory Staff in Federal Teaching Hospital Abakaliki Ebonyi State. *Arch Blood Transfus Disord*, 2018; 1(2).
2. Alkali, B., Agwu, E., Sarkinfada, F., Idris, A. M., and Mada, S. B. Correlation of nosocomial infection with prolonged hospital stay in Kano Nigeria. *Bayero*

Journal of Pure and Applied Sciences, 2020;12(2), 149-155.
3. Peta, M. R. Knowledge, attitude and practice of general assistants toward infection control at Letaba Hospital, 2014. http://hdl.handle.net/10539/17335
4. Tutu, R. A., Gupta, S., Elavarthi, S., Busingye, J. D., & Boateng, J. K. Exploring the development of a household cholera-focused health literacy scale in James Town, Accra. *Journal of Infection and Public Health*, 2019;12(1), 62-69.
5. Vincent, C. N., Asodike, M. C., Naze, N. S., Echendu, G. E., Iwuchukwu, I., & Udemba, N. Knowledge, attitudes and practices of nurses regarding infection prevention and control in imo state university teaching hospital (imsuth), orlu, imo state, Nigeria. *European Journal of Pharmaceutical and Medical Research*, 2021; *8*(6), 127-134.
6. Duse, A.G. Infection control in developing countries with particular emphasis on South Africa. *The South African Journal of Epidemiology and Infection.* 2010; 20(2), 37-39.
7. Wasswa, P., Nalwadda, C.K., Buregyeya, E. *et al.* Implementation of infection control in health facilities in Arua district, Uganda: a cross-sectional study. *BMC Infect Dis* **15**, 268 (2015). https://doi.org/10.1186/s12879-015-0999-4
8. Minnaar, A. Infection control made easy; hospital guide for health professionals. Pretoria, Juta, 2008.
9. Oosthuysen, J., Potgieter, E. and Blignaut, E. Compliance with infection control recommendations in South Africa dental practice: A review of studies published between 1990 and 2007. International Dental Journal. 2010; 60(3), 181-189.
10. Chan, M.F., HO, A. and Day, M.C. Investigating the knowledge, attitudes and practice patterns of operating room staff towards standards and transmission –based precautions: Results of a cluster analysis. Journal of Clinical Nursing. 2007; 17(8), 51-62.
11. Harris, A.D., Samore, M.H., Nafziger, R., DiRosario, K., Roghmanns, M.C. A survey on hand washing practices and opinion of healthcare workers. Journal of hospital infection. 2000; 45(4), 318-321.
12. Steed, C., Kelly, J., Blackhurst, D. *et al.* Hospital hand hygiene opportunities: where and when (HOW2)?. *BMC Proc* **5** (Suppl 6), P112 (2011). https://doi.org/10.1186/1753-6561-5-S6-P112.
13. Asogwa, F. C., Okoye, C.O.B., Ugwu, O. P. C., Edwin, N., Alum, E. U. and Egwu, C. O. Phytochemistry and Antimicrobial Assay of *Jatropha curcas* Extracts on Some Clinically Isolated Bacteria - A Comparative Analysis. *European Journal of Applied Sciences,* 2015; **7**(1), 12-16. DOI: 10.5829/idosi.ejas.2015.7.1.1125.
14. Alum, E., Uti, D., Agah, V., Orji, O., Ezeani, N., P.C., U., Omang, W., Itodo, M.: Physico-chemical and Bacteriological Analysis of Water used for Drinking and other Domestic Purposes in Amaozara Ozizza, Afikpo North, Ebonyi State, Nigeria. *Nigerian Journal of Biochemistry and Molecular Biology*. 2023; 38(1), 1–8 (2023). https://doi.org/10.2659/njbmb.2023.151.
15. Asogwa, F. C., Ugwu, O. P. C., Alum, E. U., Egwu, C. O., Edwin, N. Hygienic and Sanitary Assessment of Street Food Vendors in Selected Towns of Enugu North District of Nigeria. *American-Eurasian Journal of Scientific Research*. 2015; **10** (1), 22-26. DOI: 10.5829/idosi.aejsr.2015.10.1.1145.
16. Damilare, O. K. Hand washing: an essential infection control practice. *International Journal of Caring Sciences*, 2020; 13(1), 776-780.
17. Mill, J., Nderitu, E., Richter, S. Post-exposure prophylaxis among Ugandan nurses accidents do happen. *International Journal of Africa Nursing Sciences*. 2014; 1, 11-17.
18. Ozgediz, D., Galukande, M., Mabweijano, J., Kijjambu, S., Mijumbi, C., Dubowitz, G., Kaggwa, S., Luboga, S. The neglect of the global surgical workforce: experience and evidence from Uganda. World J Surg. 2008

Jun;32(6):1208-15. doi: 10.1007/s00268-008-9473-4.

19. Motamed, N., BabaMahmoodi, F., Khalilian, A., Peykanheirati, M., Nozari, M. Knowledge and practices of health care workers and medical students towards universal precautions in hospitals in Mazandaran Province. East Mediterr Health J. 2006 Sep;12(5):653-61.

20. Vaz, K., McGrowder, D., Alexander-Lindo, R., Gordon, L., Brown, P., Irving, R. Knowledge, awareness and compliance with universal precautions among health care workers at the University Hospital of the West Indies, Jamaica. Int J Occup Environ Med. 2010 Oct;1(4):171-81.

21. Zaidi, A. K., Huskins, W. C., Thaver, D., Bhutta, Z. A., Abbas, Z., Goldmann, D. A. Hospital-acquired neonatal infections in developing countries. Lancet. 2005 Mar 26-Apr 1;365(9465):1175-88. doi: 10.1016/S0140-6736(05)71881-X.

22. Alum, E. U., Ugwu, O. P. C., Obeagu, E. I., Aja, P. M., Okon, M. B., Uti, D. E. Reducing HIV Infection Rate in Women: A Catalyst to reducing HIV Infection pervasiveness in Africa. International Journal of Innovative and Applied Research. 2023; 11(10),01-06. DOI: 10.58538/IJIAR/2048. http://dx.doi.org/10.58538/IJIAR/2048

23. Obeagu, E.I., Alum, E.U. and Obeagu, G.U. Factors Associated with Prevalence of HIV Among Youths: A Review of Africa Perspective. *Madonna University Journal of Medicine and Health Sciences*, 2023; **3**(1), 13-18. https://madonnauniversity.edu.ng/journals/index.php/medicine

24. Uti, D. E., Ibiam U. A., Omang, W. A., Udeozor, P. A., Umoru, G. U., Nwadum, S. K., Bawa, I., Alum, E. U., Mordi, J. C., Okoro, E. O., Obeten, U. N., Onwe, E. N., Zakari, S., Opotu, O. R., Aja, P. M. Buchholzia coriacea Leaves Attenuated Dyslipidemia and Oxidative Stress in Hyperlipidemic Rats and Its Potential Targets In Silico. *Pharmaceutical Fronts.* 2023; 05(03), e141-e152. DOI: 10.1055/s-0043-1772607.

25. Alum, E. U., Obeagu, E. I., Ugwu, O. P. C., Samson, A. O., Adepoju, A. O., Amusa, M. O. Inclusion of nutritional counseling and mental health services in HIV/AIDS management: A paradigm shift. Medicine. 2023;102:41(e35673). http://dx.doi.org/10.1097/MD.0000000000035673.

26. Lin, Y. T., Wang, Y. P., Wang, F. D., Fung, C. P. Community-onset *Klebsiella pneumoniae* pneumonia in Taiwan: clinical features of the disease and associated microbiological characteristics of isolates from pneumonia and nasopharynx. Front Microbiol. 2015 Feb 18;6:122. doi: 10.3389/fmicb.2015.00122.

27. Mathur, P., Kapil, A., Das, B. Nosocomial bacteraemia in intensive care unit patients of a tertiary care centre. *Indian J Med Res.* 2005;122:305–8.

28. Gross, D. J., Jamison, Y., Martin, K., Fields, M., Dinehart, S. M. Surgical glove perforation in dermatologic surgery. J Dermatol Surg Oncol. 1989 Nov;15(11):1226-8. doi: 10.1111/j.1524-4725.1989.tb03236.x.

29. Okhiai, O., Nwaopara, A.O., Omoregbe. F.I.; Izefua. E., Nwadike. G.I.; et al. Knowledge, attitude and practice of standard precautions among theatre Personnel in Irrua specialist teaching hospital. *International Journal of Basic, Applied and Innovative Research*. IJBAR**.** 2014**;3**(4): 147-153.

30. Dhyana Sharon Rose, Dr. Vasantha et al. A study on hospital-acquired infections (HAIs), control and management. International Journal of Innovative Research in science, Engineering and Technology. 2014; Vol. 3 ISSN: 2319-8753.

31. Huis, A., van Achterberg, T., de Bruin, M. *et al.* A systematic review of hand hygiene improvement strategies: a behavioural approach. *Implementation Sci* **7**, 92 (2012). https://doi.org/10.1186/1748-5908-7-92

32. Oliveira, A.C., Cardoso, C.S. and Mascarenhas, D. Contact precautions in intensive care units: facilitating and inhibiting factors for professionals'

adherence. Rev Esc Enferm USP; 2010; 44(1),161-165.

33. Gershon, R.R., Vlahov, D., Felknor, S.A., Vesley, D., Johnson, P.C., Delclos, G.L. and Murphy, L.R. Compliance with universal precautions among health care workers at three regional hospitals. Am J Infect Control. 1995;23(4),225-236.

CITE AS: Mukwaya Isma (2023). Assessment of Infection Control Measures and Risk Factors at Kampala International University Teaching Hospital in Bushenyi District: A Study on Staff Awareness and Implementation. INOSR Experimental Sciences 12(2):132-146.https://doi.org/10.59298/INOSRES/2023/2.10.1000