

HEALTH FACILITY FACTORS ASSOCIATED WITH INCREASED CASES OF NOSOCOMIAL INFECTIONS AMONG PATIENTS IN THE INTENSIVE CARE UNIT AT JINJA REGIONAL REFERRAL HOSPITAL. A CROSS-SECTIONAL STUDY.

Edgar Sserugo, Jacob Usuo Kibuuka.
Kampala University School of Nursing and Health Sciences.*

Page | 1

Abstract

Background

According to the HMIS report at Jinja Regional Referral Hospital, it was found that 350 patients acquired nosocomial infections in 2021, 475 patients in 2022, and 490 patients in 2023, showing a striking increment in the prevalence of nosocomial infections which raises a major public health concern. This study aimed to identify health facility factors associated with increased cases of nosocomial infections among patients in the intensive care unit at Jinja Regional Referral Hospital.

Methodology

A cross-sectional descriptive study with quantitative method of data collection was employed which involved 32 respondents selected by simple random sampling method. Data was collected using pre-tested questionnaires.

Results

14(44%) were married, majority of the respondents 16(50%) went up to primary level, 18(56%) were unemployed. 30(94%) of the respondents never had health education or sensitization about nosocomial infections at the health facility, 25(78%) reported that there are inadequate health workers to offer treatment at the health facility, 12(38%) of the respondents reported that there are no infection control guidelines at the health facility and 16(50%) strongly disagreed that there were inadequate waste bins for waste segregation at the health facility.

Conclusion

There is a challenge in the implementation of infection prevention and control among patients and health workers due to knowledge gaps thus increased nosocomial infection outbreaks

Recommendation

Implementation of comprehensive infection control programs and surveillance of infections in hospitals by infection control committee, health education of hospital staff and patients on nosocomial infections to protect themselves from the contaminating microorganisms as well as from spreading pathogenic microorganisms themselves.

Keywords: Jinja Regional Referral Hospital, Nosocomial infections, Health facility factors.

Submitted: December 11, 2024 **Accepted:** November 22, 2025 **Published:** April 01, 2026

Corresponding Author: Edgar Sserugo*

Kampala University School of Nursing and Health Sciences.

Background

The US Centre for Disease Control and Prevention identified that nearly 1.7 million hospitalized patients annually acquire health care-associated infections while being treated for other health issues and that more than 98,000 patients (1 in 7) die due to HCAs (Mainul et. al, 2018). According to the HMIS report at Jinja Regional Referral Hospital, it was found that 350 patients acquired nosocomial infections in 2021, 475 patients in 2022, and 490 patients in 2023, showing a striking increment in the prevalence of nosocomial infections which raises a major public health concern.

Wasswa et. al, (2015), in their study on the implementation of infection control in health facilities, found that there were

insufficient infection control supplies in most of the health facilities, health care workers were more likely to wash their hands if they had ever received in-service training on infection control which increased cases of nosocomial infections. Similarly, Angelina et. al, (2021), stated that mechanical ventilation, indwelling catheters, prolonged use of antibiotics resulting in antibiotic resistance, and continuous uptake of histamine receptor blockers due to the overgrowth of potent microorganisms were greatly associated with increased cases of nosocomial infections.

The most common nosocomial infections are respiratory tract infections (RTIs) and the greatest risk factors for acquiring a nosocomial infection are insufficient equipment and lack of infection control guidelines as per Namatovu

Irene, (2014), in her study on factors predisposing health workers to nosocomial infections at Kampala international university teaching hospital.

Restless efforts have been made by health workers to encourage proper hand hygiene, proper instrument sterilization, proper sharps disposal safe waste management, and adequate protective wear, however minimal success has been achieved. If nothing is done, nosocomial infections will continue to prevail among patients and this will result in increased health care costs, prolonged hospital stays, and increased morbidity and mortality. It was upon this background that the researcher was interested in carrying out a study on health facility factors contributing to increased cases of nosocomial infections among patients in the intensive care unit at Jinja Regional Referral Hospital.

Methodology.

Study design and rationale

A cross-sectional descriptive study design was used that employed quantitative data collection methods. Under quantitative, the findings were presented in numerical form such as percentages and frequencies using tables, graphs, and pie-charts. The researcher chose the above methods because they allowed the collection of data at one point in time.

Study setting and rationale

The study was conducted at Jinja Regional Referral Hospital which is a government-owned referral hospital that was first established in the 1930s located in the southeastern part of Uganda and is 82.84km East of Kampala the capital city of Uganda. The hospital provides the whole range of health services except super-specialized ones and serves a population of 4.5 million in a catchment area comprising 1 city that's Jinja city and 11 districts that are to say Bugiri, Bugwen, Buyende, Iganga, Jinja, Kaliro, Kamuli, Luuka, Mayuge, Namayingo, and Namutumba. Some of the services provided include Antenatal care, post-natal care, immunization, dental care, and general consultations and the hospital admits on average 4 patients per week in the intensive care unit. The main economic activity of the residents was small-scale business activities; however, others were involved in office jobs and others in subsistence agriculture. Therefore, the study area was chosen because it provided a sufficient number of respondents who were involved in the study.

Study population

The study population comprised patients who had stayed in the intensive care unit for more than 48 hours at Jinja Regional Referral Hospital. This target population was selected because they were normally prone to nosocomial infections.

Sample size Determination

A sample size of 32 participants was selected which was the representative sample size of a given population of 35 as per Krejcie and Morgan's table of 1970.

Sampling procedure

A simple random sampling method was used to select the required number of respondents where he wrote the words "YES" and "NO" on pieces of paper, placed them in an enclosed box, shook it vigorously then offered potential respondents an opportunity to participate by picking a single paper from the box. Any respondent who picked a paper with the word "YES" written on it was requested to participate in the study. This was continued until the total number of 4 respondents to be interviewed per day was achieved this sampling technique was chosen for this study because it ensured that the sample was representative of the study population and reduced bias in the sample.

Inclusion criteria/exclusion criteria

The study included patients who had spent more than 48 hours in the intensive care unit of Jinja Regional Referral Hospital and who consented to participate in the study.

The excluded were those patients in the intensive care unit who had spent less than 48 hours or more than 48 hours in the ICU and were unwilling or those who declined to participate in the study.

Definition of variables

The study comprised independent and dependent variables. The independent variable was health facility-related factors whereas, the dependent variable was nosocomial infections.

Research instruments

A structured questionnaire was used to collect information from the respondents. The questions were written in the most simplified English that could be understood easily. The questionnaire was divided into three sections according to the study objectives that is, individual, socioeconomic, and health facility-related factors contributing to the increased cases of nosocomial infections among patients in the intensive care unit at Jinja Regional Referral Hospital. This was pre-tested among five patients from the intensive care unit at Bugiri Hospital to determine its accuracy and reliability.

Data collection procedures.

An introductory letter from Kampala University School of Nursing and Health Sciences was presented to the Jinja regional referral hospital who introduced him to the ward in charge of ICU, who introduced him to the respondents. The researcher introduced himself to the respondents and gave a brief explanation of the study. The respondents who agreed

signed the informed consent form and the researcher interviewed the respondents using questionnaires. This improved efficiency and confidentiality during data collection.

Data Management

The data was edited before leaving the study area and ensured that there were no mistakes or areas left blank, and any found were corrected before leaving the study area. The researcher stored the collected data under lock and key and it was only accessible by the researcher.

Data analysis and presentation

The collected data was first analyzed manually by use of pen and paper with tallying, after which the researcher presented the data in tables, graphs, and pie charts generated by Microsoft Excel.

Ethical considerations

Approval was obtained from the research supervisor; permission was sought and granted from the principal of Kampala University School of Nursing and Health Sciences by obtaining an introductory letter. The study only commenced with the researcher introducing and explaining the topic and objectives to respondents and they had to understand and voluntarily consent to participate in the study. The researcher also affirmed to the respondents that the information given was strictly confidential and numbers instead of the respondent's name were used to identify the respondents.

Results.

Table 1: showing demographic data (n=32)

Variable	Category	Frequency (f)	Percentage (%)
Gender	Male	20	63.0
	Female	12	37.0
	Total	32	100
Age group (years)	16 – 25	05	16.0
	26 – 35	08	25.0
	36 – 45	09	28.0
	45 and above	10	31.0
	Total	32	100
Religion	Anglican	07	22.0
	Moslem	05	16.0
	Catholic	12	37.0
	Others	08	25.0
	Total	32	100
Marital status	Single	04	13.0
	Married	14	44.0
	Widowed	08	25.0
	Divorced	06	18.0
	Total	32	100
Level of education	Primary	16	50.0
	Secondary	09	28.0
	Certificate	03	09.0
	Others	04	13.0
	Total	32	100
Nature of occupation	Employed	03	09.0
	Unemployed	18	56.0
	Business	05	16.0
	Others	06	19.0
	Total	32	100

Source: Primary data, (2024).

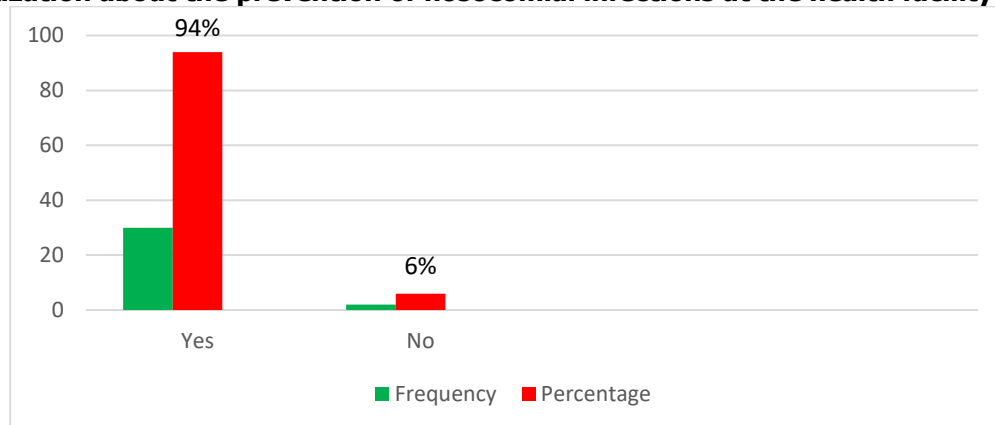
Table 1: shows that, the majority 20(63%) of the respondents were male, while the minority 12(37%) of the respondents were female. According to age, it was revealed that the majority of the respondents 10(31%) were aged 45 years and above, whereas the minority of the respondents 5(16%) were aged between 16-25 years. In addition to religion, it was discovered that the majority of the respondents 12(37%) were Catholics, while the minority of the respondents 5(16%) were Muslims. By marital status, it was found that the majority of the respondents 14(44%)

were married, whereas the minority 4(13%) of the respondents were single.

In regard to educational level, the majority of the respondents 16(50%) went up to the primary level, while the minority of the respondents 3(9%) went up to the certificate level. According to the nature of the occupation, it was discovered that the majority of the respondents 18(56%) were unemployed, whereas the minority of the respondents 3(9%) were employed.

Health facility-related factors contribute to increased cases of nosocomial infections among patients.

Figure 1: Bar graph showing whether respondents had ever had health education or sensitization about the prevention of nosocomial infections at the health facility (n=32)

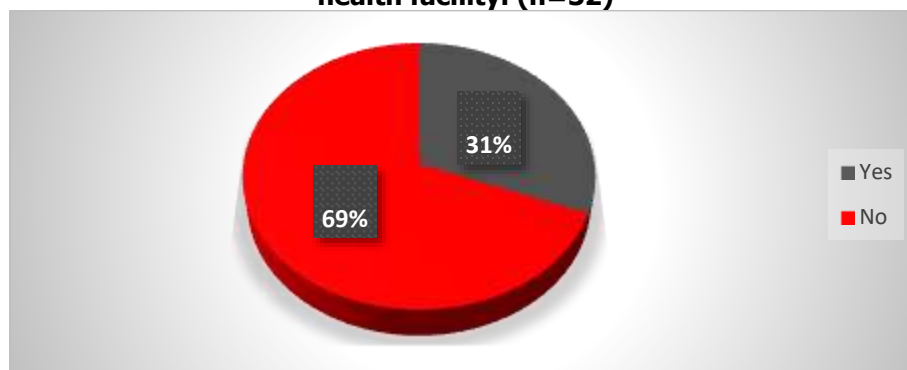


(Source: Primary data, 2024).

Figure 1: shows that, majority 30(94%) of the respondents never had health education or sensitization about nosocomial infections at the health facility, whereas the

minority 2(6%) of the respondents had health education or Sensitization about nosocomial infections at the health facility.

Figure 2: Pie-chart showing whether equipment for infection control is adequate at the health facility. (n=32)

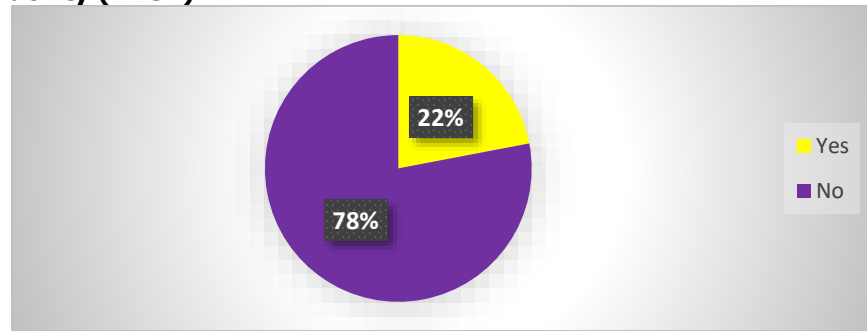


(Source: Primary data, 2024).

Figure 2: shows that the majority 22(69%) of the respondents reported that there was inadequate equipment for infection control at the health facility, whereas the minority of the respondents 10(31%) reported that there was adequate equipment for infection control at the health facility.

Figure 3: Pie-chart showing whether there are adequate health workers to offer treatment at the health facility (n=32)

Page | 5



(Source: Primary data, 2024).

Figure 3: shows that the majority of the respondents 25(78%) reported that there are inadequate health workers to offer treatment at the health facility, while the minority of the respondents 7(22%) reported that there are adequate health workers to offer treatment at the health facility.

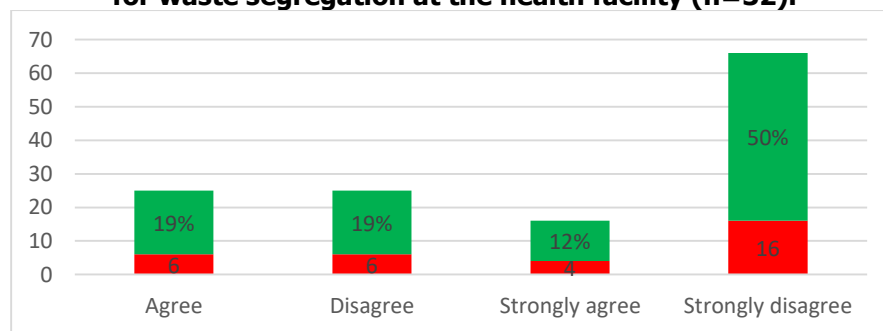
Table 2: Showing whether there are infection control guidelines at the health facility (n=32)

Opinion	Frequency (f)	Percentage (%)
Yes	05	16.0
No	12	38.0
Not sure	09	28.0
Others	06	18.0
Total	32	100

(Source: Primary data, 2024).

Table 2: shows that the majority 12(38%) of the respondents reported that there are no infection control guidelines at the health facility, whereas the minority 5(16%) of the respondents reported that there are infection control guidelines at the health facility.

Figure 4: Bar graph showing respondent's opinions on whether there are enough waste bins for waste segregation at the health facility (n=32).



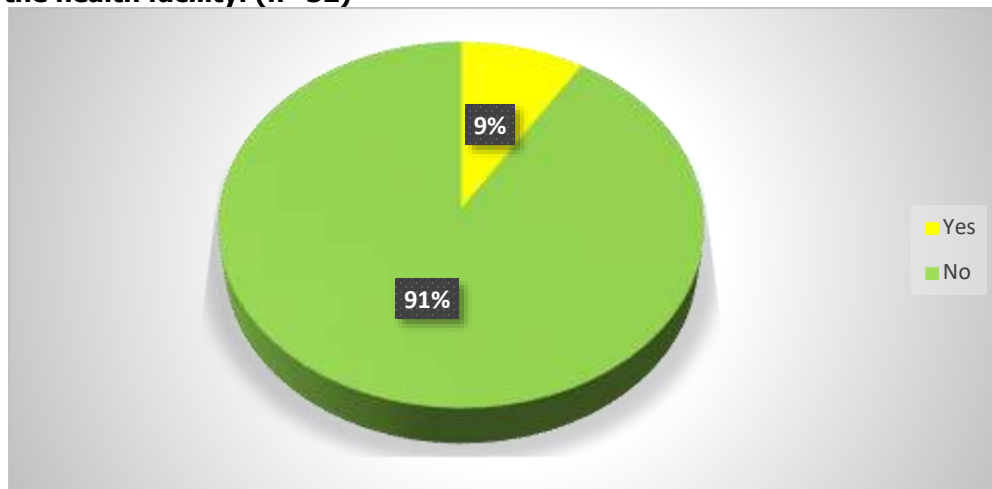
(Source: Primary data, 2024).

Figure 4: shows that the majority of the respondents 16(50%) strongly disagreed that there were inadequate waste bins for waste segregation at the health facility while

the minority of the respondents 4(12%) strongly agreed that there were adequate waste bins for waste segregation at the health facility.

Figure 51: Pie-chart showing whether there is enough hand washing equipment and running water at the health facility. (n=32)

Page | 6



(Source: Primary data, 2024).

Table 5: shows that the majority of the respondents 29(91%) reported that there are inadequate hand washing equipment and running water at the health facility, while the minority

of the respondents 3(9%) reported that there is adequate hand washing equipment and running water at the health facility.

Table 3: Showing respondent's opinions on hospital procedures that predispose to nosocomial infections (n=32).

Opinion	Frequency (f)	Percentage (%)
Mechanical ventilation	11	34.0
Intravenous insertion	07	22.0
Urinary catheterization	08	25.0
All the above	06	19.0
Total	32	100

(Source: Primary data, 2024).

Table 3: shows that the majority 11(34%) of the respondents reported that mechanical ventilation was predisposed to nosocomial infections, while the minority of the respondents reported that mechanical ventilation, intravenous insertion, and urinary catheterization were predisposed to nosocomial infections.

Discussion

Health facility-related factors contribute to increased cases of nosocomial infections among patients.

According to this study, it was found that the majority of the respondents 30(94%) never had health education or sensitization about nosocomial infections at the health facility whereas the minority of the respondents 2(6%) had

health education or sensitization about nosocomial infections at the health facility. This could be because of inadequate knowledge of healthcare providers regarding the prevention of hospital-acquired infections. This was in line with a study conducted in Nigeria by Nwankwo et. al, (2018), where lack of awareness, poor perception, and knowledge of nosocomial infections among healthcare workers predisposed patients to nosocomial infection acquisition.

The majority of the respondents 22(69%) reported that there was inadequate equipment for infection control at the health facility while the minority of the respondents 10(31%) reported that there was adequate equipment for infection control at the health facility. This could be due to limited

resources to allocate enough equipment for infection control at the health facility. The study finding was supported by a study done in Uganda by Wasswa et. al, (2015), which revealed that insufficient infection control supplies in most health facilities were the major reason for not being able to follow precautions against HAIs.

In this study, the majority of the respondents 25(78%) reported that there were inadequate health workers to offer treatment at the health facility whereas the minority of the respondents 7(22%) reported that there were adequate health workers to offer treatment at the health facility. This implied that staff shortage led to poor or no sensitization about nosocomial infections due to the increased workload on the few health workers available. This was in agreement with a study conducted by Rabaan et. al, (2017), in Saudi Arabia where a lack and shortage of medical staff contributed to an increased outbreak of nosocomial infections.

The study findings revealed that the majority of the respondents 12(38%) reported that there are no infection control guidelines at the health facility whereas the minority of the respondents 5(16%) reported that there are infection control guidelines at the health facility. This could be due to poor adherence to universal precautions and inconsistent hospital policy regarding monitoring of hospital infections. This was in line with a study conducted by Xiaohui et. al, (2019), which revealed that the absence of local and national guidelines and policies regarding nosocomial infection prevention and control is associated with increased hospital-acquired infections.

The majority of the respondents 16(50%) strongly disagreed that there are adequate waste bins for waste segregation at the health facility while the minority of the respondents 4(12%) strongly agreed that there are adequate waste bins for waste segregation at the health facility. This implied poor hygienic conditions with cross-infection being common. This was in agreement with a study done by Getachew et. al, (2022), which stated that the absence of waste bins for the segregation of contaminated waste in rooms greatly contributed to increased cases of nosocomial infections.

In this study, the majority of the respondents 29(91%) reported that there are inadequate hand washing equipment and running water at the health facility whereas the minority of the respondents 3(9%) reported that there are adequate hand washing equipment and running water at the health facility. This implied that there were increased chances of cross-infection due to poor hand hygiene practices among patients and health workers. The study findings were supported by a study done by Getachew et. al, (2022), which revealed that the absence of running tap water in a patient's room was greatly associated with the acquisition of nosocomial infections.

The majority of the respondents 11(34%) reported that mechanical ventilation was predisposed to nosocomial infections while the minority of the respondents 6(19%)

reported that mechanical ventilation, intravenous insertion, and urinary catheterization were predisposed to nosocomial infections. This could be because some treatment procedures increase exposure to microorganisms if proper caution isn't undertaken. This was in line with a study conducted by Zewdu et. al, (2023), which found that intravenous insertion, mechanical ventilation /nasal ventilation, and urinary catheterization were associated with nosocomial infections occurrence.

Conclusion

There is a challenge in the implementation of infection prevention and control among patients and health workers due to knowledge gaps thus increasing nosocomial infection outbreaks.

Limitations of the study

Financial constraints since the study did not have any external facilitation.

There was resistance from the respondents because of the sensitivity of the topic.

The challenge of balance between theories and research was met.

Recommendation

Implementation of comprehensive infection control programs and surveillance of infections in hospitals by infection control committee, health education of hospital staff and patients on nosocomial infections to protect themselves from the contaminating microorganisms as well as from spreading pathogenic microorganisms themselves.

Acknowledgment

I wish to express my appreciation to all those who have assisted and supported me in producing this research report. I thank my parents for their endless support, love, care, and guidance throughout my entire life. Special gratitude goes to my brother Mulyanga Raymond, my sisters Nalugo Oliva, Nakasinde Flavia, and Nabumma Lydia, my aunt Miss. Kisawuzi Maria for the financial and social support, encouragement, and motivation throughout the course. May Jehovah God bless them all.

I also extend my special appreciation and thanks to the entire staff of Kampala University School of Nursing and Health Sciences for their support throughout the course, especially Mr. Kibuuka Jacob Usuo for approving my research topic as my supervisor, for the possible corrections and assistance. Finally, I would like to thank the administration of Jinja Regional Referral Hospital for having allowed me to conduct my research in the health facility and all the patients, for their cooperation during data collection. May God reward you all.

List of abbreviations

AIDS:	Acquired Immuno
Deficiency Syndrome	
COVID-19:	Coronavirus Disease
2019	
HALs:	Hospital-Acquired
Infections	
HIV:	Human Immune
Deficiency Virus	
ICU:	Intensive Care Unit
MoH:	Ministry of Health
NI:	Nosocomial Infections
RTIs:	Respiratory Tract
Infections	
WASH:	Water and Sanitation
Hygiene	
WHO:	World Health Organization

Source of funding

The study was not funded.

Conflict of interest

The authors declare no conflicting interest.

Author's biography

Edgar Sserugo is a student of diploma in nursing extension at Kampala University School of Nursing and Health Sciences.

Jacob Usuo Kibuuka is a research supervisor at Kampala University School of Nursing and Health Sciences.

References

1. Angelina Tina Tracy, Elizabeth S., (2021). Effective nursing practices in the prevention of nosocomial infections (hospital-borne infections). JNPR. e-ISSN:2582-9602 <https://doi.org/10.36647/JNPR/01.01.A002>
2. Getachew Melakie, Embialle Mengistie, Tesfaye Ashenafi, Seman Busera, Ejesso Amanuel, (2022). Prevalence of hospital-acquired infections and

associated factors among patients admitted at Hawassa University Comprehensive Specialized Hospital. <https://doi.org/10.21203/rs.3.rs-1399139/v1>

3. Namatovu Irene, (2014). Factors predisposing health workers to nosocomial infections at Kampala International University Teaching Hospital. BMS/0031/71/DU.
4. Manual Haque, Massimo Sartelli, Mckimm Judy, Muhamad Any Baker, (2018). Health care-associated infections -an overview. <https://doi.org/10.2147/IDR.S177247> PMID:30532565 PMCID: PMC6245375
5. Nwankwo E. O, (2018). Epidemiology of healthcare-associated infections in Nigeria: A systematic review and meta-analysis. BMJ. Open. 8(6), e020431(2018).
6. Rabaan A. Ali, Alhani M. Hate, Bazzi M. Ali, Ahmed H. Shamsah, (2017). Questionnaire-based analysis of prevention and control in health care facilities in Saudi Arabia in regards to Middle East respiratory syndrome. <https://doi.org/10.1016/j.jiph.2016.11.008> PMID:28215912 PMCID: PMC7102716
7. Wasswa Peter, Nalwadda K. Christine, Byways Fred, Buregyega Esther & Anguzu Patrick, (2015). Implementation of infection control in health facilities in Arua district, Uganda. <https://doi.org/10.1186/s12879-015-0999-4> PMID:26170127 PMCID: PMC4501062
8. Xiaohui Liu, Zou Ni, Wang Dan, Dan Zhu, (2019). Influencing factors analysis and modeling of hospital-acquired infections in elderly patients. <https://doi.org/10.1007/s10878-017-0222-1>.
9. Zewdu Wasie Taye, Yaregal About Avril, Temesgen Yihunie Akalu, Gershon Mengistu Teases & Bishaw Eden Taye, (2023). Incidence and determinants of nosocomial infections among hospital-admitted adult chronic disease patients in the University of Gondar Comprehensive Specialized Hospital, northwest of Ethiopia, 2016-2020. <https://doi.org/10.3389/fpubh.2023.1087407> PMID:36908459 PMCID: PMC9998944