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Original Article

INDIVIDUAL AND SOCIOECONOMIC FACTORS CONTRIBUTE TO INCREASED CASES OF NOSOCOMIAL INFECTIONS AMONG PATIENTS IN THE INTENSIVE CARE UNIT AT JINJA REGIONAL REFERRAL HOSPITAL. A CROSS-SECTIONAL STUDY.

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Abstract

Background

Nosocomial infections are a major public health problem globally. Despite efforts in hospital infection control measures, they are on the increase and contribute significantly to morbidity and mortality. The study aimed to identify the Individual and Socioeconomic factors contributing to increased 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

The majority 20(63%) of the respondents were male, 10(31%) were aged 45 years and above, 25(78%) had never heard about nosocomial infections, 20(62%) had diabetes that could predispose them to nosocomial infection, 14(44%) of the respondents perceived that a patient on long hospital stay would be most at risk of nosocomial infections, 10(31%) perceived that surgical site infection was the most common type of healthcare-associated infections, 14(44%) of the respondents rated their monthly household income as low.

Conclusion

Implementing infection prevention and control among patients and health workers is challenging due to knowledge gaps that have resulted in increased cases of nosocomial infections.

Recommendation

There is a need for the health facility to encourage periodic review of the microbial flora of their environment and the Antibiotic sensitivity pattern.

Keywords: *Intensive Care Unit, Jinja Regional Referral Hospital, Individual and socio-economic factors, Cases of Nosocomial infection.*
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Background

Globally, healthcare-acquired infections are a typical problem mainly in low socioeconomic countries on World Health Organization (WHO), 2019, healthcare-associated infections (HCAI) fact sheet reported globally 100 million patients were affected by HCAI annually with an estimated 10% of hospitalized patients in developed countries, and 25% in developing countries develop HCAI attributed to inadequate knowledge of health care providers regarding the prevention of HCAI, poor adherence to universal precautions and inaccessibility of personal protective equipment (Sebro et. al, 2023). A study conducted by Raoofi et. al, (2023), revealed that the prevalence rate of HAIs was reported to be 5% in North America and some parts of Europe and 40% in South Asia, Latin American and African countries attributed to poor health standards of the hospital environment, poor personal hygiene of the hospital staff and patients.

In Sub-Saharan Africa, the incidence of nosocomial infections ranges from 2% to 49% with patients in intensive care units having the highest rate ranging from 21.2%-35.6%. In Ethiopia, the incidence and prevalence of nosocomial infections were 35.8% and 16.9% respectively (Zewdu et. al, 2023). Furthermore, another study conducted in Nigeria found that the overall prevalence of nosocomial infections in the country was 20.2% where surgical site infections, urinary tract infections, and bloodstream infections were the most common types of infections reported, this was attributed to poor infection prevention and control practices, insufficient resources, lack of awareness,

poor perception and poor knowledge among health care workers and patients (Olawale et. al, 2023).

In Africa, a higher rate of mortality among in-patients who suffer hospital-acquired infections 22.0% had been reported which were associated with multidrug-resistant pathogens which constituted a burden to patients' clinical and economic outcomes (Usman et. al, 2022). In East Africa, the prevalence of hospital-acquired infections (HAIs) was 60% where Klebsiella spp, staphylococcus aureus, Escherichia coli, and Pseudomonas spp were the common pathogens reported in bloodstream infections, urinary tract infections (catheter-associated), surgical site infection and healthcare-associated pneumonia (Irek et. al, 2018). A study conducted in Kenya by Rohini et. al, (2022), found that the incidence of nosocomial infections ranges from 2.8% to 21.6% with gastrointestinal infections at 53%, bloodstream infections at 21%, lower respiratory tract infections at 11%; The most common hospital-acquired infections were Klebsiella pneumonia and the most common bacteria causing HAI with 61.53% of multidrug resistance strains.

In Uganda, it was found that about 10% of patients undergoing surgical procedures become septic with a high incidence of nosocomial infections consequently increasing the mortality and morbidity of patients, especially in vulnerable populations including pediatrics, pregnant women, surgical patients, and those with chronic illnesses such as HIV/AIDS that lower their immunity and often had frequent visits to the health facilities (Ssekitoleko et. al, 2020). In Jinja Regional Referral Hospital, there were prevalent cases of nosocomial infections, however, the factors contributing to the increased cases of nosocomial infections among patients were not yet clearly known, as no known study had been conducted in the health facility to identify those factors. It was upon this background that the researcher got interested in carrying out a study on individual and socioeconomic factors contributing to increased cases of nosocomial infections among patients.

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 confidentially 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.

Regarding 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.

Table 2: Showing respondents' opinions on which patients would be most at risk of nosocomial infections (n=32)

Opinion	Frequency (f)	Percentage (%)
A patient with a surgical wound	08	25.0
A patient with severe burns	06	18.0
A patient on a long hospital stay	14	44.0
A cardiac patient	04	13.0
Total	**32**	**100**

(Source: Primary data, 2024).

Table 2: shows that the majority 14(44%) of the respondents perceived that a patient on a long hospital stay would be most at risk of nosocomial infections, while the minority 4(13%) of the respondents perceived that a cardiac patient would be most at risk of nosocomial infections.

Table 3: Showing respondents' opinions on the most common types of healthcare-associated infections. (n=32).

Opinion	Frequency (f)	Percentage (%)
Catheter-associated urinary tract infections	09	28.0
Surgical site infection	10	31.0
Ventilator-associated pneumonia	08	25.0
Central line bloodstream infections	05	16.0
Total	**32**	**100**

(Source: Primary data, 2024).

Table 3: shows that the majority of the respondents 10(31%) perceived that surgical site infection was the most common type of healthcare-associated infection, while the minority of the respondents 5(16%) perceived that central line bloodstream infections were the most common type of healthcare-associated infections.

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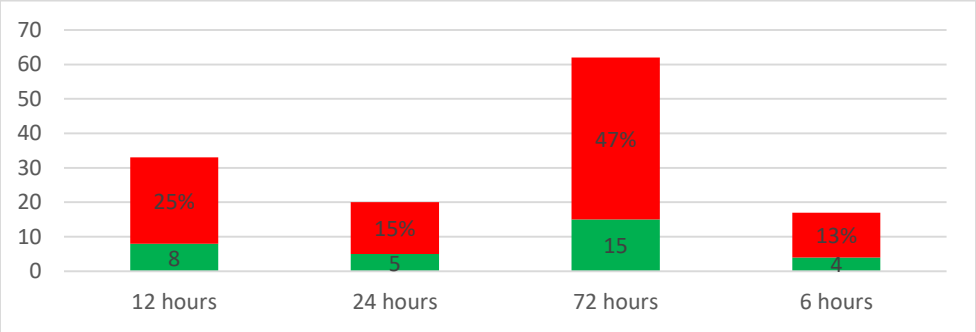
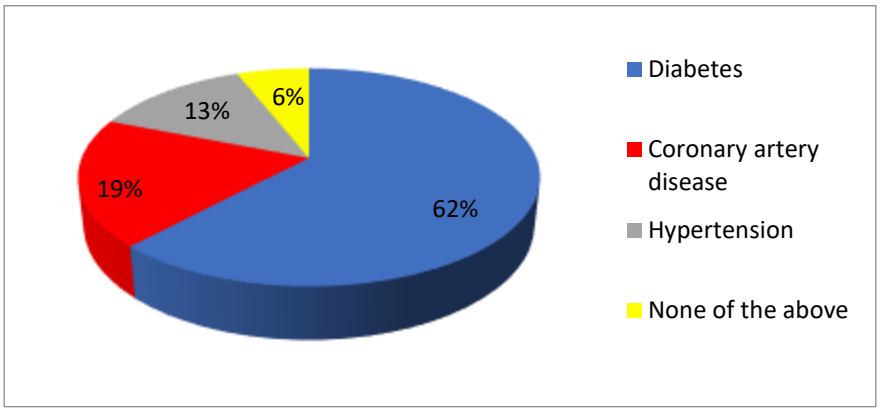
Figure 1: showing respondents' opinion on the minimal time to determine nosocomial infections. (n=32)



(Source: Primary data, 2024).

Figure 2: shows that the majority of the respondents 15(47%) perceived that the minimal time to determine nosocomial infections was 72 hours while the minority of the respondents 4(13%) perceived that the minimal time to determine nosocomial infections was 6 hours.

Figure 2: showing the co-morbid conditions that the respondents had that could predispose them to nosocomial infections. (n=32)



(Source: Primary data, 2024).

Figure 3: shows that the majority of the respondents 20(62%) had diabetes which could predispose them to nosocomial infections whereas the minority of the respondents 2(6%) had coronary artery disease that could predispose them to nosocomial infections

Socioeconomic factors contributing to increased cases of nosocomial infections among patients.

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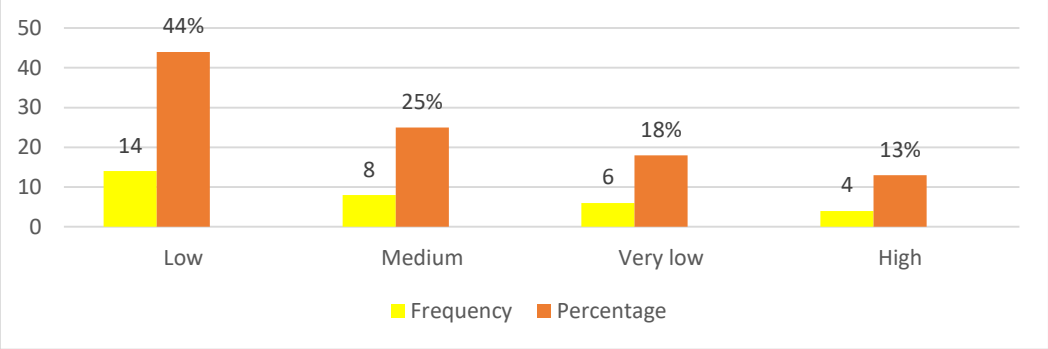
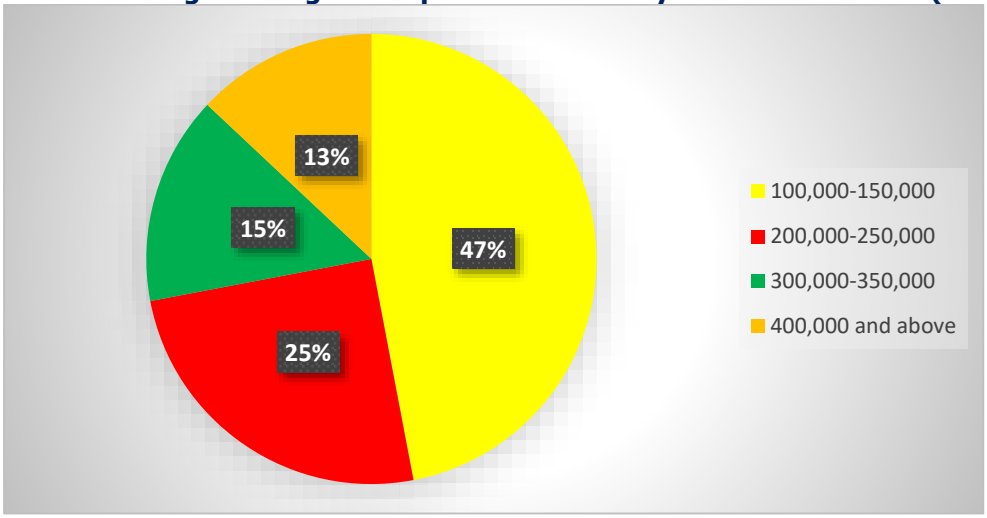
Figure 3: showing respondents' rating of their monthly household income (n=32)



(Source: Primary data, 2024).

Figure 4: shows that the majority 14(44%) of the respondents rated their monthly household income as low, whereas the minority 4(13%) of the respondents rated their monthly household income as high.

Figure 4: showing the range of respondent's monthly household income (n=32)



(Source: Primary data, 2024).

Figure 5: shows that the majority 15(47%) of the respondents' monthly household income was between 100,000-150,000 while the minority 4(13%) of the respondents' monthly household income was 400,000 and above.

Discussion of findings

Individual factors associated with increased cases of nosocomial infections among patients.

The study findings revealed that the majority of the respondents 25(78%) had never heard about nosocomial infections whereas the minority of the respondents 7(22%) had ever heard about nosocomial infections. This could be because awareness about nosocomial infections existence isn't made among patients. In this study, the majority of the respondents 14(44%) perceived that a patient on a long hospital stay would be most at risk of acquiring nosocomial infections whereas the minority of the respondents perceived that a cardiac patient would be most at risk of acquiring nosocomial infections.

This implied that long hospital stay was associated with exposure to different microorganisms within the hospital environment. This finding was supported by a study conducted in Ethiopia by Getachew et. al, (2022), which found that more than five days of hospital stay was associated with the acquisition of nosocomial infections among patients. The majority of the respondents 10(31%) perceived that surgical site infection was the most common type of healthcare-associated infection, while the minority

of the respondents 5(16%) perceived that central line bloodstream infections was the most common type of healthcare-associated l infections. This could be attributed to prior colonization with opportunistic microorganisms. This was in contrast with a study conducted in Uganda by Namatovu, (2014), that found out that the most common nosocomial infection was respiratory tract infections.

The study findings revealed that the majority 15(47%) of the respondents perceived that the minimal time to determine nosocomial infections was 72 hours while the minority 4(13%) of the respondents perceived that the minimal time to determine nosocomial infections was 6 hours. This could be because the longer the hours spent in the hospital environment the more exposure to different disease-causing microorganisms.

According to this study, it was discovered that the majority of the respondents 20(62%) had diabetes which could predispose them to nosocomial infections while the minority of the respondents 2(6%) had coronary artery disease that could predispose them to nosocomial infections. This could be because co-morbid conditions weaken the immune system of a patient and they become susceptible to nosocomial infections. This finding was supported by a study conducted in Africa by Usman et. al, (2022), which found that having diabetes mellitus was the strongest predictor of acquiring nosocomial infections.

Socio-economic factors contributing to increased cases of nosocomial infections among patients.

In this study, the majority 14(44%) of the respondents rated their monthly household income as low, whereas the minority of the respondents 4(13%) rated their monthly household income as high. This implied that the respondents had a low economic status that couldn't support the out-of-pocket health system available leading to overcrowding of public health facilities hence the acquisition of nosocomial infections. This was in line with a study done by Ahmed et. al, (2017), which discovered that poverty and lack of financial support were associated with increased cases of nosocomial infections.

The study findings showed that the majority 15(47%) of the respondents' monthly household income was between 100,000-150,000UGX while the minority 4(13%) of the respondents' monthly household income was 400,000UGX and above. This implied that the respondents with low monthly household incomes couldn't afford the expensive health system available. This was in agreement with a study conducted by Kasim et. al, (2020), which stated that poverty, material deprivation, and overcrowded households increased the rate of nosocomial infections spread.

Conclusion

From the findings in this study, it can be further concluded that resources in terms of human and supplies needed in the implementation of infection prevention and control were reported to be inadequate.

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.

Recommendations

There is a need for the health facility to encourage periodic review of the microbial flora of their environment and the Antibiotic sensitivity pattern.

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 MuIyanga 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.

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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
HCAI: Health Care-Associated Infections
HIV: Human Immune Deficiency Virus
HMIS: Health Management Information System
ICU: Intensive Care Unit
MoH: Ministry of Health
NI: Nosocomial Infections
RTIs: Respiratory Tract Infections
UNMEB: Uganda Nurses and Midwives Examination Board
US: United States
WASH: Water and Sanitation Hygiene
WHO: World Health Organization

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The study was not funded.

Conflict of interest
The authors declare no conflicting interest.

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Edgar Sserugo is a student of diploma in nursing extension at Kampala University School of Nursing and Health Sciences.
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References
1. Ahmed Khan Hassan, Kanwal Big Fatima, Mehboob Riffat, (2017). *Nosocomial infections*: Epidemiology, *prevention, controlandsurveillance*. https://doi.org/10.1016/japjtb.2017.01.019.
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.* Doi: https://doi.Org/10.21203/rs.3.rs-1399139/v1.
3. Kasim Allel, Garcia Patricia, Labarca Jaime, Munita M. Jose, Magdalena Rendic, Grupo Colaborativo de Resistencia Bacteriana, Eduardo A. Undurraga, (2020). *Socioeconomic factors associated with antimicrobial resistance of Pseudomonas aeruginosa, staphylococcus aureus, and Escherichia coli in Chilean hospitals (2008-2017).* Doi:10.26633/RPSP.2020.30.
4. Namatovu Irene, (2014). *Factors predisposing health workers to nosocomial infections at Kampala International University Teaching Hospital*. BMS/0031/71/DU.
5. Olawale One, Edifying Prom, Zainab Lawal, Tolulope Ojo, Tunrayo Oluwadare, To a Bamitale, Boluwaji Jaiyesimi, Akinjisole Alice & Titilayo Apara, (2023). *Knowledge and perception of nosocomial infections among patients in a Nigerian hospital.* https://doi.org/10.21203/rs.3.rs-3164519/v1.
6. Samira Raoofi, Pashazadeh Jan Fatemeh,Raflei Sima,Hosseinipalangi Zahra, Mejareh Noorani Zahra, Saghar Khani & Ahmad Ghashghaee, (2023), Global prevalence of nosocomialinfections:Systematicreviewandmetaanalysis. https://doi.org/10.1371/journal.pone.0274248 PMid:36706112 PMCid: PMC9882897
7. Ssekitoleko T. Robert, Oshabaheehwe Solomon, Tissue S. Martha, Mumbai G. Ian, Reichert M. William, Jojoba L. Moses & Mugaga Julius, (2020). *The role of medical equipment in the spread of nosocomial infections: a cross-sectional study in four tertiary public health facilities in Uganda*. https://doi. org /10.1186/s12889-020-09662-W.
8. Sissy Dogs Sebro, Mengistu Birhanu, Yardarm Sahle, Addis Bill, (2023). *Knowledge and practices towards hospital-acquired infections prevention and associated factors among nurses working at university referral hospitals in southern nations, nationalities and people's region, Ethiopia 2021*. https://doi.org/10.1177/2050312122.
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.

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