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THE KNOWLEDGE AND PRACTICE OF INFECTION CONTROL BY THE STAFF OF ZLITEN MEDICAL CENTER–LIBYA

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Abstract

This study investigated the knowledge and practices of infection control among 104 healthcare workers at Zliten Medical Center in Libya. A cross-sectional survey was conducted using a questionnaire focused on infection control knowledge and practices. The results revealed a concerning lack of adherence to infection control guidelines, particularly regarding the use of personal protective equipment (PPE) and hepatitis B vaccination. Although workers demonstrated good theoretical knowledge, their practical application of these principles was lacking .The study highlighted a negative attitude towards coupled with inadequate PPE use, incomplete HBV vaccination, and a high incidence of sharps injuries. These findings underscore the need for continuous monitoring of adherence to infection control guidelines and the implementation of comprehensive training programs. Crucially, universal vaccination against hepatitis B is recommended to protect healthcare workers. Increased education through training programs, courses, seminars, and workshops is essential to improve infection control knowledge and practices among healthcare workers at Zliten Medical Center.

Keywords: Nosocomial Infection, Infection Prevention and Control (IPC), Infection Disease, non-adherence.

1. INTRODUCTION:

Hospital-acquired infections are a significant cause of illness and death in both developed and developing nations, creating a considerable burden on individuals and healthcare systems. These infections pose serious health risks, particularly for

vulnerable populations, including the elderly and those with compromised immune systems, as well as patients requiring long-term care, such as those in intensive care and burn units.(1)

Infection control is a specialized field, with hand washing being a fundamental practice for healthcare providers before and after patient examinations to prevent the transmission of microbes between doctors and patients, as well as among patients themselves. Hospital-acquired infections occur when a patient contracts an infection during their hospital stay, differentiating them from the initial clinical diagnoses that led to their admission. Effective infection prevention is essential, especially in operating rooms, to ensure the safety of health services.(2, 3)

Globally, the importance of infection control has surged, as it contributes to morbidity, mortality, and increased healthcare costs due to prolonged patient stays. Over the past decade, advancements in healthcare delivery have led to enhanced services and a rise in healthcare personnel.(3)

Healthcare workers face heightened exposure to infectious agents in blood, including hepatitis B, hepatitis C, and HIV/AIDS, which can pose life-threatening risks, although these infections are preventable. The primary mode of transmission in hospitals often involves needle sticks and other sharp instruments.

Surgical site infections can lead to severe complications, resulting in mortality rates as high as 77%.(4)

To mitigate the risk of infection transmission and safeguard both patients and healthcare workers, it is crucial to develop and implement effective infection control plans and strategies. Key components of these programs include the proper use of personal protective equipment (PPE) and vaccination initiatives aimed at reducing exposure and infection risk.(5)

Recognizing the importance of infection control in Libyan hospitals, the National Center for Disease Control has organized training programs for doctors and nurses, providing them with diplomas in infection control practices. The infection control department in hospitals is responsible for implementing appropriate measures and training staff to ensure patient safety and create a secure working environment.(6)

Given the significance of this issue, this study was conducted to evaluate the knowledge and practices of employees at Zliten Medical Center regarding infection

prevention and control methods, as well as their level of commitment to these practices.(5, 7)

Essential for patient safety:

Infection control is an essential component of health care aimed at preventing the spread of infection, especially in hospitals. Hospital-acquired infections are a major concern, leading to increased morbidity, mortality, and health care costs. Vulnerable populations, such as the elderly and immunocompromised patients, are particularly vulnerable, making effective infection control practices vital.(8)

Hand hygiene:

Hand hygiene is one of the most basic infection control measures. Proper hand washing by health care providers before and after patient interaction significantly reduces the transmission of pathogens. This simple practice is essential in breaking the chain of infection, protecting both patients and healthcare workers from harmful microbes.(8, 9)

Use personal protective equipment:

Proper use of personal protective equipment, such as gloves, masks, and gowns, is essential to protect healthcare workers and patients. Personal protective equipment acts as a barrier against infectious agents, especially in high-risk environments such as operating rooms and intensive care units.(10, 11)

Vaccination and education:

Vaccination initiatives for healthcare workers can also reduce the risk of infection. Furthermore, ongoing education and training on infection prevention techniques is essential to keep employees up-to-date on best practices and protocols. This includes training in the proper use of personal protective equipment, hand hygiene, and sharps management. (12, 13)

Global importance:

The global burden of healthcare-associated infections underscores the importance of robust infection control programmers. These infections not only lengthen hospital stays and increase health care costs, but can also lead to serious complications and deaths. Countries are increasingly

recognizing the need for structured infection control training and protocols to enhance patient safety. (14, 15)

2. PROBLEM OF THE STUDY:

- Infection acquired within health facilities is one of the most important health problems, as it has a significant impact on increasing the infection rate, the death rate, and the incidence of infection acquired within health facilities. Therefore, infection control in hospitals and health facilities is considered one of the most important problems that need to be studied.
- The extent to which workers providing health services are exposed to occupational risks, lack of proper practice, and non-compliance with the instructions followed while providing health services in the hospital.

3. OBJECTIVE OF THE STUDY:

1. To assess the level of knowledge regarding infection prevention among healthcare workers at the Zliten medical center.
2. To evaluate the practices of infection prevention and control among healthcare workers at the medical center.
3. To determine the extent of adherence to infection prevention guidelines and practices among healthcare workers.

4. SIGNIFICANCE OF THE STUDY:

This study will contribute to assessing the knowledge and compliance levels regarding personal protective equipment (PPE) use and infection control practices among healthcare workers at Zliten Medical Center. Additionally, the findings

will inform strategies to mitigate the risks of hospital-acquired infections, identify factors responsible for non-compliance, and improve adherence to standard protocols.(16)

5. METHODOLOGY:

5.1. Type and sample of the study

The research was conducted as a descriptive cross-sectional study. The intended sample size included 120 workers from the center, selected randomly. This sample comprised doctors, anesthesia technicians, medical laboratory engineers, nurses, and cleaning staff across different departments at Zliten Medical Center.

5.2. Questionnaire design

A standardized questionnaire was designed to assess the knowledge and practices of medical center employees regarding infection prevention and control measures, as well as their adherence to these protocols. The questionnaire contains 18 questions focused on understanding how to prevent the transmission of infections between healthcare providers and patients, as well as among patients themselves. While the questionnaire covers a wide range of prevention and control methods, it does not encompass every possible control measure.

A total of 120 questionnaires were distributed to the workers, who were asked to complete them. Out of these, 104 employees participated in filling out the questionnaire, while the remaining participants declined to cooperate despite initially agreeing to do so.

5.3. Limitations of the Study

Place of the study: The study was confined to Zliten Medical Center.

Time of the study: Data collection occurred from May 1 to May 20, 2023.

5.4. Statistical Analysis

Descriptive statistical analyses, including counts, percentages, and averages, were employed to interpret the results. These analyses were performed using SPSS statistical software and Microsoft Excel.

5.5. Ethical Considerations

Prior to the distribution of the questionnaire, consent was obtained from each participant in the study sample. Additionally, approval was secured from the administration of the medical center to conduct the research.

6. RESULTS:

Firstly, the study sample comprised 104 workers from various departments of the medical center who agreed to participate. Among these participants, 66 were male (63.4%) and the remaining 38 were female (36.6%).

The participants' ages ranged from 10 to 50 years, with the largest age group being 20 to 30 years, followed by those aged 30 to 40. The smallest group was those under 50.

In terms of professional roles, the sample included 22 medical personnel, 24 medical assistants, 50 nursing and midwifery staff, and 8 cleaning workers, totaling 104 participants. This information is summarized in the following table :

Table 1: Distribution of Employees at Zliten Medical Center

Occupation	Number of Employees	Percentage
Doctor	22	21%
Anesthesia Technician	7	6.7%
Laboratory Engineer	17	16.3%
Nurse	50	48%
Sanitation Worker	8	7.7%
Total	104	100%

The majority of employees at Zliten Medical Center are nurses, comprising 48% of the workforce, which highlights the critical role nursing staff play in patient care. Doctors make up 21%, while laboratory engineers and sanitation workers account for 16.3% and 7.7%, respectively. The presence of anesthesia technicians is relatively low at 6.7%, indicating a smaller specialized team within the medical staff.

Table2: Knowledge of Infection Prevention and Use of Personal Protective Equipment (PPE)

A substantial 77.88% of workers are aware of infection prevention methods, indicating a generally good level of knowledge. However, compliance with PPE usage varies. While 60.57% of workers consistently use gloves, only 34.6% always wear masks, and a mere 5.76% regularly use eyewear. The high percentage of never using eyewear (80.76%) raises concerns about potential

Know how to prevent infection	Yes		NO
	77.88 %		22.11 %
Use of gloves	Always	Sometimes	Never
	60.57 %	37.5 %	1.92 %
Use of masks	Always	Sometimes	Never
	34.6 %	51.92 %	13.46 %
Use of eyewear	Always	Sometimes	Never
	5.76 %	13.46 %	80.76 %

exposure to infectious agents.

Table 3: The principle of medical center staff commitment to using gloves

Principle	Adherence %
Change of gloves between patients.	84.61%
Hand wash between each gloves change.	77%
Removal of gloves/mask while walking around	72%
Removal of watches and jewelry during procedures.	52%

The commitment to glove usage is encouraging, with 84.61% changing gloves between patients and 77% washing their hands after each glove change. However, the 52% adherence to removing watches and jewelry during procedures indicates room for improvement in maintaining optimal hygiene practices.

Table 4: Immunization Status and Willingness to Treat Infected Patients

The staff who got HBV immunization	Yes	No
	%53	47%
Only one dose	25%	
Two doses	%33	
Three doses or more	%42	

While 53% of staff have received HBV immunization, nearly half remain unvaccinated .

Knowledge of Disinfection and Sterilization:

- 85 % of the study group emphasized the importance of disinfecting and sterilizing examination beds and instruments between patients.
- 81 %confirmed the necessity of regularly cleaning and sterilizing floors, walls, and curtains.
- 63.46 % considered disinfection an effective method for cleaning blood and sputum.
- 33.65 % believed that washing immediately with soap and water is an effective cleaning method.
- The high awareness of disinfection practices (85% for examination beds and instruments) suggests a solid foundation for maintaining hygiene standards. However, the lower percentage (33.65%) recognizing immediate washing with

soap and water as effective indicates a gap in understanding best practices for cleaning.

Table 5: Waste Management and Medical Violations

Acknowledge on waste	Agreement	
	Yes	No
Waste is divided into three categories; general, biomedical and pathological	75%	%25
Special container should be used for disposal of each category of waste	%81	%19
Change lab coat when visibly contaminated.	75%	25%

A majority of staff (75%) understand the importance of categorizing waste, and 81% agree on the necessity of using designated containers for disposal.

The 75% agreement on changing lab coats when contaminated reflects awareness of infection control practices, though the 25% who disagreed could indicate a need for further training and enforcement of protocols.

7. DISCUSSION:

It is very important to have an effective infection control program in hospitals. The safety of workers and patients depends on personal protective equipment, vaccination against diseases, cleaning and sterilization so as not to transmit infection between patients or between the patient and the medical staff. Thus, public adherence to measures limits infection within hospitals The public health implications are also presented.

It has been proven that personal protective equipment is the first point of defense to protect both the patient and workers from infection. The Center for Disease Control (CDC) also recommends the use of personal protective equipment (PPE), including: gloves, mask, goggles, and protective clothing.

In this study, 60.57% of workers use gloves , and here the principle of commitment is considered low among workers. Hand hygiene is a mandatory and effective way to reduce transmission of infection. 21.4 % of them wash their hands either before or after wearing gloves. 78.84 % of the sample studied wash their hands before

and after using gloves. In this study, 72% They remove gloves and mask while walking around while working in the hospital.

In this study, 5.76% said Of workers always use protective glasses, 34.6% always using masks, while 24 % Their answer was to agree to treat infected patients. The infection is transmitted through droplets unless you wear eye protection and a face mask. Similar studies have reported a low level of adherence to the use of personal protective equipment . In Canada, it is reported that only 70% of workers use protective equipment (gloves, masks, eye wear). 41% reported using goggles, 93.2% reported using a mask, and nearly 100% of respondents reported wearing permanent gloves .

The results of the current study indicated a very low rate of HBV vaccination, although all participants considered vaccination as an essential tool for HBV prevention. . The percentage of workers who have been vaccinated is 53% . This rate is almost double the rate reported in a study in India. Where only 38% of workers were found to have taken the vaccination. However, other rates much higher than this study have been reported in countries such as Brazil (90.8%) and Canada (100%). In other Arab countries, an almost similar percentage was found in Yemen, where it was 70.1%. In the United Arab Emirates, the percentage was (95.8%).

It is worth noting that a person who is ideally immunized against hepatitis C should receive at least 3 doses at known intervals. And only 42% of the total sample received 3 or more doses. This percentage is very low compared to other results (83.3%). And (64.7%) Among workers in Brazil and the United Arab Emirates, respectively. Full doses should be taken for the HBV vaccine. For all employees before starting work in an environment where there is a possibility of exposure to infection .

Furthermore, 48% of workers reported being infected percutaneous with an unsterile object, a percentage due to the total sample that was not fully immunized against hepatitis C. Percutaneous infection is one of the greatest risk factors for transmission of hepatitis B , C and HIV. Risk prevention can significantly reduce the incidence of hepatitis C among health care workers. For your information, vaccination against this type of virus is provided free of charge in Libya, but it is not mandatory. Therefore, further investigations are necessary to determine the factors that contribute to the ideal immunization level for healthcare workers.

When workers were asked about their willingness to treat patients suffering from infectious diseases, (75.96 %) showed a negative attitude towards treating these patients. In fact, coupled with the workers' lack of commitment to wearing

personal protective equipment and not taking vaccinations ideally, workers often treat patients as if they are an infected person and must take the necessary precautions to prevent infection.

Sterilizing important tools that can be reused after each use is very necessary. Sterilization, dry heat or heat steam and chemical methods to achieve sterilization. In this sample, 68.26 % considered the use of disinfection and sterilization of the examination bed using disinfectants and medical tools using an autoclave among the pathological cases. As an effective method of sterilization. 81.73% of the total sample studied confirmed that the floors, walls, and curtains are cleaned and sterilized regularly.

Considered 63.46 % of the total sample studied used disinfection as an effective means of cleaning blood and sputum accompanied by blood, and 33.65 % considered washing immediately with soap and water an effective means of cleaning. However, 2.88% felt that wiping with a tissue was sufficient.

Approximately 75 % of the total sample members under study agreed that there is a difference in waste (general, medical, pathological) with a similar percentage of 81 % considering waste management and disposal in places designated for each category. (75%) of the total sample studied agreed to change the coat when it is clearly contaminated. The Center for Disease Control (CDC) also recommends that you wear a coat only in the hospital, and change it daily and immediately after blood stains to prevent cross-contamination.

8. CONCLUSION

1. The study showed unsatisfactory results, namely the lack of adherence to the guidelines for correct infection control, especially in the use by personal protective equipment such as gloves, face masks.
2. A large percentage was injured through the skin from a sharp object.
3. A large percentage of workers are less than ideally immunized.
4. Study showed a negative attitude toward treating infected patients, coupled with non-compliance with wearing personal protective equipment, failure to take all HBV vaccination doses, and injury with a sharp object while working.

References:

1. Zenbaba D, Sahiledengle B, Bogale D. Practices of healthcare workers regarding infection prevention in Bale Zone Hospitals, Southeast Ethiopia. Advances in Public Health. 2020;2020(1):4198081.
2. Abalkhail A, Al Imam MH, Elmosaad YM, Jaber MF, Hosis KA, Alhumaydhi FA, et al. Knowledge, attitude and practice of standard infection control precautions among health-care workers in a university hospital in Qassim, Saudi Arabia: a cross-sectional survey. International journal of environmental research and public health. 2021;18(22):11831.
3. Mitchell R, Roth V, Gravel D, Astrakianakis G, Bryce E, Forgie S, et al. Are health care workers protected? An observational study of selection and removal of personal protective equipment in Canadian acute care hospitals. American journal of infection control. 2013;41(3):240-4.
4. Keïta M, Camara AY, Traoré F, Camara ME, Kpanamou A, Camara S, et al. Impact of infection prevention and control training on health facilities during the Ebola virus disease outbreak in Guinea. BMC public health. 2018;18:1-7.
5. Amali OO. Infection prevention knowledge and practices among health care workers at Federal Medical Center Makurdi, Benue State, Nigeria: University of Johannesburg (South Africa); 2022.
6. Jarvis WR. Bennett & Brachman's hospital infections: Lippincott Williams & Wilkins; 2022.
7. Ayed A, Malak MZ, Ayed M, Allayed R, Shouli M. Knowledge, attitudes, and practices toward infection control precautions among nurses in Palestinian hospitals. International Journal of Nursing Education Scholarship. 2024;21(1):20230117.
8. Assefa Y, Gelaw YA, Hill PS, Taye BW, Van Damme W. Community health extension program of Ethiopia, 2003–2018: successes and challenges toward universal coverage for primary healthcare services. Globalization and health. 2019;15:1-11.
9. Adegboye MB, Zakari S, Ahmed BA, Olufemi GH. Knowledge, awareness and practice of infection control by health care workers in the intensive care units of a tertiary hospital in Nigeria. African health sciences. 2018;18(1):72-8.
10. Jarvis WRBBs. hospital infections. Philadelphia: Lippincott Williams & Wilkins.; 2022 2022.
11. Unakal CG, Nathaniel A, Keagan B, Alexandria B, Lauralee B, Varun C, et al. Assessment of knowledge, attitudes, and practices towards infection prevention among healthcare workers in Trinidad and Tobago. International Journal of Community Medicine and Public Health. 2017;4(7):2240-7.
12. Delgado MF. The Impact of COVID-19 in the Innovation of PPE Companies: ISCTE-Instituto Universitario de Lisboa (Portugal); 2021.
13. Adepoju OO, Opeyemi DL. Analyzing Nigeria's PPE Manufacturing Capacity and the Resultant Entrepreneurial Opportunities Due to COVID-19. Entrepreneurship and post-pandemic future: Emerald Publishing Limited; 2022. p. 117-42.
14. Alao M, Durodola A, Ibrahim O, Asinobi O. Assessment of Health Workers' Knowledge, Beliefs, Attitudes, and Use of Personal Protective Equipment for Prevention of COVID-19 Infection in Low-Resource Settings. Advances in Public Health. 2020;2020(1):4619214.
15. Desta M, Ayenew T, Sitotaw N, Tegegne N, Dires M, Getie M. Knowledge, practice and associated factors of infection prevention among healthcare workers in Debre Markos referral hospital, Northwest Ethiopia. BMC health services research. 2018;18:1-10.
16. Salem OA. Knowledge and Practices of Nurses in Infection Prevention and Control within a Tertiary Care Hospital. Annals of Medical and Health Sciences Research. 2019;9.

المعرفة والممارسة لمكافحة العدوى لدى العاملين بمركز زليتن الطبي – ليبيا

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المستخلص:

هدفت هذه الدراسة إلى تقييم معرفة وممارسات مكافحة العدوى لدى 104 من العاملين في مجال الرعاية الصحية في مركز زليتن الطبي في ليبيا. أُجريت دراسة مسحية مقطعية باستخدام استبيان يركز على المعرفة والممارسات المتعلقة بمكافحة العدوى. أظهرت النتائج نقصًا مقلقًا في الالتزام بإرشادات مكافحة العدوى، لا سيما فيما يتعلق باستخدام معدات الحماية الشخصية (PPE) والتطعيم ضد التهاب الكبد (B). وعلى الرغم من امتلاك العاملين لمعرفة نظرية جيدة، إلا أن تطبيقهم العملي لهذه المبادئ كان ضعيفًا. وسلطت الدراسة الضوء على موقف سلبي تجاه استخدام معدات الحماية الشخصية، وعدم اكتمال التطعيم ضد التهاب الكبد (B)، وارتفاع معدل الإصابات بالأدوات الحادة. وتؤكد هذه النتائج على الحاجة إلى المراقبة المستمرة للالتزام بإرشادات مكافحة العدوى وتنفيذ برامج تدريبية شاملة. ومن الضروري التوصية بالتطعيم الشامل ضد التهاب الكبد (B) لحماية العاملين في مجال الرعاية الصحية. كما أن زيادة التثقيف من خلال برامج التدريب والدورات والندوات وورش العمل أمر ضروري لتحسين المعرفة والممارسات المتعلقة بمكافحة العدوى لدى العاملين في مركز زليتن الطبي.

الكلمات الرئيسية: العدوى المكتسبة في المستشفيات، الوقاية من العدوى ومكافحتها، الأمراض المعدية، عدم الالتزام.