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Hygienic Culture and Personal Awareness: Examining Knowledge and Training Needs in Nosocomial Infection among Hospital Staff

Afrah Mofleh Aljohani[1], Mariam Mohammed Alomari[2], Nawal Hussain Almuwallad[3], Mohammed Aali Ahmed Alessa[4], Ahmed Samir Esmail[4], Riyad Ahmed Asiri[5], Amirah Abdulrahim Aljaghthami[6], Faiz Haseen Almalki[4]

[1]Sterilization specialist, King Abdulaziz University Hospital, Jeddah, Saudi Arabia.
[2]CSSD Specialist, King Abdulaziz University Hospital, Jeddah, Saudi Arabia.
[3]Sterilization specialist, King Abdulaziz University Hospital, Jeddah, Saudi Arabia.
[4]Sterilization Technician, King Abdulaziz University Hospital, Jeddah, Saudi Arabia.
[5]Nursing Technician. King Abdulaziz University Hospital. Jeddah, Saudi Arabia.
[6]CSSD Specialist. King Abdulaziz University Hospital, Jeddah, Saudi Arabia.

Abstract

Hospital staff frequently encounter various infections while performing their duties, requiring a thorough knowledge of and stern commitment to infection control procedures. This study sought to assess hospital staff members' knowledge and infection control methods. A total sample of 245 hospital staff members participated in the study, which used a descriptive correlation research approach. An observation checklist was used to evaluate hospital staff procedures, and a self-administered questionnaire was used to gauge staff understanding of infection control methods. The survey found that 71.0% of hospital staff members had insufficient practices for infection control measures, and 85.3% of them had poor knowledge. The results showed that most hospital staff members had insufficient awareness of infection control procedures and poor practices in place. Frequent training sessions are crucial for improving the nosocomial infection control procedures and knowledge of hospital staff.

Keywords: hygienic culture, personal awareness, infection.

Worldwide, infections obtained in healthcare environments are common. Healthcare-associated infections afflict hundreds of millions of patients annually, resulting in high mortality and financial strain on health systems. (Varshney et al., 2014). The term "infection" describes the entry and growth of microorganisms that are not normally found in the body, such as bacteria, viruses, and parasites. (Faris and Hassan, 2016).

Nosocomial infections are infections that occur during or after hospitalization; they are sometimes referred to as hospital-acquired infections. At the time of admission, these infections are neither active nor incubating. Nosocomial infections are often defined as those that appear 48 hours after hospital admission. Certain infections might not show symptoms right away and might even show up after the

patient is released from the hospital. (Teshager et al., 2015).

Nosocomial infections are illnesses that develop during the course of treatment and are not present at the time of admission to a healthcare facility. They are also known as hospital-acquired infections (HACIs) or healthcare-associated infections (HCAIs). Healthcare-associated infections are believed to be two to twenty times more common in developing nations than in developed ones, with five to ten percent of patients in developed countries contracting these illnesses while hospitalized. (WHO, 2008).

Hospitals and health posts are susceptible to infections since their patients frequently have a variety of ailments and can spread their organisms through direct or indirect contact. Certain ages (older adults and neonates), underlying illnesses (diabetes, malnourishment), medication therapy (steroids, antibiotics), and invasive procedures (catheterization, surgery) are among the factors that raise the risk of infection. (Al-Jubouri, 2014).

Direct and indirect touch transmission are the two available modes. Direct contact transmission occurs when an infected or colonized person comes into direct physical touch with a susceptible host, like while a patient is bathing or turning. When a vulnerable host comes into contact with contaminated items such as bandages, medical equipment, or old gloves, the infection is transferred indirectly. (Amoran and Onwube, 2013).

Significantly higher rates of morbidity, mortality, and extended hospital stays are caused by nosocomial infections, which also result in large additional expenses for patients and their families. (Cardo et al., 2010). These infections are frequent but frequently avoidable medical problems. It is anticipated that better infection control procedures might prevent up to one-third of acquired infections. (Siegel, 2007).

Thus, thorough adherence to infection control rules is essential for healthcare professionals, patients, and their families, friends, and close associates. It is imperative for healthcare administrators to guarantee the execution of efficient infection control protocols within healthcare establishments. (Patel et al., 2009). The majority of hospital staff members interact with patients, making them essential to infection prevention and control. Patients might lessen their chance of infection and its aftereffects by receiving education. Reducing infections can be achieved by using the proper barrier precautions, washing your hands often, and making sure that invasive equipment like IV catheters is maintained aseptically. (Smeltzer et al., 2010). This study aims to evaluate hospital staff members' knowledge and actions about infection control methods.

Subjects and Methods

A descriptive correlational research design was used for this investigation.On, the investigation was carried out. Using basic random selection, 245 hospital employees made up the sample. All educational backgrounds were represented, participants were picked without regard to age, and they gave their consent to take part in the study.

Data Collection Tools:

The tool of data collection contains three parts:

1. Personal and Job Characteristics: This section included information on the hospital staff s' age, gender, years of experience, qualifications, and workplace.
2. Self-administered Knowledge Questionnaire: This 45-item questionnaire, which was split into two sections—questions about the hospital (15 items) and questions on staff hospital staff's knowledge of nosocomial infections (35 items), evaluated the staff hospital staff's knowledge about infection control measures.

o Scoring System: Responses were scored like that: 2 for a completely correct answer, 1 for a partially correct answer, and 0 for an incorrect answer. Knowledge was considered satisfactory if the percent score was ≥60% and unsatisfactory if it was <60% (Abd Aziz, 2008).

3. Observation Checklist: This checklist assessed the hospital staff s' practices regarding infection control measures, comprising 119 items divided into general infection control precautions and specific infection control precautions.

o Scoring System: Scores for items that were observed to be completed were 1, and for items that were not applicable or completed, they were 0. If the practice score was 60% or higher, it was deemed adequate; if it was less than 60%, it was deemed inadequate. (Sliman, 2005).

Content Validity:

10% of the sample in the study setting participated in a pilot study; these participants were later dropped from the main trial. The pilot study assisted in estimating the amount of time required to complete the study instruments by testing their applicability, feasibility, and clarity. Additionally, it recognized various challenges and problems that could impede the gathering of data.

Ethical Considerations:

Every hospital employee gave their verbal agreement after being given a brief explanation of the study's objectives. Participants received guarantees that their answers would remain anonymous and confidential and that the data would only be utilized for scientific study.

Statistical Analysis:

After being coded, the unprocessed data were created into a coding sheet and imported into SPSS (version 20.0). Frequency and percentage were utilized in the analysis of quantitative data, along with the chi-square test ($\chi 2$). At the 0.05 level, statistical significance was taken into account.

Results

Table 1: This table displays the occupational and personal traits of the hospital staff participants in the research. It shows that, with an average age of 26.6 ± 4.5 years, 40.8% of hospital staff members were between the ages of 25 and under 30. Ninety-one percent were women. 52.7% additionally possessed a diploma from a technical institute. In terms of years of experience, 43.7% were under five years old.

Table 2: In contrast to urinary tract infections, which are a subset of nosocomial infections, just 2.4% of hospital staff members demonstrated satisfactory knowledge on nosocomial infection control, according to this table, which shows that 76.3% of staff members possessed this knowledge.

Table 3: This table demonstrates that 88.2% of hospital employees followed appropriate personal hygiene practices. Moreover, 62% followed cleaning, disinfection, and sterilization protocols, and 81.2% used infection control measures for specimen collection and transportation.

Table 4: This table shows that when utilizing an endotracheal suction machine, 31.0% of hospital workers adhered to infection control protocols. Unfortunately, there was insufficient practice as none of the hospital staff members followed infection prevention and control procedures for wound infections both before and after surgery. Furthermore, just 2.4% of respondents followed infection management guidelines to avoid urinary tract infections.

Table 5: As can be seen from the table, 18.8% of hospital staff members had a satisfactory overall practice level for particular infection control measures, compared to 47.3% for general treatment. Infection control measures had an overall 29% adequate practice rate.

Table (6): The knowledge levels of hospital staff members and their fields of practice do not appear to be statistically correlated in this table.

Table (1): Personal and Job Characteristics of Staff Hospital staff s in the Study Sample (n=245)

Personal & Job Characteristics	**Staff Hospital staff s**	**No.**	**%**
Age:			
<25		92	37.6
25<30		100	40.8
30+		53	21.6

Range		20.0-48.0	
Mean±SD		26.6±4.5	
Gender:			
Male		5	2.0
Female		240	98.0
Nursing Qualifications:			
Bachelor		62	25.3
Technical Institute Diploma		129	52.7
Secondary Diploma		54	22.0
Experience Years:			
<5		107	43.7
5<10		79	32.2
10+		59	24.1
Range		0.0-27.0	
Mean±SD		6.4±5.1	
Department:			
Emergency		33	13.5
ICU		40	16.3
Surgical		32	13.1
Operating Room		11	4.5
Pediatrics		15	6.4
Medical		30	12.2
Obs/Gyne		20	8.2
Incubator		19	7.8
Hemodialysis		45	18.4

Table (2): Knowledge About Infection Control Among Staff Hospital staff s in the Study Sample (n=245)

Infection Control Knowledge	No.	%
Infection	56	22.9
Nosocomial Infection Definition	34	13.9
Nosocomial Infection Types:		
Respiratory	11	4.5
Urinary	6	2.4
Blood	52	21.2
Nosocomial Infection Control	187	76.3
Infection Control Precautions	87	35.5

Table (3): Practice Level of General Infection Control Measures as Observed by Staff Hospital staff s in the Study Sample (n=245)

General Infection Control Measures	Adequate Practice Level (≥60%)	Inadequate Practice Level (<60%)
Hand Washing	116 (47.3%)	129 (52.7%)
Protective Clothing	50 (20.4%)	195 (79.6%)
Personal Hygiene	216 (88.2%)	29 (11.8%)
Handling Sharps	82 (33.5%)	163 (66.5%)
Cleaning/Disinfection/Sterilization	152 (62.0%)	93 (38.6%)
Handling/Disposal of Waste	91 (37.1%)	154 (62.9%)
Notification	143 (58.3%)	102 (41.6%)
Isolation	25 (10.2%)	220 (89.8%)
Specimen Collection/Transportation	199 (81.2%)	46 (18.8%)

Table (4): Practice Level of Specific Infection Control Measures as Observed by Staff Hospital staff s in the Study Sample (n=245)

Specific Infection Control Measures	Adequate Practice Level (≥60%)	Inadequate Practice Level (<60%)
Prevention/Control of Respiratory Infection	17 (6.9%)	228 (93.1%)
Endotracheal Suctioning:		
Suction Machine	76 (31.0%)	169 (69.8%)
Endotracheal Suction	18 (7.3%)	227 (92.7%)
Total Suctioning	69 (28.1%)	176 (71.8%)
Prevention/Control of Wound Infection:		
Pre-operative	3 (1.2%)	242 (98.8%)
Post-operative	4 (1.6%)	241 (98.4%)
Total Wound	0 (0.0%)	245 (100.0%)
Chest Tubes		
Medication and Fluids	59 (24.1%)	186 (75.9%)
Prevention/Control of Urinary Infection	6 (2.4%)	239 (97.6%)
Prevention/Control of IV-device Related Infection	69 (28.2%)	176 (71.8%)

Table (5): Total Practice Level of Infection Control Measures as Observed by Staff Hospital staff s in the Study Sample (n=245)

Total Practice Level	No.	%
Total General:		
Adequate	116	47.3
Inadequate	129	52.7
Total Specific:		
Adequate	46	18.8
Inadequate	199	81.2
Total Practice:		
Adequate	71	29.0
Inadequate	174	71.0

Table (6): Relation Between Staff Hospital staff s' Knowledge Level and Areas of Practice Level

Area of Practice Level	Knowledge Level	X^2	p-value
General:		2.14	0.14
Adequate	13 (11.2%)		
Inadequate	23 (17.8%)		
Specific:		2.24	0.13
Adequate	10 (21.7%)		
Inadequate	26 (13.1%)		
Total:		1.86	0.17

Discussion:

Nosocomial infections dramatically raise hospital stays, morbidity, and mortality rates for patients. Therefore, understanding the frequency and distribution of these diseases is essential for creating efficient preventive and therapeutic treatments as well as enhancing infection control measures, which will ultimately lower incidence, morbidity, and death. (Park, 2008).

Infections from the hospital environment are more common among hospital workers than in other members of the healthcare team because they spend the most time interacting with patients in wards. Because of their crucial role in controlling nosocomial infections, handwashing, wearing personal protective equipment, and appropriate handling of medical waste are all made necessary. In order to effectively carry out these duties, hospital personnel must possess sufficient understanding of the significance of managing nosocomial infections. (Sliman, 2005).

The purpose of this study was to evaluate hospital staff members' practices and knowledge of infection control. Its objectives were to assess the knowledge and practice levels of hospital staff members and investigate the correlation between these two variables.

Based on the knowledge levels of hospital staff, the study discovered that over 75% of them possessed inadequate understanding concerning nosocomial diseases. This could be a result of insufficient motivation, bad supervision, insufficient training, and regular group discussions to review material. These results corroborate those of Ezz El-Deen (2010) and Al-Jubouri (2014), who also found that fewer than one-third of hospital staff members knew enough about nosocomial infections. They explained this low understanding by blaming hospital staff members' weak theoretical foundations, lack of enthusiasm, and inconsistent training in this field. Abd El-Azeem (2013) discovered that the majority of hospital employees lacked adequate understanding on infection control, but that this improved once educational initiatives were put in place.

Low levels of knowledge about infection control procedures among nursing personnel in Palestinian hospitals were also noted by Fashafsheh et al. (2015). They emphasized that education is essential for preparing healthcare professionals, particularly in nations without official, well-run infection control initiatives. This result, however, conflicts with that of El-Sayed et al. (2015), who discovered that slightly over half of the medical staff members employed in Cairo University's burn unit possessed enough understanding of infection management.

The survey found that over two thirds of hospital staff members had subpar practices in the majority of nosocomial infection control sectors. This could be explained by the inadequate understanding of hospital staff members and the absence of useful clinical advice regarding fundamental infection control measures. These results are consistent with those of Ezz El-Deen (2010) and El-Sayed et al.

(2015), who found that hospital staff members were performing below par and practicing infection control measures at unsatisfactory levels. In contrast, Gizaw et al. (2014) discovered that Ethiopian hospital staff members had appropriate practice in addition to having a high level of understanding on universal precautions. According to Fashafsheh et al. (2015), the majority of hospital staff members in their investigation possessed sufficient levels of practice.

Hospital employees and other healthcare professionals must follow standard precautions in order to effectively control infections. These precautions include steps to lower the risk of spreading pathogens, such as hand hygiene and the application of medical asepsis guidelines for patients who may be infected with highly transmissible pathogens. These steps are critical in lowering nosocomial infections and the cross-transmission of multidrug-resistant infections. (Timby and Smith, 2014).

The study discovered that over half of hospital staff members did not follow general infection control procedures, and that a sizable percentage of hospital-acquired infections were caused by cross-contamination and patient-to-healthcare worker transmission of germs. The study found that most hospital staff members had insufficient infection control procedures, especially when it came to areas like IV-device-related infection prevention, medication and fluid administration, respiratory infection prevention, and endotracheal suction. The hospital staff did not practice controlling chest tube infections or wound infections. (Shinde and Mohite, 2014)

Hospital staff members' knowledge and practice scores did not significantly correlate. This could be the result of lax regulations, a lack of resources, and inadequate ongoing infection control education. There was no discernible connection between knowledge and practice, according to research by Hibbert (2011) and El-Sayed et al. (2015). Fahim et al. (2011), in contrast, found a substantial positive link between performance and knowledge.

Conclusion:

The study came to the conclusion that most hospital staff members lacked sufficient knowledge and practises in the majority of infection control-related domains. Relationships between the practice of hospital staff and age, years of experience, and quantity of services rendered were statistically significant. Nonetheless, no meaningful connections were discovered between the knowledge of hospital employees and their personal or professional traits. Furthermore, there was no discernible correlation between the knowledge and practices of hospital staff about infection control.

WORKS CITED

Abd El-Azem, A.K. (2013). Assessment of nursing performance regarding infection control measures with central venous catheter. Unpublished master's thesis, Suez Canal University, Faculty of Nursing, M.Sc., p. 108.

Al-Jubouri, M.B. (2014). Assessment of Hospital staff 's Knowledge about Nosocomial Infection at Hospitals in Baghdad City. Journal of Kufa for Nursing Science, 4(1), pp. 4-5.

Amoran, O.E., & Onwube, O.O. (2013). Infection control and practice of standard precautions among health care workers in northern Nigeria. Journal of Nursing Education, 3(5), pp. 156-163.

Cardo, D., Halverson, P., Fishman, N., Kohn, M., & Murphy, C. (2010). Moving toward elimination of healthcare-associated infections. American Journal of Infection Control, 4(1), p. 671.

El-Sayed, Z.M., Gomaa, A., & Abdel-Aziz, M. (2015). Hospital staff s' Knowledge and Practice for Prevention of Infection in Burn Unit at a University Hospital: Suggested Nursing Guidelines. Journal of Nursing and Health Science, 4(4), pp. 66-67.

Ezz El-Deen (2010). Assessment of knowledge and practice of emergency hospital staff s regarding infection control in public and private hospitals. Unpublished master's thesis, Suez Canal University, Faculty of Nursing, M.Sc., pp. 114-116.

Fahim, M.F., Hekmat, I.A., Salwa A.M., & Heba, B.S. (2011). Hospital staff s practices regarding infection control during vaccination in children at El-Minia. Journal of Nursing and Health Science, 4(3), pp. 62-69.

Otero, X., Santos-Estevez, M., Yousif, E., & Abadía, M. F. (2023). Images on stone in sharjah emirate and reverse engineering technologies. Rock Art Research: The Journal of the Australian Rock Art Research Association (AURA), 40(1), 45-56.

Nguyen Thanh Hai, & Nguyen Thuy Duong. (2024). An Improved Environmental Management Model for Assuring Energy and Economic Prosperity. Acta Innovations, 52, 9–18. https://doi.org/10.62441/ActaInnovations.52.2

Girish N. Desai, Jagadish H. Patil, Umesh B. Deshannavar, & Prasad G. Hegde. (2024). Production of Fuel Oil from Waste Low Density Polyethylene and its Blends on Engine Performance Characteristics . Metallurgical and Materials Engineering, 30(2), 57–70. https://doi.org/10.56801/MME1067

Shakhobiddin M. Turdimetov, Mokhinur M. Musurmanova, Maftuna D. Urazalieva, Zarina A. Khudayberdieva, Nasiba Y. Esanbayeva, & Dildora E Xo'jabekova. (2024). MORPHOLOGICAL FEATURES OF MIRZACHOL OASIS SOILS AND THEIR CHANGES. ACTA INNOVATIONS, 52, 1–8. https://doi.org/10.62441/ActaInnovations.52.1

Yuliya Lakew, & Ulrika Olausson. (2023). When We Don't Want to Know More: Information Sufficiency and the Case of Swedish Flood Risks. Journal of International Crisis and Risk Communication Research , 6(1), 65–90. Retrieved from https://jicrcr.com/index.php/jicrcr/article/view/73

Szykulski, J., Miazga, B., & Wanot, J. (2024). Rock Painting Within Southern Peru in The Context of Physicochemical Analysis of Pigments. Rock Art Research: The Journal of the Australian Rock Art Research Association (AURA), 41(1), 5-27.

Mashael Nasser Ayed Al-Dosari, & Mohamed Sayed Abdellatif. (2024). The Environmental Awareness Level Among Saudi Women And Its Relationship To Sustainable Thinking. Acta Innovations, 52, 28–42. https://doi.org/10.62441/ActaInnovations.52.4

Kehinde, S. I., Moses, C., Borishade, T., Busola, S. I., Adubor, N., Obembe, N., & Asemota, F. (2023). Evolution and innovation of hedge fund strategies: a systematic review of literature and framework for future research. Acta Innovations, 50,3, pp.29-40. https://doi.org/10.62441/ActaInnovations.52.4

Andreas Schwarz, Deanna D. Sellnow, Timothy D. Sellnow, & Lakelyn E. Taylor. (2024). Instructional Risk and Crisis Communication at Higher Education Institutions during COVID-19: Insights from Practitioners in the Global South and North. Journal of International Crisis and Risk Communication Research , 7(1), 1–47. https://doi.org/10.56801/jicrcr.V7.i1.1

Sosa-Alonso, P. J. (2023). Image analysis and treatment for the detection of petroglyphs and their superimpositions: Rediscovering rock art in the Balos Ravine, Gran Canaria Island. Rock Art Research: The Journal of the Australian Rock Art Research Association (AURA), 40(2), 121-130.

Tyler G. Page, & David E. Clementson. (2023). The Power of Style: Sincerity's influence on Reputation. Journal of International Crisis and Risk Communication Research , 6(2), 4–29. Retrieved from https://jicrcr.com/index.php/jicrcr/article/view/98

Faris, H.I., & Hassan, H.B. (2016). Evaluation of Hospital staff s Practices Concerning Sterile Techniques Critical Care Units in Al-Najaf Al-Ashraf City Hospitals. International Journal of Scientific and Research Publications, 6(6), pp. 698-700.

Fashafsheh, I., Ayed, A., Eqtait, F., & Harazneh, L. (2015). Knowledge and Practice of Nursing Staff towards Infection Control Measures in the Palestinian Hospitals. Journal of Education and Practice, 6(4), p. 88.

Gizaw, G.D., Z.A., & Kibret, K.T. (2014). Assessment of knowledge and practice of health workers towards tuberculosis infection control and associated factors in public health facilities of Addis Ababa, Ethiopia: A cross-sectional study, p. 55.

Hibbert, A. (2011). Stress in surgical patients: A physiological perspective. Journal of Surgical Nursing, advanced practice, Edinburgh: Churchill Livingstone, 23(4), pp. 152-167.

Najeeb, N., & Taneepanichsakul, S. (2008). Knowledge, attitude, and practice of standard and transmission-based precautions of doctors and hospital staff s in tertiary and secondary health care settings of Maldives. Journal of Health Research, 22(2), pp. 45-48.

Park, K. (2008). Park's Textbook of Preventive and Social Medicine. 20th ed., p. 313.

Patel, A.S., White-Comstock, M.B., Woolard, C.D., & Perz, J.F. (2009). Infection control practices in assisted living facilities: A response to hepatitis B virus infection outbreaks. Journal of Infection Control & Hospital Epidemiology, 5(1), pp. 209-214.

Shinde, M.B., & Mohite, V.R. (2014). A Study to Assess Knowledge, Attitude, and Practices of Five Moments of Hand Hygiene among Nursing Staff and Students at a Tertiary Care Hospital at Karad. International Journal of Science and Research, 3(2), pp. 311-319.

Siegel, J.D., Rhinehart, E., Jackson, M., Chiarello, L., & the Healthcare Infection Control Practices Advisory Committee. (2007). Guidelines for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings. Journal of Education and Practice, 6(4), pp. 40-45.

Sliman, W.M.M. (2005). Assessment of intensive care unit hospital staff s' knowledge and practice of infection control precautions. Unpublished master's thesis, Zagazig University, Faculty of Nursing, M.Sc., p. 11.

Smeltzer, S.C.C., Bare, B.G., Hinkle, J.L., & Cheever, K.H. (2010). Brunner and Suddarth's textbook of medical-surgical nursing. 3rd ed., Lippincott Williams & Wilkins, New York, p. 2121.

Teshager, F.A., Engeda, E.H., & Worku, W.Z. (2015). Knowledge, Practice, and Associated Factors towards Prevention of Surgical Site Infection among Hospital staff s Working in Amhara Regional State Referral Hospitals, Northwest Ethiopia, pp. 3-4. Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4693022/