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KNOWLEDGE AND ATTITUDE OF NURSES REGARDING PREVENTION AND CONTROL OF INFECTION IN SHAUKAT KHANUM HOSPITAL, LAHORE

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Abstract

Background: *Nurses are health care professionals whose duty it is to protect patients from acquiring infections while hospitalized or while in a health care set up. By maintaining an infection free environment, the patient's recovery will be promoted, and high-quality nursing care will be delivered. Therefore, they should have a good level of understanding of the knowledge and attitude prevention and control of infection in health care setup. The aim of the study was to determine the knowledge, attitudes and practices of nurses regarding infection prevention and control.*

Objective: *The objectives were to determine The Knowledge and Attitude of nurses in infection prevention and control within a hospital.*

Method: *A quantitative descriptive study was conducted at a Shaukat Khanum hospital in Lahore from January 2026 to April 2026. Sample: A Stratified random sampling was performed. A total of n= 200 nurses of all categories (70% from each category) were recruited in the study. Tools of data collection: a self-developed validated close-ended questionnaire guided by hospital policies, procedure standards, for infection prevention and control, was used to collect data. Data were collected on demographics variables, knowledge and attitude using descriptive statistics. Data analysis was performed by SPSS, including descriptive analysis and chi-square tests.*

Results: *During the main study, n= 200 questionnaires were distributed, n= 200 participants are completed the questionnaires, a response rate of 100. Most of the participants were female; 84.7% (n= 170) while 15.3 % (n= 30) were male. Most participants had good knowledge in infection prevention and control with the mean score of 83.21. The attitude towards infection prevention and control was good with the mean score of 81.37. The practice in infection prevention and control was poor with the mean score of 45.5%.*

Conclusions: *Based on the findings of the current study, it can be concluded that, despite performing well in knowledge and showing a positive attitude towards infection prevention and control, nurses had unsatisfactory practice levels regarding infection prevention and control, exposing the patients to infection-related diseases.*

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INTRODUCTION

Infection-related diseases are still the main cause of death in Pakistan, according to the 2020 health profile acquired by the World Health Organization (WHO, 2020) statistics. The burden of disease in Pakistan includes HIV, TB, Malaria, other infectious diseases and respiratory infections. Expansion of the infection prevention and control movements occur due to the increase in infection occurrences in the country. This increase in infection-related disease's impact the increase health financing in Pakistan with a government contribution to health care of 57.5% above the figures budgeted for (WHO, 2020). Infection prevention and control effects all aspects of health care, including hand hygiene, surgical site infections, injection safety, antimicrobial resistance and how hospitals operate during and outside of emergencies where Health care delivery and medical hygiene standards may be negatively affected by secondary infections. (WHO,2019)

Infectious patients are admitted into hospitals and therefore hospitals have become common settings for transmission of diseases. In hospitals, infected patients are a source of infection transmission to other patients, health care workers and visitors (Sydnor & Perl, 2021). Nosocomial infection, also known as hospital-acquired infections is one of the leading causes of death and has much economic cost due to increased hospitalization and prognosis (WHO, 2021). According to WHO (2010), Hospital acquired infection is defined as an infection occurring in a patient during the process of care within a health care facility which was not present or incubating at the time of admission. These infections are those occurring more than 48 to 72 hours after admission. Due to the admission of patients with different organisms, the hospital environment has become saturated with highly virulent organisms, namely: Staphylococcus aureus, Streptococcus pyogenic, Escherichia coli, Pseudomonas aeruginosa and hepatitis viruses that survive in a hospital. These organisms cause diseases ranging from minor skin infections to life-threatening conditions such as sepsis.

The health care institution should provide a safe environment for the patients in their care. Hospital nurses form the backbone of infection prevention and control, therefore possibly, will either contribute to infection transmission or prevent and control infection. The environment in which a patient is nursed must be planned to reduce the risk of transmission of infection Hengan et al. (2021) Infection prevention and control measures aim to protect the health of patients and hospital staff. Nosocomial infections among health care workers as well as preventive measures against these infections as preventive practices towards nosocomial infections were favourable for hand washing, and unfavourable for self-reporting to the staff clinic when sick. There was no significant ($p>0.05$) association between ever reported or willingness to report nosocomial infections and awareness of hospital policy or the presence of infection control committee in the hospital, Lahore.

By maintaining an infection free environment, the patient's recovery will be promoted, and high-quality nursing care will be delivered. Nurses spend most of their time with patients. Therefore, they should have a good level of understanding of the knowledge, attitudes and practices in infection prevention and control in health care setups.

The objectives are:

- To determine the knowledge of nurses in infection prevention and control in a tertiary care hospital
- To assess the attitude of nurses in infection prevention and control in a tertiary care hospital

1.1 Risk Factors of Infection

Risk factors for infection control failures can be categorized into factors related to the environment, procedure and individual behaviours. These include close contact with infected individuals or materials and contaminated surfaces, certain host factors that increase susceptibility to increase infection and failure to follow established protocols.

- **Inadequate sanitation and hygiene practices:** Poor hand hygiene and lack of environmental cleaning increase transmission.
- **Crowded and poorly ventilated spaces:** These environments facilitate the spread of airborne pathogens.

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- **Close contact with infected individuals or contaminated surfaces:** Direct exposure to infectious materials elevates risk.
- **Use of shared equipment:** Shared medical devices or personal protective equipment (PPE) can be a source of cross-contamination.
- **Inadequate or improper use of PPE:** Improper donning or doffing of PPE, or using the wrong type of PPE, can expose individuals to infection.
- **Lack of or inadequate isolation facilities:** If infected individuals are not properly isolated, the infection can spread more easily.

1.2 Significance

Infection-related diseases are still the main cause of morbidity and mortality in Pakistan. Deaths related to nosocomial infection in the hospital continue to be a health care priority. Nurses with inadequate knowledge, bad practices in infection control and prevention. The WHO has indicated that infection at Shaukat Khanum hospital in Pakistan is a research priority and this coincides with the proposal. Efficient knowledge, good attitude and best practices by the nurse in infection prevention and control may contribute to decreasing in infection rate in the Hospital and it can improve the wellbeing and academic success of nurses leading to better healthcare.

1.3 Problem Statement

A research problem is an area of concern in which there is a gap in the knowledge base needed for nursing practice. The researcher has observed that nurses do not apply infection prevention and control measures in the hospital setting which is required to ensure patient safety. Lack of knowledge, attitude and practices in infection prevention and control contribute to high rates of hospital-acquired infections. Uncontrollable nosocomial infection contributes to prolonged stay, morbidity and mortality which put stress on health care economics of the country (Mishra, Banerjee & Gossan, 2021).

Given the widespread prevalence of infection in Pakistan, and a clear lack of public awareness, this study is carried out to assess the knowledge and attitude regarding prevention and control of infection inside the population. By clarifying these factors, we hope to enable informed interventions and educational campaigns targeted to address problem related to prevention and control of infection and promote proactive management of prevention and control of infection among individuals in Pakistan.

1.4 Research Question

Knowledge and Attitude of Nurses regarding prevention and control of infection in Shaukat Khanum Hospital

1.5 Hypothesis of Research

Null hypothesis (H0): There is significant relationship between nurse's knowledge, attitude related to prevention and control of infection in tertiary care hospital.

Alternative hypothesis (HA): There is no significant relationship between nurse's knowledge, attitude related to prevention and control of infection in tertiary care hospital.

1.6 Objective

The main objective of this study is to assess the knowledge and attitude of nurses regarding prevention and control of infection to determine:

- To evaluate the level of knowledge and attitude of nurses regarding prevention and control of infection.
- To assess the prevention and control of infection (such as use of infection spread products, disposal methods of blood products and syringes, hand hygiene) among nurses in hospital settings.

1.7 Purpose

The purpose of the study is to evaluate the knowledge and attitude of nurses regarding prevention and control of infection.

LITERATURE REVIEW

Clostridium Difficile infection transmission and infection has proven to be difficult to prevent. Some of the patient care activities that provide an opportunity for transmission of CDI include improper oral care procedure.

Procedures such as intubation, patient feeding and administration of drugs coupled with poor hand hygiene and ineffective environmental cleaning provide an opportunity for

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transmission of CDI (Carrizo 2023)

To prevent the spread of the disease early identification of patients who are being investigated for, or diagnosed with CDI is the first step, followed by isolation, use of personal protective equipment, encouraging hand hygiene, ensuring clean environment and use of individual bedside commode for each patient with CDI which cannot be placed into a private room.

Prevention of intestinal colonization of toxigenic strains of CDI can be achieved through restoration of the intestinal microbiota with fecal microbiota transplantation, as well as by colonizing the gut with non-toxigenic CDI strains. Primary prevention is a way of preventing disease as well as injury before it occurs. Preventing hazards leading to injury and disease are examples of primary prevention, it includes education about healthy and safe habits (hand hygiene) and immunization against infectious diseases. In this regard, it indicates that health-care personnel influenza vaccination is important to prevent getting and spreading the infection. Influenza can easily spread from person to person, including from health-care workers to patients. WHO considers universal immunization to be the most effective preventive measure against disease induced by infection with Hepatitis B.

Unsafe injection practices can result in transmission of a wide variety of pathogens, including viruses, bacteria, fungi and parasite. Safe injection practice is a primary intervention for prevention of transmission of infection. Therefore, according to the WHO, a safe injection does not harm both the recipient and the provider and does not harm other people when disposed.

Secondary prevention aims to lessen the bearing of illnesses or injury that has already happened by detecting and treating disease or injury as soon as possible, as well as encouraging personal strategies to prevent re-injury the impact of the disease is reduced (IWH, 2024). Use of personal protective equipment and appropriate ventilation are good examples of secondary infection prevention as well as Isolation of patients with TB, rapid diagnostic evaluation and rapid initiation of treatment. Patients with TB are encouraged to stop smoking and minimize intake of alcohol so as to reduce the impact of the disease.

Transmission of blood-borne viruses and other microbial pathogens to patients during routine health care procedures continues to occur due to unsafe and incorrect injection practice, Infusion and medication vial practices being used by health care professionals (PIDAC, 2021). Assessing knowledge, attitudes and sources of information among Nursing Students towards infection control and standard precautions, results revealed that the overall knowledge scores for nursing students towards infection control and standard precautions were acceptable.

Attitude is the way you think, feel and behave about something, in this case, attitude towards infection prevention and control. Despite the knowledge that dirty hands play a significant role in the spread of health-care related pathogens, and that hand hygiene (HH) decreases the spread of these organisms, health-care worker's adherence with HH is poor.

The risk of cross infection is reduced by appropriate use of and adhering to the WHO 5 moments of hand hygiene. Handling contaminated linen with bare hands pose a risk for nosocomial infection. Contaminated linen is described as infected and should be handled with personal protective equipment. The nurse is negligent if the risk of disease transmission occurs while not wearing protective equipment to stick a needle in the mattress is not an injection safety practice.

To prevent and control of infection in hospital is depend upon the safe and clean environment, knowledge about to prevent and control of infection in hospital environment. Provide knowledge to individuals and nurses about infection prevention and control.

3. RESEARCH METHODOLOGY

3.1 Study Design and setting

A descriptive cross-sectional study was conducted to assess the knowledge and attitude of nurses regarding prevention and control of infection in Shaukat Khanum Hospital Lahore, the second-largest city in Pakistan. Data was collected from student nurses and staff nurses work in the hospital from January to April 2025. The study setting was the clinical environment of a tertiary

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government hospital in Lahore. The clinical environment of the hospital consisted of medical wards, Surgical ward, intensive care, operation theatre, Chemotherapy unit and outpatient department. The study was conducted at Shaukat Khanum Hospital, Lahore.

3.2 Study tool

The study was conducted by using a questionnaire which was self-generated. The questionnaire consisted of open-ended questions and covered the three main areas: the first section consisted of the sociodemographic factors (i.e. as age, occupation, marital status, residence) of the respondents. The second section consist of 7 knowledge-based questions. To assess knowledge of nurses regarding prevention and control of infection the third section consist of attitude towards infection prevention and control among nurses. To assess attitude of nurses regarding prevention and control of infection. The questionnaire included a Likert scale to assess participants' responses to various statements regarding infection control practices. The scale used response options such as 'Agree', 'Disagree', and 'Not Applicable'.

3.3 Sampling technique

Probability random sampling technique was adopted to conduct this study.

3.4 Inclusion criteria

The criteria for the respondents of the study included nurses who were treating infectious cases or student nurses and all categories of nurse's work in Shaukat Khanum Hospital who will meet the inclusion criteria.

3.5 Exclusion criteria

Nurses working in other hospitals were excluded from this study.

3.6 Sampling procedure & 3.7 Sample size

Simple random sampling was used. A sample size of 200 participants was calculated using an appropriate formula incorporating confidence level, margin of error, and estimated proportion.

4. RESULTS

Section 1: Demographical information which included:

The data collection instrument used for this study is comprised of mainly two parts. Data collection tool Independent variable: Attitude and knowledge

- Gender
- Age
- Marital status
- Nursing category
- Years practiced as a nurse
- Employment status
- Number of years in current nursing department

Section 2: Knowledge and Attitude information which included:

This consisted of questions on Knowledge and Attitudes are related to infection prevention and control. The questionnaire consisted of closed-ended questions with a Likert scale of agree (1), disagree (2) and not applicable (3) to choose from. A Likert scale is psychometric response scale used in questionnaires to obtain participants' degree of agreement with set statements.

- The first part of the questionnaire is about knowledge including hospital acquired infections, nosocomial infection, microorganisms and hospital acquired infections guidelines
- Other part is about attitudes of nurses regarding infection control in which questions are about gloves usage policies and procedures for infection control and the workload affects the ability to apply infection.

Statistical analysis:

Data analysis was done using statistical package for the social sciences (SPSS) version 24. Data was entered and analyse on SPSS version 24 using descriptive statistics in which frequency and percentage was reported for nurses to characterize the study population. numerical data was presented through mean and standard deviation. data wass presented in form of tables and graphs (including frequency, percentage, mean and standard deviation) to provide a comprehensive description of the data.

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Demographic results:

Most of the participants were female; 84.7% (n= 170) while 15.3 % (n= 30) were male.

Attitude section results:

- ***Variable 1:*** wearing PPE does not replace the need to carry out safe hand-hygiene practices and hand decontamination. However, the present study shows that n= 6 (3.1%) of nurses still feel that they do not need to wash hands after removing gloves posing a risk to transmission of infection.
- ***Variable 2***: Policies and procedures on infection control should be always adhered to. The majority of nurses n= 188 (96.4%) agreed that they should always adhere to policies and procedures on infection control. A few nurses n= 7 (3.6%) disagreed with the fact that they should always adhere to policies and procedures on infection control. Even though n= 188 (96.4%) agreed that they should adhere to policies and procedures on infection control all the time, the current study shows that n= 103 (53%) indicated that policies and guidelines on infection control are not enough at their hospital.
- ***Variable 3:*** I should attend in-service training/workshop related to infection prevention and control regularly. A good number of nurses n=188 (96.4%) agreed that they should attend in-service training/workshop related to infection prevention and control regularly. However, the current study indicated n= 178 (91.3%) do not attend in-service training/workshop related to infection control regularly.
- ***Variable 4:*** The workload affects my ability to apply infection prevention guidelines. Most of the participants n= 129 (66.2%) agreed that the workload affects their ability to apply infection prevention guidelines, while some participants n= 66 (33.8%) disagreed. Therefore, decreasing exhaustion in nurses is a favourable approach to help control transmission of infection.

6. DISCUSSION

Strengths:

PPE, such as gloves, masks, and gowns, is essential for healthcare workers to protect themselves and patients from infection. The strength of PPE use depends on proper selection, application, and disposal. Regular cleaning and disinfection of surfaces and equipment, especially in healthcare settings, is vital to eliminate pathogens. Prudent use of antibiotics is essential to prevent the development of antimicrobial resistance. Sterilization, particularly for medical instruments, is a critical step in preventing infections, especially in surgical settings. Regular surveillance and monitoring of infections, including tracking outbreaks and antimicrobial resistance, are essential for identifying and addressing potential problems. Vaccination is a powerful tool for preventing infectious diseases, and its impact on reducing the overall burden of infection is well-established. practices like covering coughs and sneezes, and proper disposal of tissues, are important in preventing the spread of respiratory infections. Aseptic technique, which involves maintaining a sterile environment during procedures, is crucial in preventing surgical site infections and other infections related to invasive procedures.

Limitations:

Inadequate supplies like personal protective equipment (PPE), hand hygiene facilities, and cleaning supplies can severely impede IPC efforts. Poorly designed or maintained facilities, inadequate waste management systems, and lack of proper isolation rooms can create opportunities for infection transmission. Shortages of trained healthcare professionals, high staff turnover, and inadequate training on IPC practices can all compromise the effectiveness of infection control programs. Patients may not always adhere to IPC protocols, such as proper hand hygiene or isolation precautions, especially if they lack understanding or perceive them as inconvenient.

There was poor training, unawareness of the importance of standard precautions and inappropriate work conditions (excessive workload and reduced nursing team). The consequences of low adherence to SPs included occupational accidents and sickening of health workers. Although 97% of the participants acknowledged that following the prevention

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guidelines will reduce rates of the hospital-acquired infections, (52.8%) of the participants indicated that infection control policies and guidelines are not enough in the hospital. Recapping of used needles after use and before disposal is not allowed in nursing practice because of the danger of nurses pricking themselves and can be a source of infection. A study to determine the knowledge and practices of infection control among health care workers in a tertiary referral center the study showed that (31.3%) of doctors and (17.3%) of nurse's recap needles after use most of the time hence posing a risk to infection transmission. However, the current study shows that (92.8%) of the participants indicated that needles should not be recapped after use and before disposal, indicating that the participants had a positive attitude towards sharp disposal.

Summary:

Nosocomial infection, also known as hospital-acquired infections is one of the leading causes of death and has much economic cost due to increased hospitalization and prognosis (WHO, 2019). The nurses' knowledge, attitude and practices in infection prevention and control influence the clinical environment which in turn impacts the patient's exposure to infection-related diseases. Nightingale focused on caring for the sick and placed emphasis on the importance of hygiene and patient care in infection prevention and control (Higge,2019 and Gurleer,2020). Infectious patients are admitted into hospitals and therefore hospitals are an ideal setting for transmission of diseases. In hospitals, infectious patients are a source of infection transmission to other patients, health care workers and visitors (Sydnor, & Perl, 2021).

Assessing knowledge, attitudes and sources of information among Nursing Students towards infection control and standard precautions, results revealed that the overall knowledge scores for nursing students towards infection control and standard precautions were acceptable.

CONCLUSION

In a tertiary hospital context, this quantitative descriptive study assessed knowledge and attitude of nurses regarding prevention and control of infection. The results showed that participants' knowledge and attitude were generally acceptable, especially for those who were registered nurses, experienced nurses, and female nurses. The study indicated that the level of knowledge, particularly of the most common HAIs, was not satisfactory and a small percentage of nurses reported that they appropriately perform the disinfection in their working activity. Therefore, Seesaw et al. (2021:148) recommended HAIs control and training programs to address shortfalls and to improve knowledge and adherence to procedures and HAIs prophylaxis and management for patient safety and the reduction of HAIs.

The researcher described how the study was undertaken. It included the topic, described the background and rationale for the study, the problem statement, aim of the study, research objectives, a brief overview of the research methodology and ethical consideration. Despite the nurses being knowledgeable (mean score 83%) and having a p p o s i t i v e attitude (mean score 81%) towards infection prevention and control were very poor (mean score 48.8%). However, if nurses are knowledgeable and have a positive attitude towards infection prevention and control the infection at hospital are expected to be good. As a result of these findings the researcher has concluded that there could be barriers to good control in infection prevention which require further research. In conclusion, the research question "what is the knowledge and attitude of nurses in infection prevention and control within a tertiary hospital in Lahore?" has been adequately addressed in this setting. Therefore, the infection control team should strictly observe nurses as they practice. This includes auditing of hand hygiene practices, observe the nurses as they perform invasive procedures, a procedure that requires aseptic technique, isolation of infectious conditions to prevent the spread of infection and application of barrier nursing. According to (Bennie and Gaffers (2021:207-21), hospitals should compare their own infection rates and find problems concerning specific infection type which should motivate for a careful

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investigation of procedures of care and the alternatives to improve the situation. Therefore, surveillance plans designed according to exact requirements of the hospital are key component of good infection control management in hospitals.

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