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## REVIEW ARTICLE

# EXPLORING KNOWLEDGE AND PRACTICE OF UNDER GRADUATE NURSES STUDENTS REGARD INFECTION CONTROL PRECAUTION IN SHENDI UNIVERSITY 2025

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## ABSTRACT

Infection prevention and control is the refinement interested in promoting health care setting from occurrence of infection rather than academic areas of epidemiology. Infection prevention and control are expanded from healthcare into a component in public health, known as "infection protection". This study aimed to explore the knowledge, attitude, and practice (KAP) of Infection control precautions among under graduate Nurses students .Descriptive cross sectional community based study constructed was utilized on line via google form, conducted using a structured questionnaire(36) regard knowledge attitude and practice about infection control sent through google form to participants . 30 students engaged in the study. Researcher scored (>80-70%% ) as good and poor for all knowledge, attitude and practice <70% for poor, descriptive statistics done using frequency and percent and Mean, SD and for correlation chi squire done considering considered for knowledge, attitude and practice is p .000value 0.5 as significant correlation **Results:** were 20(66.7%) , 22(73.3%) and 26(86.7%) respectively**.** From the results we found a strong relation between knowledge, attitude and practice with their knowledge, attitude and practice p value . .000**.** which is considered as significantly correlation**. Conclusion**: Participants showed good knowledge attitude and practice regard Infection Control Precaution



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# INTRODUCTION

Infection prevention and control is the refinement interested in promoting health care setting from occurrence of infection rather than academic areas of epidemiology .Infection prevention and control are travel from healthcare into all ingredients of public health, known as "infection protection" (WHO,2020). It is an essential part of the infrastructure of health care. Infection control focuses on elements related to the transmission of infections within the healthcare setting, between patients, patients to staff, and from staff to patients vice versa, or among staff themselves. Which contain hand washing, cleaning, disinfecting, sterilizing, and vaccinating, besides observation, control, and examining and managing doubtful outbreaks of infection within a healthcare setting (WHO, 2015). When infected patient admitted to hospital he exposed all hospital setting for infection, health care workers and patients and visitors there he considered as a source of infection (Sydnor & Perl, 2011). Other types of infection, infection which acquired during admission in hospital known as nosocomial infection, also known as hospital-acquired infections which are considered as leading causes of death and patients stay long time in hospital which increase the cost and become a burden for the country (WHO, 2015). As WHO (2010)report, Hospital acquired infection is defined as an infection occurring in a patient during admission and receiving his care in a health care setting which was not present These infections are activated more than 48 to 72 hours after admission and within ten days after hospital discharge (Collins, 2008). These patients admitted with distinct organisms, their hospital setting has become appeased with highly malignant organisms, namely: Staphylococcus aureus, Streptococcus pyogenic, Escherichia coli, Pseudomonas aeruginosa and Hepatitis viruses that survive in a hospital. These organisms cause

diseases extended from minor skin infections to very serious conditions such as sepsis (Sydnor and Perl, 2011). Morbidity and mortality like Ventilator-associated pneumonia (VAP), which occurred when patient is admitted in ICU, with a mean incidence increasing more than 30%. It has recently been suggested as a point of quality of care, although efforts to decrease its occurrence may sometimes be misdirected if it does not contribute to mortality in the ICU in certain populations. So many studies have trial to quantify that considered fatal as mortality of ventilator associated pneumonia (VAP), subjecting respects ranging from 0–60% in critically ill patients (Melsen *et al*., 2013) developed a new approach, labeled "patient data meta-analysis," in which raw data from prospectively obtained, published trials of means for preventing VAP was used to estimate the relative risk reduction (RRR) for mortality in VAP. This eliminated confounding cluster effects for which adjustment had been made, and allowed sensitivity analysis to assess the effect of VAP. Mortality attributable to VAP was found to be 13%; however, this varied greatly for different subgroups, being 69% in surgical patients and 36% in those with illness of intermediate severity. Instead, a longer ICU stay, with possibly increased rates of nosocomial infections and complications secondary to invasive procedures, was found to contribute to mortality. The use of tactics for preventing VAP did not seem to affect overall mortality (Hranjec, and Sawyer, 2014(

**Significance of the Study:** Health care-associated infections (HAI) are considered as major public health problems because they occur frequently, cause morbidity and mortality and perform a significant encumbrance among patients, health-care workers and health systems. HAI occurs worldwide and affects all countries, whether of their degree of development, Outbreaks of HAI may have severe consequences in hospitals and transmission from former patients, visitors and staff may also extend to community, (Lemesse, 2014). Health care-associated infections (HAIs) are the most common elaboration of hospital care (Scott RD, 2009). However, new studies recommend that implementing existing prevention practices can lead to up to a 70 percent reduction in certain HAIs. The financial benefit of using these prevention practices is estimated to be $25.0 billion to $31.5 billion in medical cost savings (Vincent, 2009).

Nurses' students are exposed to different types of infectious diseases during their training in the clinical area in the health care setting and during their emergency care. Hospital-based personnel and personnel who provide health care outside hospitals may acquire infections from or transmit infections to patients, other personnel, household members, or other community contacts (Sepkowitz,1996) therefore this study aimed to assess undergraduate nursing students regarding infection control and precaution.

**Nurses Role:** All graduate nurses must know the rules of infection control and its precaution before joining the work. The pertinent studies disputed, a basic conception of the CDC Infection Control Guidelines must be attained. There are four major infection control guidelines outlined by the CDC. These include Disinfection and Sterilization, Environment Infection Control, Hand Hygiene, and Isolation Precautions (Centers for Disease Control, 2017). It is the nurse's responsibility to be familiar with and to maintain compliance with all four of these sections.

The Disinfection and Sterilization guideline dictates the appropriate methods of cleaning various multiuse items used by nurses (Centers for Disease Control, 2008). Many infection control measures, such as appropriate hand hygiene and the correct application of basic precautions during invasive procedures are simple and of low-cost, but require staff accountability and behavioral change, in addition to improving staff education, reporting and surveillance systems (Boujaafar, 2013). In addition to the administrative controls, we have identified areas where nurses can make immediate positive change in infection control practices. To utilize these precautions, the human element plays an important role in increasing or decreasing the chances of catching HCAI (Cole, 2007). Therefore, adequate nursing staff is necessary because a higher patient-to nurse ratio increases the risk of nosocomial infection.

Full training program
Using personal protective device
Followed surgical procedure process

**Aims**

To assess knowledge and practice of under graduate Nurses students Regard Infection Control Precaution In Shendi university 2025

Research questions:
what is level knowledge of under graduate nurses students regard infection control
what is level practice of under graduate nurses students regard infection control
Subjects and methods:

**Research design:** This cross-sectional descriptive research design was utilized.

**Study setting:** The current study was carried out in Shendi university, which was selected using simple random sampling technique as follow;

**Stage 1: Selection of district**

The study was conducted at Shendi University faculty of nursing which is a public university that was established in 1994, located in Shendi, Sudan. It is a member of the Federation of the Universities of the Islamic World. The Faculty of Medicine and Health Sciences at Shendi University offers a wide range of undergraduate and postgraduate programs in various fields of medicine, dentistry, nursing, pharmacy, public health, and other health sciences disciplines.

**Stage 2:** Selection of study area:

The researcher selected Shendi University faculty of nursing. The only university located in shendi city.

**Stage 3:** Selection of participants

Finally, the researcher selected participants by the simple random sampling method. For those who accepted to participate in the study were included in the study sample till reaching the calculated sample size.

**Study subjects:** A sample of 30 under graduate nurses students selected based on the following inclusion criteria;

Class tow, three and four

Accept to participate in the study (oral consent).

**Exclusion criteria**

Class one

Class two, three and four who refused to participate in the study

**Data processing tools:** Data were collected by questionnaire contains (37) questions which are composed of three sections: Knowledge, evaluation and practice all data collected through what's

The questionnaire with three sections was used to collect data;

**Part I:** Demographic data: It was utilized to assess the socio-demographic characteristics of the elderly. It entails data about elderly's age, sex, level of educational, if they received additional training course regard infection control

**Part II:** knowledge about hospital infection. It contains (12) question to assess under graduate nurses students' knowledge about hospital infection changes as follow; Knowledge of hospital infections, Standard precautions are used for the care of all patients regardless of their diagnosis and perceived infection status solation precaution is one of the elements in standard precaution it happen after 48 hours after admonition who transmit hospital infection.

**Attitude about** hospital infection this part consists of (12) about Standard precaution is not easy to follow.

Infectious diseases, beliefs about hand hygiene before and after doing any procedure for patients, nurses must use PPE and during emergencies. When changing gloves, availability of adequate protective barriers. If telephones, and doorknobs are sources of infections or not, when to put them. Segregation of clinical and non-clinical waste to prevent transmission of infections from one to another.

**About practice** regard infection control consist of (13) about when to make hand hygiene, when to wear glove, and when to wears mask when to wear PPE

**Data analysis:** All information collected was coded, scanned , processed and analyzed by SPSS Version26.0.0 and using excel data interpreted in terms of tables using descriptive analysis frequency and percent Mean and SD. For correlation we use chi squire to find the relation between social data and their knowledge attitude and practice considered p value .05 as significant.

**Ethical consideration:** Due to the Sudan war conflict data collected through google form and verbal consent was obtained from participants.

# RESULTS

**Table (3-1) Distribution participants' demographic characteristic: (n=30)**

| variable | Frequency | Percent (%) |
|---|---|---|
| 1.Age by years | | |
| 18-22 | 23 | 57% |
| More than 22 | 7 | 23% |
| More than 29 | 14 | 47% |
| 2.Level of education | | |
| Class tow | MSc | MSc |
| Class three | Bachelor | Bachelor |
| Class four | | |
| 3.Gender | | |
| Male | 8 | 26.6 |
| Female | 22 | 73.3 |

**Table 2. Knowledge of participants about hospital infection (n=30)**

| Items | yes | No | Not sure |
|---|---|---|---|
| Do you know hospital infections | 22(73.3%) | 8(26.6%) | 0 |
| Standard precautions are used for the care of all patients regardless of their diagnosis and perceived infection status | 30(100%) | 0 | 0 |
| solation precaution is one of the elements in standard precaution | 25(83.3% | 3(10%) | 2(6.6%) |
| it happen after 48 hours after administration | 13(42%) | 10(33%) | 7(23.3%) |
| hospital infection transmitted can be from | | | |
| Patient from health facility | 20(66.6%) | 2(6.6%) | 8(26.6%) |
| Doctor to patient | 14(46.4%) | 15(50%) | 1(3.6%) |
| Patient to visitor | 20(66.6%) | 8(26.6%) | 2(6.6%) |
| Nurse to patient | 22(73.3%) | 8(26.6%) | 2(6.6%) |
| Have you receive additional training in infection control beside your education course | 14(46.6%) | 16(53.4%) | 0 |
| Is there periodic follow up infection control in the hospital | 18(59.3%) | 12(40.7%) | 0 |
| Are there laws for implement infection control measure | 18(59.3%) | 12(40.7%) | 0 |
| Are there detailed forms for immediate reporting of hospital infections | 20(66.6%) | 0 | 10(33.3%) |
| Mean knowledge | Frequency | | Percent (%) |
| Good knowledge 80-70 % | 20 | | 66.7% |

**Table 3. Attitude of participants about hospital infection (n=30)**

| **Item** | **agree** | **Disagree** | **neutral** |
|---|---|---|---|
| Standard precaution is not easy to follow | 0 | 23(76.6%) | 23.3%) |
| Infectious diseases can be treated hence PPE are not required | 3(10%) | 23(76.6%) | 4(13.3%) |
| Prefers to perform hand hygiene before and after any intervention with patients | 30(100%) | 0 | 0 |
| PPE can be used during emergencies | 30(100%) | 0 | 0 |
| Changing gloves is not necessary during procedures even if heavily contaminated | 10(33.3%) | 20(66.7%) | 0 |
| is difficult to work wearing PPE | 5(16.7%) | 25(83.3%) | 0 |
| Nurse students should ensure the availability of adequate protective barriers | 27(90%) | 3(10%) | 0 |
| Nurse student should not use PPE because it may harm patients psychologically | 0 | 30(100%) | 0 |
| Stationeries, telephones, and doorknobs are not sources of infections | 27(90%) | 3(10%) | 0 |
| Segregation of clinical and non-clinical waste is useful to prevent transmission of infections from one to another | 23(76.7%) | 0 | 723.3% |
| Adequate disinfection of medical equipment should be ensured for students by college | 27(90%) | 0 | 3(10%) |
| Transmission of infectious organisms can be reduced by adhering to standard and contact precautions | 30(100%) | 0 | 0 |
| It is not logical to assume all patients contagious unless their infection has been confirmed | 13(43.3%) | 0 | 17(56.7%) |
| **Mean attitude level** | **frequency** | | **percent** |
| Good practice 80-70 % | 22 | | 73.3% |
| Poor practice less than 70% | 8 | | 26.6% |

**Table (4). Practice of participants about hospital infection (n=30)**

| **Item** | **always** | **sometimes** | **never** |
|---|---|---|---|
| Always performs hand hygiene when they coming contact with patients. | 30(100) | 0 | 0 |
| performs hand hygiene after taking off gloves | 25(83.3%) | 5(16.7%) | 0 |
| Washes hands immediately after contacting any blood, body fluid, secretion, excretion, or dirty substances. | 30(100%) | 0 | 0 |
| Wear gloves when drawing blood samples. | 27(90%) | 3(10%) | 0 |
| wears gloves when disposing of stool or urine | 25(83.3%) | 5(16.7%) | 0 |
| Wear gloves when handling impaired patient skin. | 29(96.7%) | 1(3.3%) | 0 |
| Wear gloves when handling the patient's mucosa | 29(96.7%) | 1(3.3%) | 0 |
| Wear gloves when handling saliva or sputum culture. | 27(90%) | 3(10%) | 0 |
| Wear gloves when performing parenteral injections of medications. | 27(90%) | 3(10%) | 0 |
| Wear gloves when dressing wounds. | 30(100%) | 0 | 0 |
| Wear gloves when they come in contact with blood. | 30(100%) | 0 | 0 |
| Wear mask when performing procedures that might induce the spraying of blood, body fluid, secretions, or excretions. | 30(100%) | 0 | 0 |
| Wear a protective eye patch or goggle when performing operations/procedures that might induce spraying of blood, body fluid, secretions, or excretions | 20(66.7%) | 10(33.3%) | 0 |
| **Mean practice** | **frequency** | | **percent** |
| Good practice 80-70 % | 26 | | (86.7%) |
| Poor practice less than 70% | 4 | | 13.3%) |

**Table 4. Mean, SD and p value for participants knowledge, attitude and practice**

| **item** | **Mean** | **SD** | **P value** |
|---|---|---|---|
| **knowledge** | 1.4844 | .18406 | .000 |
| **attitude** | 3.6413 | .60403 | .000 |
| **practice** | 1.2810 | .15992 | .000 |

**Table 5. Correlation of socio demographic and their knowledge, attitude and practice**

| items | Demographic data | P *value* |
|---|---|---|
| **knowledge** | Age | .000 |
| | Gender | .01 |
| | Education level | .000 |
| | Attending course about infection control | .000 |
| **attitude** | Age | .000 |
| | Gender | .000 |
| | Education level | .000 |
| | Attending course about infection control | .000 |
| **Practice** | Age | .000 |
| | Gender | .000 |
| | Education level | .000 |
| | Attending course about infection control | .000 |

# DISCUSSION

Knowledge and training in standard precautions, high risk conception and longer duration of professional experience have been shown to be correlating with improved submission with standard precautions among health workers and also is cornerstone for nurses students to prevent infection (Kermode *et al*., 2005; Luo *et al*., 2010) .Our participants showed good knowledge regard infection prevention which disagree with study done in Northern Nigeria ,about half of their respondents have fair knowledge of infection control. (Abdulraheem *et al*., 2012). On another hand our findings showed similarity with study done in Qassim Medical City University where their participants showed good knowledge (80.0%) (Balkhail,et al.(2021). Again our participants had better knowledge than (Johnson *et al*., 2013; . Vaz *et al*., 2010). Regard attitude finding concerned attitude, our participants showed good positive attitude this Which similarity studies conducted in Jordon(Darawad *et al*. (2013) , (Sarani, *et al*. (2014), also our finding similar to study done in Aba (Al-Ahmari, *et al*., 2021) and Ethiopia (64.2%) Yazie *et al*. (2019). Regarding practice, our participants reported good practice toward infection control. Concerning assessment of nurses' practice regarding infection controls, the current study demonstrates that the majority of the studied sample had a good practice level of infection control. Practice was found to be similar (Agaral and Thomas, 2003; Talaat and Shamia, 2010). Again our finding showed similarity with (Fashafsheh *et al*., 2015). The study reported a significant relationship between knowledge or practice regarding infection control which came in the same line with study done in Palestinian (Fashafsheh *et al*., 2015). While in different with, Gijare, (2012) reported no significant statistical difference in pre and post test knowledge and practice scores of various age groups and different years of experience.

## CONCLUSION AND RECOMMENDATION

To possess satisfied knowledge, attitude, and practice of infection control standard precautions are vital to prohibit spread of infections. Researchers from results found good knowledge, attitude and practice of participants and suggest that annual training programs related to infection control in order to update and intensify the role of nurses in infection control.

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