



Research Article

Level of implementation of infection control at Tobruk Medical Center, basis for infection control program enhancement

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Abstract

Infection control has a strong commitment and with clear responsibilities for effective implementation of standard infection control procedure, including handwashing/hand hygiene, disinfection/sterilization, personal protective equipment, and waste management. The aim of the study is to determine the level of implementation of infection control among nursing staff in the special area and different wards of Tobruk Medical Center in order to generate information regarding infectious disease that can be prevented from spreading through contamination from nursing staff to patient, patient to family, health care provider to family, and The need to understand infection prevention practice is important for prevention and control of nosocomial infection. This study revealed that male (3.31) nurses implement infection control at a higher level than female (3.05) nurses do. The graduates of Bachelor of Science in nursing (3.22) implement infection control at a higher degree than the Nursing Diploma graduates (3.13), it also revealed that hand hygiene/ handwashing (1.75) and waste disposal (2.61) had relatively lower mean score in Medical ward, therefore there is a need to enhance the infection control activities in these two areas. However, there are no significant differences on the level of implementation of infection control program when Nurses are grouped according to their profile. To sustain good practices, adequate pre-service and in-service training should be in place to equip and update health care workers specially nurses about infection prevention precautions. The need for continuous supervision should be implemented to strengthen adherence for infection prevention practices among Health workers along with sustainable and reliable supply.

Keywords: Level of implementation, Infection control, Hand hygiene, Medical equipment, Proper disposal, Practice, Nosocomial infection.

INTRODUCTION

Wise and Humane management of the patient is the best safeguard against infection (Nightingale, 1980). Infection control refers to policies and procedure used to minimize the risk of spreading infections. The general principles of infection control are applied during working practices which protect other service users and staff from infection. If the patient is cold, if a patient is feverish, if a patient is faint, if he is sick after taking food, if he has a bed sore, it's a generally the fault not of the disease, but of the nursing (Nightingale, 1990).

All blood and body fluids are capable of transmitting infection therefore universal precautions are applied to all service users in all wards/department/community and at all times. Selection of personal protective equipment (PPE) must be based on assessment of the risk contamination of the care practitioner's clothing and skin by a service user's blood, secretions or excretions (HSC, 1998). Everyone involved in providing care specifically nurses should be educated about standard principles and trained in the use of protective equipment. Adequate supplies of disposable plastic aprons, single use gloves, face mask and goggles must be made available wherever care is being delivered.

Involving the infection prevention and control team in the planning process for new construction and Ensuring the implementation of effective national campaigns and innovations, e.g. WHO five moments for hand hygiene (Sax, 2007).

Infection contracted in hospital is also called nosocomial infection. They occur in approximately 5% of all hospital patients (WHO 2009) These infections result in increased time spend in the hospital and in some cases death. There are many reasons nosocomial infections are common, one of the which is that many hospital patients have weakened immune system which makes them more susceptible to infections. This weakened immune system can be caused either by the patient's disease or by treatments given to the patients. Second many medical procedures can increase the risk of infection by introducing infectious disease. In 2011, the World Health Organization (WHO) reported that on average 7% of patients in developed and 15% in low- and middle-income countries (LMICs) suffer from at least one HAI at any given time, with attributable mortality estimated at 10%.

An inclusive term of any professional that works to prevent the spread of infection regardless of primary discipline (Patricia, 2013). The main purpose of infection control is to reduce the occurrence and transmission of infectious diseases. Specialized training must be received before health staff undertakes any patient's procedure involving patient's secretions or blood and handling sharp devices (ID, 2014). Germs are a part of everyday life and are found in our air, soil, water, and in and on our bodies. Some germs are helpful, others are harmful. Many germs live in and on our bodies without causing harm and some even help us to stay healthy.

All environments that provide care to groups of patients will be conducive to the development and spread of infections. Major reservoirs of pathogens include the patient's own bacteria and other micro-organism with in hospital and community environments. Infection can be introduced through people, equipment and contaminated items, to ensure effective protection of the public's health and minimize the risk of health care associated infections (HCAI's) effective prevention and control must be embedded into everyday practice and applied consistently by everyone. All staff specially nurses, both clinical and non-clinical must be able to demonstrate good infection control and hygiene practice. Control method are designed to either destroy the source or break the "chain of infection" thus preventing its transmission and halting the spread of disease.

Generally effective decontamination, be it on hands, the environment, equipment and medical devices is

core to preventing the acquisition and transmission of infections, the use of personal protective clothing and equipment provides another line of defense.

Healthcare-associated infections (HAIs), also known as nosocomial infections, are infections acquired following admission to a healthcare facility that weren't present before admission. The CDC, 2015, estimates that 1 in 20 patients will develop an HAI. All patients are susceptible to HAIs because of potential exposure to microorganisms while in the healthcare setting. And because of frequent contact with patients who harbor these microorganisms, nurses have a higher occupational exposure than other healthcare professionals. As nurses, we can serve as leaders in preventing HAIs by modeling behaviors to prevent transmission of microorganisms between patients, including proper use of PPE, following agency policies, and understanding the vulnerability of our patients.

To identify clear responsibilities from special area to the ward all health staff should apply the standard infection control procedure as a routine part of clinical practice as outlined in Health and Social Care Act 2008. The code of practice on the prevention and control of infection (DH, 2015).

Health Care workers specially nurses have to understand the chain of infection and ways to disrupt this chain to protect the patients on health. Links of the chain include the microorganism (causative agent), reservoir, portal of exit, mode of transmission, portal of entry, and susceptible host CDC, 2016, recommends scrubbing hands for at least 20 seconds, using soap, water, and friction, and paying special attention to the areas between fingers, the backs of hands, underneath fingernails, and the thumbs. Humming the "Happy Birthday" song twice or the "Alphabet" song or "Twinkle, Twinkle Little Star" once can help count the time. Alcohol-based hand rubs should be rubbed into all surfaces of the hands until dry.

This study was anchored on Benson, Sandra model on a nurse's role in infection prevention (May, 2011). The model states that Nurses have the unique opportunity to reduce the potential for hospital-acquired infections. Utilizing the skills and knowledge of nursing practice, nurses can facilitate patient recovery while minimizing complications related to infections. It was of interest to the researchers to determine whether the infection control program is being implemented in to the different departments of Tobruk Medical Center.

METHODS

A comprehensive description of the methodology of the study was introduced. It is composed of the research design; population and locale of the study; data collection instrumentation and treatment of data.

This research utilized a descriptive non-experimental design, as such data was collected using researcher prepared questionnaire to assess 4 aspects of infection control program. The respondents consisted of Nurses in Tobruk Medical Center who are working in the 4 departments (medical, surgical, special areas, and Obstetrics and Gynaecology department). Convenience sampling was employed such that all nurses who was on duty on the time of data collection was included in the study.

The study is descriptive in nature where it used survey-questionnaire to acquire value of facts needed. Descriptive survey method is a fast finding study with adequate and accurate interpretation that includes a purpose process of gathering analyzing, classifying data about the present conditions, practices beliefs and trend. This is the most fitted design for the study since it attempted to describe the level of implementation of the infection control by labeling, analyzing and interpreting the data that were presented.

The study was conducted from January to October, 2018 at Tobruk Medical Center, Tobruk, Libya. The research tool consisted of two part: Part 1 is about the required profile information such as gender, course completed, and work area in Tobruk Medical Center. Part II is survey questionnaire which is the main instrument used to obtain the necessary data for this study. The two-part questionnaire was bilingual (English and Arabic) to ensure that the respondents understood each question item.

The devised questionnaire consists of questions describing the level of implementation of infection

control based on infection control policy of Miche and Ile Berhanu. The question from 1 to 5 are pertaining to hand washing while questions number 6 to 10 pertains to disinfections/sterilization/ autoclave. On the other hand, question 11 to 15 pertain to the use of personal protective equipment, and question number 16 to 20 pertaining to the proper clinical waste disposal.

A 4-point liker scale is employed for answering the questionnaire with a score of 4 for the response "always", 3 "most of the time", 2 for "sometimes" and a score of 1 for the response of "never" collected data were tallied and presented in tables to permit ease of analysis. Frequency distribution tables were made for the profile variables of gender, course completed and work area, while separate tables were constructed for the level of implementation of the respondents.

Simple statistical analysis was utilized for the analysis and subsequent interpretation. Frequency and percentage were used for the profile variables weighted means were used for the level of implementation. The level of implementation was interpreted using the following table:

Table 1. Mean Score and Interpretation.

Mean Score	Interpretation
1 – 1.50	Very low level
1.51 – 2.50	Low level
2.51 – 3.50	High level
3.51 – 4.00	Very High level

RESULTS AND DISCUSSION

Table 2. Distribution of Respondents According to Course Completed.

Degree	Frequency	Percentage (%)
Nursing Diploma	34	85
BSN	6	15
Total	40	100

Table 2 shows the distribution of the respondents according to their completed courses. It shows out that out of 40 respondents, 34 (85%) are holder of Diploma in Nursing degrees, only 6 (15%) are graduated as a Bachelor of Science in Nursing (BSN). This is due to the

fact that mostly Libyan Nurses in Tobruk graduated from the Higher Institutes of Nursing while all foreign nurses (Filipino, Ukraine and Indian) are graduated as BSN.

Table 3. Distribution of Respondents According to Work Area.

Department	Frequency	Percentage (%)
Medical	12	30.00
Surgical	11	27.50

Maternal and Child	3	7.50
Special Area	14	35.00
Total	40	100

Table 3 shows the distribution of the respondents by work area, majority (14) are working in the special area, representing 35% of all nurses who participated in the study. It is followed by those who are working in medical ward, surgical, and maternal and child

department with corresponding frequency of 12, 11, and 3, respectively. This distribution was most likely due to the fact that majority of the respondents are from the special area and data was collected during duty hours.

Table 4. Summary of Level of Implementation of Infection Control. VL (very low level), mean 1.00-1.50: L (low), mean 1.51-2.50: H (high), mean 2.51-3.50: VH (very high) mean 3.51-4.00.

Program	Mean	Interpretation
Handwashing	2.74	High
Disinfection/sterilization	3.51	Very high
PPE	3.23	High
Proper Waste Disposal	2.73	High
Over-all	3.05	High

Table 4 shows the summary of the level of infection control practiced by the nurses. It shows that disinfection was performed at very high level while hand washing, personal protection and waste disposal were performed at a high level. Among the gathered

data handwashing and waste disposal had a relatively lower mean score. Therefore, there is a need to enhance the practice of proper waste disposal and handwashing.

Table 5. Differences in level of implementation by profile variables. VL (very low level), mean 1.00-1.50: L (low), mean 1.51-2.50: H (high), mean 2.51-3.50: VH (very high) mean 3.51-4.00.

Gender	Program	Weighted Mean	Interpretation
Male	Handwashing	3.00	High
	Disinfection/Sterilization	3.60	Very High
	Personal Protective Equipment	3.35	High
	Waste Management	3.28	High
	Over-all	3.31	Very High
Female	Handwashing	2.50	Low
	Disinfection/Sterilization	3.47	High
	Personal Protective Equipment	3.46	High
	Waste Management	2.34	low
	Over-all	3.05	High

Table 5 shows that the male have higher mean than female. It shows that disinfection was performed at a very high level while handwashing, use of personal protective equipment and proper waste disposal were performed at a high level, therefore infection control is

being practiced by the male nurses. In female, disinfection was performed at high level followed by personal protective equipment and handwashing while proper waste disposal had the lowest mean score,

therefore there is a need to enhance infection control in this area.

Table 6. Differences in Level of Implementation of Infection Control by Course Completed. VL (very low level), mean 1.00-1.50: L (low), mean 1.51-2.50: H (high), mean 2.51-3.50: VH (very high) mean 3.51-4.00.

Course Completed	Program	Weighted Mean	Interpretation
BSN	Handwashing	2.90	High
	Disinfection/Sterilization	3.63	Very high
	Personal Protective Equipment	3.67	Very high
	Waste Management	2.67	High
	Over-all	3.22	High
Diploma	Handwashing	2.96	High
	Disinfection/Sterilization	3.43	High
	Personal Protective Equipment	3.31	High
	Waste Management	2.81	High
	Over-all	3.13	High

Table 6 shows that the Bachelor of Science in Nursing has a higher level of implementation of infection control than the nurses who graduated with Diploma from Nursing Institute. It shows that BSN wearing personal protective equipment (PPE), and disinfection

was performed at Very High Level. It also shows that Diploma Nursing practiced the 4 areas of infection control at a high level, therefore there is no need to enhance in these areas.

Table 7. Difference in Level of Implementation of Infection Control by Work Area. VL (very low level), mean 1.00-1.50: L (low), mean 1.51-2.50: H (high), mean 2.51-3.50: VH (very high) mean 3.51-4.00

Work Area	Program	Weighted Mean	Interpretation
Medical	Handwashing	1.75	Low
	Disinfection/Sterilization	3.30	High
	Personal Protective Equipment	3.67	Very high
	Waste Management	2.67	High
	Over-all	2.85	High
Surgical	Handwashing	2.72	High
	Disinfection/Sterilization	3.27	High
	Personal Protective Equipment	3.45	High
	Waste Management	2.61	High
	Over-all	3.01	High
Maternal and Child	Handwashing	2.92	High
	Disinfection/Sterilization	3.40	High
	Personal Protective Equipment	3.13	High
	Waste Management	2.60	High
	Over-all	3.01	High
Special Area	Handwashing	3.37	High

Disinfection/Sterilization	3.77	Very high
Personal Protective Equipment	3.44	High
Waste Management	3.40	High
Over-all	3.49	High

Table 7 shows that the special area has a higher level of implementation of infection control than the other three areas, it shows that surgical ward, Maternal and Child department have equal level of implementation of infection control while medical ward have a low weighted mean score (1.75) in Handwashing, therefore there is a need to enhance infection control in this area.

DISCUSSION

Profile of the respondents

There is equal number of respondents according to gender. A total of 34 (85%) of the respondents were Bachelor of Science in nursing and 6 (15%) of respondents from the nursing diploma. Majority of the respondents were from special area 14 (35%), followed by the medical ward 12 (30%), surgical 11 (27.50%) and Maternal and Child 3 (7.50%).

Level of Implementation of Infection control

The study showed a high level of implementation of infection control at Tobruk Medical Center, it shows that disinfection was performed at very high level while hand washing, personal protective equipment, and waste disposal were performed at high level. Among these, hand washing and waste disposal had relatively lower mean scores. There is therefore a need to enhance the infection control activities in these two areas.

Relationship of respondents on the level of Implementation of Infection control

It shows that disinfection/sterilization had the highest weighted mean of 3.51 which was interpreted as Very high level. This followed by personal protective equipment, Hand washing, Proper waste disposal with the weighted mean of 3.23, 2.74, and 2.73 respectively.

The bachelor of science in nursing and nursing diploma have almost equal overall weighted mean of 3.22 respectively, which was interpreted as High level of implementation.

It can be seen that the special area had the highest overall mean of 3.49 which was interpreted as High level of Implementation. This followed by surgical and Maternal and Child which have equal mean of 3.01

which was interpreted as High level. The lowest was the Medical department with the overall mean of 2.85, was interpreted as high level of implementation.

Standard infection control procedure underpins safe practice, reducing the risk of staff and patients from healthcare related infection (Loveday et al.2014) since examination and medical history alone cannot reliably identify all patients colonized or infection with transmissible pathogens standard infection control procedures represent the standard of care to be used routinely for all patients regardless of perceived or known infection risk factors.

Effective hand hygiene or hand washing is a critical components of standard infection control procedures and when used as a part of bundle of measures, correctly implemented, will minimize the spread of infectious organisms and reduce health care acquired infection. PPE includes gloves, gowns, masks, respirators, and eyewear that create barriers to protect skin, clothing, mucous membranes, and the respiratory tract from infectious organisms. The item selected depends on the infectious agent, the type of interaction, and the method of microorganism transmission

For standard of precautions to be effective, high levels of compliance must be achieved by all health care staff involved in patient care. Experience shows that achieving high levels of appropriate hand hygiene compliance, in particular, can be difficult. Continuous commitment is required throughout the.

CONCLUSION

There are significant differences in the level of implementation of infection control when the respondents were divided according to their profile. The hypothesis is therefore rejected.

It shows the males implement infection control at a higher level than females do. The Bachelor of Science in nursing degree holders implement infection control at a higher level than the nursing diploma graduates. Infection control was highly implemented in the special areas more than in any other wards.

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