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Knowledge and Practices of Safety Measures among Operation Theater Technicians in Sheikh Zayed Hospital Rahim Yar Khan

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Abstract:

Health care workers are prone to many kinds of hazards and injuries during their whole life due to the nature of the duty. Hazards can be physical like lacerations and cuts due to scalpel or needle prick, chemical, mechanical, infectious hazards and hazards due to radiations. So it is necessary for health care workers to adopt safety measures that they can protect themselves from these hazards.

Key words

Knowledge of safety measures, practices of safety measures among Operation Theatre Technicians.

Objective:

The objective of this study was to determine the knowledge and practices of safety measures among operation theatre technicians of Sheikh Zayed Hospital Rahim Yar Khan.

Methodology:

We conducted study at Sheikh Zayed Hospital, Rahim Yar Khan. Duration of study was 17-04-2017 to 21-05-2017.Subject under study was OT technicians of Sheikh Zayed Hospital, Rahim Yar Khan. Inclusion criteria was that the OT technicians present at the time of data collection in all 3 duty shifts gave informed verbal consent. Exclusion criteria was that some OT technicians did not give informed verbal consent. Sample size was 40. Data was collected by pre-designed questionnaire Including variables on age, sex and education, vaccination and questions on knowledge of safety measures like disease transmitted, protective measures and variables on practice work, whether they use gloves, gowns, masks shoe and head cover during OT work. Data was entered and analyzed by using SPSS-20.Ethical approval was sought from institutional review board before commencing study. Informed verbal consent was taken before data collection.

Results:

The results of this study were that 80% OT Technicians have knowledge of face mask as safety measure,70% of head covers,67.5% of gloves,60% of gowns and 72.5% of shoe cover.100% wear face masks and shoe covers,92.5% wear head cover,85%wear gloves and 90% wear gowns.

Conclusion:

The Study showed that among OT technicians of Sheikh Zayed Hospital, Rahim Yar Khan three fourth have correct knowledge of transmissible diseases during OT work. One third do not have correct knowledge of safety measures during OT work. One tenth do not practice all steps of safety measures.

1. Introduction

Operation theatre technicians and nurses play an important role in maintaining the health and well-being of patients. One type of nurse also called Operation theatre technician in particular is the pre-operative nurse, which is commonly referred to as the operating room nurse. They are registered nurses who take care of patients before, after and during surgery. Before starting the reader should know some important definitions:

SAFETY: The state of being "safe" (from French sauf), the condition of being protected from harm or other non-desirable outcomes. Safety can also refer to the control of recognized hazards in order to achieve an acceptable level of risk.

OPERATING ROOM TECHNICIAN: An operating room technician is a healthcare worker who is a professional registered nurse and assists the surgeon and the surgical team in their tasks. Operating room technician are responsible for the supply of all of the surgical needs and for keeping of inventory of all of the various items that were used during the operation. They also tend to the health and care of the patient in the operating room, oversee the work organization within the operating theater, and mediate between the various hospital departments, the surgeons, and the management.

Ensuring the safety of patients as well doctors is the job of operation theater technician. Certified surgical technologists function in non-sterile and sterile capacities by creating an optimal environment for surgical patients. They are of following types:

Circulating Nurses: In the operating room, circulating nurses remain in the unsterilized field. These nurses are not scrubbed, and do not wear gloves or a gown. Their role is to monitor and document the procedures taken during the operation. Circulating nurses also function to promote the sterility of the operating room . They inform operating room staff of anything that may cause contamination. They are also responsible for opening autoclaved packages, which are packages that hold sterile objects, so that the operating room staff may easily access the sterile equipment.

Scrub Nurses : Scrub nurses remain in the sterile field of the operating room and follow the designated scrub procedure, wear gloves, a mask and gown. Scrub nurses aid surgeons by handing them equipment, sponges and other necessary instruments needed during the operation. They also help the surgeon by monitoring the patient's condition during the procedure.

Registered Nurse First Assistant (RNFA) : RNFA nurses have had additional education and training in surgical care. These nurses have more responsibilities within the operating room and work directly with surgeons. Their job is to help surgeons by controlling patient bleeding, use instruments and medical devices during the operation, perform invasive procedures such as cutting tissue, and suture the patient when the operation has finished.

Next is our topic of discussion which is about the study on the hazards faced by operation theatre staff and the safety measures they adopt.

The fundamental ethic of health care is that sick persons must receive care. This premise carries an unstated consequence: an occupational risk to healthcare workers who respond to the needs of contagious patients .We come across on daily basis a number of incidents occurring due to carelessness of the technicians in operating room , during handling of samples or during surgical procedures and thus having diseases transmitted to them via needle pricks or by direct contact to the blood or body fluids of the patients having communicable infections. Certain groups of individuals are at greater risk than others because of the nature of their work especially the health care workers because they handle sharp devices or equipment's such as scalpels, sutures, hypodermic needles, blood collection devices or phlebotomy devices. The most common sharps injury is caused by needles . Numerous studies have found nurses to be the commonest group of HCWs experiencing needle stick injuries .Needle stick injury is defined as any

per cutaneous injury with sharp equipment used in the delivery of medical care. Such equipment may include hollow-bore needles, suture needles, scalpels, IV equipment, etc (1). The increased incidence of needle stick injuries in HCW is known to arise from a combination of high risk activities with low safety measures (activities including administering injections, drawing blood, recapping needles, disposing of needles, handling trash and dirty linen and transferring blood or body fluids from a syringe to a specimen container and missing the target). Such behavior not only affects the quality of care delivered by the HCW but also affects the safety and well-being of care providers. Furthermore, HCWs in high risk areas of hospital setting are potentially at an increased risk of exposure and experience substantial anxiety and depression, which may lead to changes in occupation and behavior. Hence, needle stick injuries not only lead to increased risk of developing infections but also affect the mental health of health care providers 2 millions Needle stick injuries are reported in health care providers every year. But these are only the reported cases and. A European survey of Needle stick injury found that nurses (91%) are the main group among health care providers who are more exposed to needle stick injuries as compared to doctors and phlebotomist. Needle stick injuries may increase hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) transmission risk in the healthcare workers (2).

It is estimated that in United States approximately 385,000 needle stick and sharp-related injuries occur every year to healthcare workers in hospital settings (Centre for disease control and prevention). Globally, out of 39.5 million health-care workers, three million experience percutaneous exposure to infectious diseases each year and 40% of hepatitis B, and C and 2.5% of HIV/AIDS in HCWs are attributed to needle stick injuries World health report, Geneva (3).

An estimated 600,000 to 800,000 needle stick and other per cutaneous injuries are reported annually among U.S. HCWs. It is estimated that 100,000 needle stick injuries occur annually in UK alone and 500,000 annually in Germany (4).As often occurs when infectious disease outbreaks are caused by an emerging agent, healthcare workers were the group most affected. According to the World Health Organization, 8,098 cases occurred during the outbreak of SARS, and 774 (9.6%) persons died . Healthcare workers accounted for 1,707 (21%) of the cases (5). More specific information from outbreak hospitals in Hong Kong , Singapore , Guangdong Province, and Toronto showed that 378 (57%) of 667 cases occurred in healthcare workers or medical student. In contrast, in developing countries, exposure and health impacts are rarely monitored and much remains to be done to protect HCWs from such risks that cause infections, illness, disability, and death, that may in turn impact on the quality of health care. While >90% of blood borne infections occurs among HCW in developing countries World health report, Geneva reporting of such events is rarely done. About 40-70% cases of needle stick injuries are unreported in developing countries .An Indian study also showed that most of the needle stick injuries occurred in nurses (45%) among health care worker. This study further reveals that among nurses who got NSI Twenty three (23) were positive for Hepatitis B surface antigen, 15 were positive for HIV and 12 were positive for HCV. The under reporting of NSI events appears to be common within hospital environments; with surveys suggesting that ≤ 80% of nurses do not officially report their NSI incidents (6).

In Pakistan: According to World Health Organization (WHO) regional classification, Pakistan comes in Eastern Mediterranean Region D (EMR D). Unfortunately this region has the highest rate of needle stick injuries as compared to the entire world .The incidence and prevalence of chronic liver disease due to HBV and HCV is gradually increasing in Pakistan. An increasing number of these patients are brought to tertiary care hospitals for diagnosis and management. This puts HCWs and the patients they deal with, at an ever growing risk of exposure to these blood borne pathogens. Even though there are many sources of spread of these blood borne pathogens, sharps injuries remain a major source of HCV infection among HCWs, accounting for almost 40 % of HCV infections. Contaminated sharps were estimated to cause 66,000 HBV infection annually, associated with 261 deaths. Different studies from Pakistan reported prevalence of NSI ranging from 45% to 94% among HCW ; however, these were

conducted in a single hospital and had small sample sizes (7). A big incident recently took place in Bahawalpur, Pakistan where Doctors and a nurse lost their lives after treatment of a patient suffering from Congo viral infection. Senior Registrar Dr. Sagheer Sameeja was put on ventilator and laboratory reports of Agha Khan Karachi Hospital confirmed Congo virus from Miss Nadia of Lodhran who underwent a surgery at Bahawalpur Victoria Hospital's surgery ward. The surgery was performed by Dr. Sagheer. A student- nurse expired a day after surgery. Two other Doctors who were assisting Dr. Sagheer during surgery also have had Congo viral infection.

The hazards that operation theatre technicians and health care workers face in operation theatre everyday are as follow:

Physical Hazards:

Physical injuries, including cuts, pricks, electrical shocks, burns and falls are some of the most common hazards in operating rooms.

Biological Hazards:

People working in operating rooms regularly come into contact with blood and other body fluids. They can easily be exposed to a number of diseases -- including HIV and hepatitis -- if they sustain a cut or prick from a sharp surgical tool that has been contaminated or if particulate releases come into contact with their eyes. Human error is an exogenous source of contamination, not to be underestimated. If breaks in technique occur through lack of knowledge or lack of adherence to the principals of technique and their applications ,the patient is exposed to risk that could have been prevented (8,9).

Chemical Hazards:

Anesthetic equipment can malfunction during surgery. Leaks in the connective tubing allow anesthetic gases to seep out, exposing everyone in the operating room. Exposure to waste anesthetic gases can harm a person's motor skills, reflexes and alertness (10).

Safety Measures for Operation Theatre Technicians:

Besides surgeon and assistants, Operating room technicians are equally prone to the hazards of Operation Theater. In order to avoid any hazardous outcome, they must take care of them and should adopt following measures to be safe (12).

The need for sterile technique:

Strict aseptic and sterile techniques are needed all times in the Operation Theater, because freshly incised or traumatized tissue can easily become infected. Therefore, anything unsterile in the contact with any personnel is potentially dangerous and can transfer microbes. All operative procedures are performed under sterile conditions. Conversely, terminal decontamination and sterilization of all material and equipment used during an operation is performed with the assumption that every patient is a potential source of infection for other persons (13).

● Vaccination: They must have vaccination against most common infections caused merely by a needle prick e.g. Hepatitis B, C infection (14).

● Orientation of new staff members: There should be proper training for all members about handling the contaminated samples, blood stained instruments and equipments or any infected tissue removed by a surgery. It is

important that all new members are introduced to the operating theater on the first day or as soon as possible to familiarize themselves in the new and unknown surrounding. Every member of the health facility should be oriented including staff members from health centers and clinics.

● In-service training: The operation theater must have regular in-service training programmes in the form of discussions, demonstrations with regard to procedures and methods can be done. The medical-legal risks in the operating theater and recovery room must be emphasized time and again.

● Hand Hygiene: They should take care of hand hygiene before and after contact with any of the object described above.

● In case of diseased patient: If a patient is suffering from any communicable infectious disease, they should be more vigilant in handling the patient and samples collected from him.

● Waste disposal: There should be proper waste disposal methods to avoid any kind of contamination.

●Disinfection of area: Operating room technicians must have training of disinfection of area after the surgical procedure.

●Know about diseases: They must have knowledge of modes of transmission of various diseases so that they might protect themselves.

● Awareness of Hazards: They should have awareness of all possible hazards of operation theater e.g. biological hazards, chemical hazards, occupational hazards etc.

● PPE (personal protective equipments): People in operating room must wear PPE (personal protective equipments) which include the following :

● Head cover: All facial and head must be covered in the restricted area. Headgear should fit well to prevent any escape of hair and to confine micro-organisms. A cap or hood is put on before a scrub suite or dress to protect the garment from contamination by hair.

● Surgical mask: Masks over their lower face , covering their mouths and nose with minimal gaps to prevent inhalation of plume or airborne microbes.

● Eye protection: Goggles and face shields: Shades or glasses over the eyes, including specialized colored glasses with different lasers . A fiber-optic headlight may be attached for greater visibility. Eye protection must be worn as part of personal protective equipment to act as a barrier to infectious material entering the eye during all invasive surgical procedures, including endoscopic procedures or in any situation where splash injury to the eyes could occur.

● Surgical Scrub: The surgical scrub is the process of removing as many micro-organisms as possible from the hands and arms by mechanical washing and chemical antiseptics before participating in an operative procedure.

The purpose of surgical scrub is to remove soil, debris, natural skin oil sand micro-organisms from hands and forearms of sterile team members. The surgical scrub is done just prior to gowning and gloving for each operation.

●Gloves: Vinyl gloves on hands ; latex is used as well, but much less common due to latex sensitivity which affects some health care workers and patients. Sterile gloves complete the attire for scrubbed team members. They are worn to permit the wearer to handle sterile supplies or tissues of the operative wound.

● Gown: Sterile long gowns , with bottom of the gown no closer than six inches to the ground.

● Appropriate operation room shoes and shoe covers: that cover the feet must be worn all times in the restricted area . Overshoes are not recommended.

● In case of radiations: If X-rays are expected to be used, lead aprons /neck covers should be used to prevent over exposure to radiation.

2. Objectives

The objectives of this study were to:

1. Assess the knowledge about the safety measures among Operation Theatre Technicians.
2. Determine of practices about safety measures among Operation Theatre Technicians.
3. Determine the demographic features of Operation Theatre Technicians.

3. Material and methodology

Study Design:
Cross sectional study

Study population:
OT Technicians in Sheikh Zayed Medical College & Hospital, Rahim Yar Khan.

Setting:
Sheikh Zayed Hospital, Rahim Yar Khan

Duration of study:
17th April to 21st May 2017

Sample size:
A total of forty OT Technicians were included in study.

Sample technique:
Non probability convenient sampling technique.

Inclusion Criteria:
1. OT technicians of either sex present at the time of data collection in all three duty shifts.
2. Those who gave informed verbal consent for data collection.

Exclusion Criteria:
1. Those who didn't give informed verbal consent for data collection were excluded.

Data Collection Procedure:
Pre-designed questionnaire was used to collect data.

The questionnaire included variables on age, sex, education, vaccination status. Questions on knowledge of safety measures like disease transmitted, protective measures & variables on practice work, whether they use gloves, apron, masks, head cover, shoe cover during OT-work.

Data Analysis:

Data was entered and analyzed by using SPSS-20.

Numerical variables like age, were presented as mean (+,-) Standard Deviation.

Categorical variables like sex, education, vaccination status, knowledge and practices regarding safety measures are presented as percentages.

Ethical Approval:

Ethical approval was sought from conduction of institutional review board for study conduction & informed verbal consent was taken before data collection.

4. Results

Table I: Age of study subjects

Characteristics of age	No.
Mean	27.4
Std. Error of Mean	1
Median	26
Mode	22.00[a]
Std. Deviation	6.600
Range	36.00
Minimum	19.00
Maximum	55.00

Table I Shows that the mean age of study subjects was 27.4, median was 26, mode 22 and standard deviation 6.600.

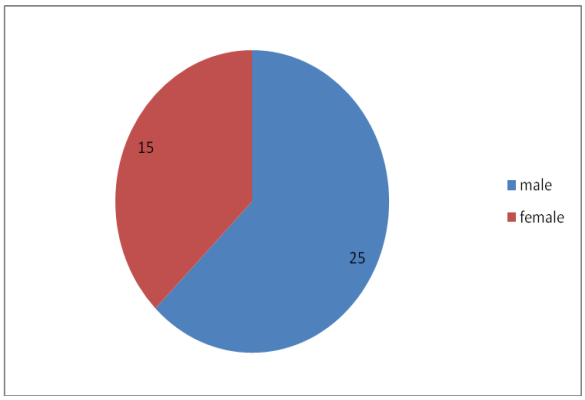

Figure I: Sex distribution among study subjects

Fig I shows that among OT technicians 25 were male and 15 were female.

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Table II: Monthly income status of OT technicians

Monthly Income (Rs)Characteristics	No.
Mean	22624
Std. Error of Mean	1891
Median	2000
Mode	20000
Std. Deviation	11031
Range	43000

Table II shows that mean income of OT technicians was Rs; 22624, median 1891, mode 20,000 and standard deviation 11031.

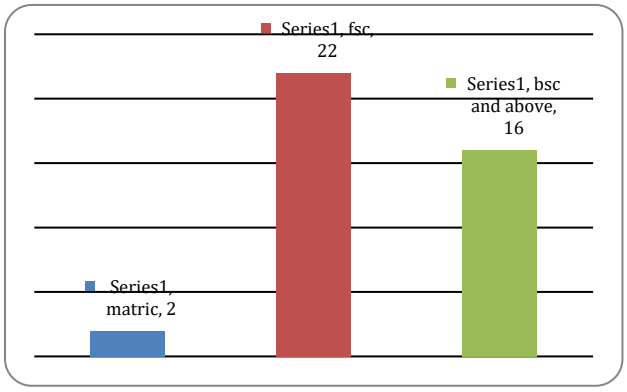

Figure II: Education of study subjects
Figure II shows that the majority of OT technicians were FSc. and BSc.

Table III: Knowledge & Practice of face mask by Operation Theatre technicians In Operation Theatre

Status	Frequency	%age
Yes	40	100
No	0	0
Total	40	100

Table III shows that 40(100%) of OT technicians Wear face mask in Operation Theatre.

Table IV: Knowledge & Practice of head covers by OT technicians In Operation Theatre

Status	Frequency	%age
Yes	37	92.5
No	3	7.5
Total	40	100.0

Table IV shows that 37(92.5%) of operation theatre technicians wear head cover in operation theatre, while 3(7.5%) not wear head cover.

Table V: Knowledge & Practice of gloves by Operation Theatre technicians In Operation Theatre

Status	Frequency	%age
Yes	34	85
No	6	15.0
Total	40	100.0

Table V shows that 34(85%) OT technicians wear gloves in operation theatre, while 6(15%) not wear gloves.

Table VI: Knowledge & Practice of gowns by OT technicians In Operation Theatre

Status	Frequency	%age
Yes	36	90
No	4	10.0
Total	40	100.0

Table VI shows that 36(90%) of OT technicians wear gowns in OT, while 4(10%) not wear gowns.

Table VII: Knowledge & Practice of OT shoes wearing by OT technicians In Operation Theatre

Table VII shows that 40(100%) of OT technicians wear shoes in operation theatre.

Status	Frequency	%age
Yes	40	100.0
No	0	0.0
Total	40	100.0

Table VIII: Hepatitis B vaccination status

Status	Frequency	Percent

Yes	21	52.5
No	14	35.0
Don't Know	5	12.5
Total	40	100.0

Table VIII shows that among OT technicians 52.5% were vaccinated, 35% not vaccinated and 12.5% have no idea.

Table IX: Training during service

Status	Frequency	Percent
Yes	24	60
No	16	40
Total	40	100.0

Table IX shows that among OT Technicians 60% people has training during service and 40% do not have training.

Table X: Perception of OT Technicians about transmissible diseases During Operation Theatre work

Disease	NO.	%age
Hepatitis	30	75%
AIDS	25	62.5%
Bacterial/Viral Infections	9	22.5%
TB	8	20%
Skin disease		
Others	17	42.5%

Table X shows that 30(75%) OTT responded that hepatitis is transmissible disease during OT work, 25(62.5%) said AIDS, 10(25%) bacterial infections, 9(22.5%) TB,8(20%) skin disease and 17(42.5%) said other diseases.

5. Discussion

This study assessed the safety measures among the OT technicians in Sheikh Zayed Medical College and Hospital Rahim Yar khan. The basic idea to conduct this study was that we wanted to know the infectious and life threatening diseases to which OT technicians are very much exposed during their contacts with the patient. In our study among OT technicians 62.5% were male and 37.5% female and mean age of study subjects was 27.4, median 26, mode 22 and standard deviation 6 years.

In a previous study on knowledge, attitude and practices of laboratory safety measures among paramedical staff of laboratory services done by Hansa M Goswami,et al, in contrast to current study, there were less males, 45.68% and 54.32% were females and higher mean age of males was reported to be 33 ±6 years and mean age of females was 30.5 ±10.3 years (15).

In current study, 30(75%) OTT responded that hepatitis is transmissible disease during OT work, 25(62.5%) said AIDS, 10(25%) bacterial infections, 9(22.5%) TB, 8(20%) skin disease and 17(42.5%) said other diseases 32(80%) and 32(80%) OTT have knowledge of face mask as safety measure, 28(70%) of head covers, 27(67.5%) of gloves, 24(60%) of gowns and 29(72.5%) OTT have knowledge of shoes cover as safety measure during OT work while it has been founded in previous study that only 46% nurses or lab technicians have correct knowledge about transmissible diseases and safety measures such as use of gloves.

In our study it is noted that among OT technicians 52.5% were vaccinated, 35% not vaccinated and 12.5% have no idea while in another study conducted to assess the hepatitis-B vaccination status , knowledge, attitude and practice of High risk health care workers ,it was reported almost similar to current study 64% subjects were vaccinated , 31% had no idea about vaccination and 45% knew about vaccination but still they were not vaccinated (16).

Limitation of this study included; a relatively small sample size, mainly due to time constraints and we included only one institute that too a public sector hospital, it would have been better to include more public sector and private sector hospitals in this study. Additionally convenient sampling technique was used that has its inherent problems of lack of generalizability.

6. Conclusion

This study showed that one in four OT-Technicians does not have knowledge of Hepatitis as transmissible disease. One in three OT-Technicians does not have knowledge of AIDS as transmissible disease. Three in four OT-Technicians do not have knowledge of Bacterial and Viral Infections as transmissible disease. Up to one third of OT-Technicians don't have correct knowledge of safety measures during OT-work. About one out of ten OT-Technicians don't practice all steps of safety measures. Additionally, half of the OT-Technicians aren't vaccinated against Hepatitis B. About half of the study subjects weren't trained during service regarding safety measures. This study concluded that only up to three fourth OT-Technicians have correct knowledge of safety measures in operation theatre.

7. Recommendations

It is recommended that further researches should be carried out in our country about knowledge and practices of safety measures among operation theatre technicians during operation work.

i. Strong rules and relegations should be set in Pakistan so that everyone should follow safety health measures.

ii. Moreover, vaccination of all health care workers should be done with documentation.

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