بسم الله الرحمن الرحيم

University of Shendi

Faculty of graduate studies andscientific research

Prevalence of Needle Sticks and Sharpe Injuries among Nurse`s in ElmakNemir University Hospital

A Thesis Submitted in requirements of partial fulfill of M.Sc.Medical Surgical Nursing.

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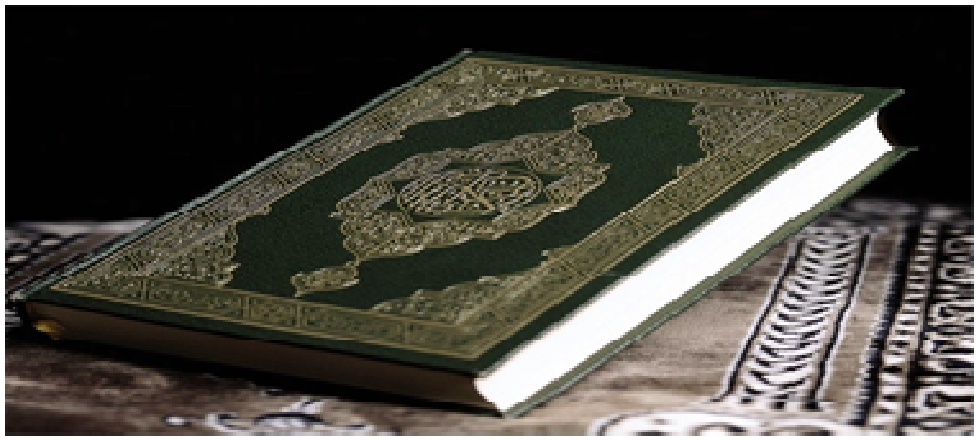
الآيـــة



[وَأَقِيمُوا الصَّلاةَ وَآتُوا الزَّكَاةَ وَمَا تُقَدِّمُوا لأَنفُسِكُم مِّنْ خَيْرٍ تَجِدُوهُ عِندَ اللَّهِ إِنَّ اللَّهَ بِمَا تَعْمَلُونَ بصير](110) البقرة

Dedication

My since gratitude shall be submitted first to "Allah" who always helps and care for me.

I feel always indebted to "Allah" the most kind and merciful.

To person who gives me force and support me forever, and feeling me secure.

My father

To the person who give me constant source of inspiration, who light my life and always say to me (it's possible)

My mother

To my brothers for support me and engorgement

To my sister (hoiam)

To my colleges

Researcher

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I would like to thank nursing staff in ELmekNimer university hospital and spatial thank to nurse`s in renal canter.

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I would thank to my teachers in nursing Science College,Shendi University.

ملخص الدراسة

المقدمة :

الاصابة بالابر والادوات الحادة هي واحدة من اخطر الاصابات المهنية حيث يتسبب في عواقب وخيمة متمثلة في انتقال الامراضة الفيروسية والاضطراب النفسي .

الدراسة:نوع

اجريت هذه الدراسة الوصفية في مستشفي المك نمر الجامعيفي الفترة من يوليو الي نوفمبر 2014.شملت الدراسة كل الممرضيين بالمستشفى وعددهم 120.تم جمع البيانات باستخدام استبيان قياسي مغلق الاسئلة مكونة من 18 سؤال .

بعد جمع البيانات تم تحليلها يدويا ومن ثم باستخدام برنامج التحليل الحزمي للبيانات بالحاسوب اصدارة (11.5).

الاهداف

اجريت الدراسة بغرض تقييم معدل انتشار الاصابة بوخز الابر والادوات الحادة في مستشفى المك نمر الجامعي والتعرف علي اكثر العوامل والادوات المتعلقة بحدوث الاصابة وتكراره .

النتائج

توصلت الدراسة الي ان معدل انتشار الاصابة عالية جدا بنسبة (79.2%) ومن اهم العوامل المعرضة لحدوث الاصابات هو اعادة تغطية الابرة(42.4%) بعد ستخدامها، وايضا ان معظم الاصابات تحدث اثناء عمل القسطرة الوريدية (34 %) .

توصلت الدراسة الي انخفاض معدل الابلاغ الفوري للاصابات حيث (78.9%) من الاصابات لم تبلغ .وايضا وضحت الدراسة وجود علاقة احصائية قوية لمعدل حدوث الاصابات مع كل من مكان العمل وسنين العمل بالمستشفى .

التوصيات :

توصلت الدراسة الي عدة توصيات ثمثلت في تفعيل دور وحدة مكافحة العدوى في المستشفى ,التدريب المستمر وتقديم ورش عمل حول مكافحة العدوى والوقاية من الاصابة بالالات الحادة اثناء العمل ,وايضا اوصت الدراسة بالزام الممرضين بكتابة تقارير فورية لوحدة تحكم العدوى عند حدوث اصا بة بوخز الابر أوالادوات الحادة, والاهتمام بتحصين كل الممرضين ضد الامراض الفيروسية .

Abstract

Introduction:

Needle stick andSharps injuries are one of the most serious occupational accidents among nurses due to the possible severe consequences, such as the transmission of infectious diseases and emotional distress.

Studydesign:

Descriptive, hospital-based study, was conductedin Shendi city in ElMekNimir University hospital in2014,study covered all nurse`s in hospital they were 120 nurse,standard closed ended questioner was been used to data collection.The collected data was analyzed manually and then by using Computer software SPSS program version (11.5).

Objectives:

To assess prevalence of needle sticksand sharp injuries among nurse`sin ElMek Nimir University hospitaland identify the commonest clinical activity, item, factors associated with needle stick and sharp injury.

Result:

study concluded higher prevalence rate of needle stick and sharp injuries among nurse`s (79.2%), the most (42.4%) contributing factor is recapping of used needle and most (34%) of injuries occurred during canulation procedure. Study showed low reporting rate, and the majority (78.9) ofincidence was not reported, Needle stick and sharp injury had highly significant associated with each experience year and work department.

Recommendations:

Study recommended that Regular courses and seminars should be conducted for needle stick and sharp injury prevention and management, activate the role of infection control unit and reporting needle stick injury should be priority, full vaccination of nurse`s is mandatory .

Table of contents

List of tables

List of Figures

1.1Introduction

Needle-stick and Sharp Injuries are accidental skin penetrating wounds caused by sharp instruments in a medical setting. They are defined as an accidental skin penetrating wound caused by hollow-bore needles such as hypodermic needles, blood-collection needles, Intra-venous (IV) catheter styles, and needles used to connect parts of IV delivery system, scalpels and broken glass.**(Anjum Hashmi,{etal},2012) .**

Healthcare Workers face a high risk of an occupational exposure to blood, which can lead to the transmission of pathogens causing an infection and resulting in hazardous consequences for their health. Hepatitis B, Hepatitis C, and Human Immunodeficiency Virus (HIV) are of utmost concern because they can cause significant morbidity or death. The common high risk situation of such an occupational exposure is percutaneous injury which is a high risk injury. **(Anjum Hashmi,{etal},2012).)**

An investigation estimates that needle-stick and sharps injuries affect about 3.5 million individuals on the global level. In healthcare workers nurses and physicians appear especially at risk. There can be serious consequences of needle stick injuries in hospitals as large proportion of injuries involves used needles and sharps if health care workers do not take appropriate measures of protection. **(Anjum Hashmi,{etal},2012).**

Needle stick injuries are occupational hazard in medical community. It`s the most common health care workers issue, these injuries are not only causing health consequences but also cause emotional distress in health care workers which results in missed workdays and directly affects the health care services and resources, Most of the injuries occur due to three basic devices. Intravenous equipment, sutures needles and hollow bore needles. But for surgical personals and for perioperative nurses, sutures needles are most common equipment that causes injuries. Other

most important causes of NSI are two-handed recapping, the unsafe collection and disposal of sharps waste. During surgery percutaneous injuries occur regularly due to which patient are at high risk of infection with blood borne pathogens. The majority of gloves tears have an unknown mechanism that leads sharp injury, causes to transmit Blood borne pathogens in operating room. Needles should not recap after use because it can lead to an injury to health care providers. **(Najma Rais & Hafiza Mubashira Jamil, 2013).**

According to the International Labor Organization all appropriate measures should be taken to prevent, reduce or eliminate risks to the health of nursing personnel. This includes: A comprehensive national policy on occupational health; The establishment of occupational health services; Access to health surveillance, preferably during working hours and at no cost to the worker concerned; Medical confidentiality of health surveillance; Financial compensation for those exposed to special risks; Participation in all aspects of protection provisions. **(Nursing matters, 2000)**

Health care workers are frequently exposed to infectious diseases. Sharps injuries are one of the most serious occupational accidents among nurses due to the possible severe consequences, such as the transmission of infectious diseases. Nurses were most likely to have needle stick injuries among health care workers. Reporting sharps injuries is important as it leads to sharing of the causes of the injuries and subsequent prevention of those accidents. **(Honda, {etal}2011)**

Proper work environment might decrease the number of sharps injuries. Safe disposal boxes should be provided in all patient rooms and clinical settings. Advanced hospitals have tried to improve their hospital safety climates by providing nurses and head nurses with continuous education, focusing on improving individual nursing skills, managing reporting systems for sharps injuries, applying Universal Precautions guidelines, and setting adequate workloads for nurses. Nurse attitudes towards sharps injuries prevention and occurrence of sharps injuries are important. **(Honda, {etal}2011)**

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1.2. Rational

Percutaneous exposure to contaminated needle sticks and other sharps is an occupational hazard to nurses that causes morbidity and mortality from infections with blood borne pathogens. **(Iram Manzoor et al ,2010)**

Health care workers such as medical doctors, nurses and laboratory staff are frequently exposed to infectious diseases especially hepatitis B , hepatitis C virus and human immune deficiency virus through job-related risk factors like needle stick, stab, scratch, cut, or other bloody injuries. Needle stick injuries can be prevented by safer devices. Some infectious diseases have no available vaccination or complete treatment, so blood-borne infections are a major cause of anxiety for Health care workers. **(Honda, {etal} 2011)**

An investigation estimates that needle-stick and sharps injuries affect about 3.5 million individuals on the global level. In healthcare workers nurses and physicians appear especially at risk. There can be serious consequences of needle stick injuries in hospitals as large proportion of injuries involves used needles and sharps if health care workers do not take appropriate measures of protection. **(Anjum Hashmi et al},2012)**

Sudan is one of developing countries that have lack of requirement of infection control in hospitals .The needle stick and sharp injury prevention need more precautions and facilities to prevent nurse`s from infectious disease, this study conducted to assess and determine factors and commonest clinical activity with lead to increase frequency of injuries and lead to many blood transmission disease.

Objectives

General objective:-

To assess prevalence of needle sticks and sharp injuries among nurse`s.

Specific objectives:

1. To assess the frequency and associated with needle stick injury in nurses
2. To identify commonest clinical activity, items, and risk factor caused needle stick injury.
3. To assess measures that taken by nurses after injury.
4. To identify nurse’s awareness about preventative measures for needle stick injury and infection control.

2. Literature review

2.1. Background:

Infection prevention and control is the clinical application of microbiology in practice or disease may be caused by different groups of micro-organisms such as bacteria, fungi, viruses or prions and can result in a wide variety of infections that include, for example, urinary tract, wound, respiratory, blood, bone and skin infections. **(Liz Evans et al, 2012).**

Health and social care settings can provide a challenging environment in which to manage risks associated with the transfer of micro-organisms from patient to patient or between the environment, equipment, staff and patients. Vulnerable patients, opportunist pathogens, and the intensity and complexity of health care interventions mean that vigilance is required at all times. **(Liz Evans et al, 2012).**

Health care workers are frequently exposed to infectious diseases. Sharps injuries are one of the most serious occupational accidents among nurses due to the possible severe consequences, such as the transmission of infectious diseases. Nurses were most likely to have needle stick injuries among health care workers. **(Honda et al, 2011).**

Staff nurses play an important role in risk reduction by paying careful attention to hand hygiene, by ensuring careful administration of prescribed antibiotics, and by following procedures to reduce the risks associated with patient care devices .**(Smeltzer et al,2003)**Standard precautions (formerly known as universal precautions) underpin routine safe practice, protecting both staff and clients from infection. By applying standard precautions at all times and to all patients, best practice becomes second nature and the risks of infection are minimised. **(Liz Evans et al, 2005).**

The frequency of such events has been estimated to be about 800,000 Cases in the United State of America alone].Another investigation

estimates the rates of injuries on a global level to affect about 3.5 million individuals ,among healthcare worker nurses and physicians appear especially at risk (**Anjum Hashmi et al,2012)**.

In Saudi Arabia Needle Stick and Sharp-Object Injury Report have been compiled using the data from 21 facilities from January 1st to March 31st, 2012. According to this report, nurses are the Primary injured staff, totalling 66.4%, as compared to 7.8% of which are physicians. The primary locations where these injuries occur are in the patient room (48.9%), the Emergency Department (13.6%) and the Operating/Recovery Room (11.5%). 89.3% of the sharp items involved
In the injuries are contaminated. Most of the injuries occur during injections (17.9%), drawing of venous blood samples (17.2%), and suturing (14.8%). 41.9% of the time the injuries occur during the use of the sharp items, while 18.6% are injured after use, but before disposal.
The principal devices causing the injuries are disposable syringes (57.1%), 64.4% of the time they are not "safety devices". Injuries primarily occur to the hands of the staff. 68.3% of sharps penetrated when the staff wore a single pair of gloves, 26.9% wore no gloves at all, and 4.8% wore a double pair of gloves, which may have reduced the overall penetration of the sharps. (**Anjum Hashmi et al, 2012)**

In 2009, a research project was conducted in Delhi to assess the knowledge and practices of staff nurses regarding needle stick and sharp injury and to evaluate the effectiveness of guidelines developed for the prevention and management of needle stick and sharp injury in a selected Delhi government hospital. The study showed that 70% of nurses had experienced needle stick injuries. Of these, the majority (71%) did not report the incident. There was lack of awareness among staff nurses regarding preventive behaviour, especially the importance of reporting

needle stick and sharp injury. Reporting is important as it leads to sharing of the causes of the injuries and subsequent prevention of those accidents. **(Honda et al, 2011)**

2.2. Principles of infection prevention and control (standard precautions):

Standard precautions (formerly known as universal precautions) underpin routine safe practice, protecting both staff and clients from infection. By applying standard precautions at all times and to all patients, best practice becomes second nature and the risks of infection is minimised. They include

2.2.1. Achieving optimum hand hygiene:

Hand hygiene is widely acknowledged to be the single most important activity for reducing the spread of disease, yet evidence suggests that many health care professionals do not decontaminate their hands as

Often as they need to or use the correct technique which means that areas of the hands can be missed. **(ducel et al ,2002)**

2.2.2. Using personal protective equipment:

Personal protective equipment is used to protect both yourself and your patient from the risks of cross-infection. It may also be required for contact with hazardous chemicals and some pharmaceuticals. Personal protective equipment includes items like gloves, aprons, masks, goggles or visors. In certain situations such as theatre, it may also include hats and footwear. **(ducel et al ,2002).**

Proper usage, wear, and removal of personal protective measure are important to provide maximum protection to the health care worker. However, personal protective equipment may not be 100 present protective, individual work practices may lead to exposure (e.g., needle stick injury), breaches in personal protective equipment might occur, and

some breaches may go unrecognized. **(ducel et al ,2002)** ·All personal protective measure should be removed when leaving the patient care area, Gloves prevent gross contamination of the hands when touching body fluids, reduce the likelihood that microorganisms present on the hands of personnel will be transmitted to patients during invasive or other patient care procedures, and reduce the likelihood that hands of personnel contaminated with microorganisms from a patient or a fomite can transmit these microorganisms to another Patient . **(hoghes ,2008)**

2.2.3. Safe handling and disposal of sharps:

Sharps include needles, scalpels, stitch cutters, glass ampoules and any sharp instrument. The main hazards of a sharps injury are hepatitis B, hepatitis C and HIV. Second only to back injuries as a cause of occupational injuries amongst health care workers, between July 1997 and June 2002, there were 1,550 reports of blood-borne virus exposures in health care workers – of which 42 per cent were nurses or mid wives. **(ducel et al,2002)**

To reduce the risk of injury and exposure to blood borne viruses, it is vital that sharps are used safely and disposed of carefully, following your workplace's agreed policies on safe working procedures. Your employer should provide targeted education and awareness training for all health care workers. Some procedures have a higher than average risk of causing injury. These include intra-vascular canulation, venepuncture and injection**.** **(ducel et al,2002)**

Devices involved in these high-risk procedures are IV cannula ، winged steel butterfly needles، needles and syringes phlebotomy needles.

You should ensure that:

- ❖ Sharps are not passed directly from hand to hand.
- ❖ Handling is kept to a minimum.
- ❖ Needles are not broken or bent before use or Disposal

- ❖ Syringes or needles are not dismantled by hand and are disposed of as a single unit.
- ❖ Needles are never re-sheathed.
- ❖ Staffs take personal responsibility for any sharps they use and dispose of them in a designated Container at the point of use.
- ❖ Sharps containers are not filled by more than two thirds and are stored in an area away from the Public.
- ❖ Sharps trays with integral sharps bins are in use sharps are disposed of at the point of use sharps boxes are signed on assembly and disposal sharps are stored safely away from the public and out of reach of children.
- ❖ Staffs are aware of inoculation injury policy. **(ducel et al,2002)**

2.2.4. Safe handling and disposal of chemical waste:

Your workplace should have a written policy on waste disposal, which provides guidance on all aspects, including special waste, like pharmaceuticals and cytotoxic waste, segregation of waste and an audit trail **(ducel et al, 2002).**

This should include colour coding of bags used for waste.

All health care and support staff should be instructed in the safe handling of waste, including disposal and dealing with spillages. Trusts should consider systems for segregating waste that can be recycled. **(ducel et al,2002)**

2.2.5. Appropriate use of indwelling devices:

Make sure you use the correct technique when using indwelling devices as it is vital to reduce the risk of patients acquiring infection. 80 per cent of urinary infections can be traced back to indwelling urinary catheters. These infections arise because catheters traumatise the urethra as well as providing a pathway for bacteria and other organisms to enter the bladder.

The longer such catheters are in place, the higher the risk of infection. **(ducel et al,2002)**

2.2.6. Managing accidental exposure to blood-borne virus:

Every health care worker who sustains a needle stick injury should have access to post-exposure prophylaxis, as appropriate, within hours of the injury, along with counselling, confidential testing, and follow-up. Failure to report needle stick injury may compromise appropriate post-exposure management, including post exposure prophylaxis for human immune deviancy IV and hepatitis B virus, and assessment of occupational hazards and preventive interventions. The absence of post exposure prophylaxis, lack of knowledge of the efficacy of post exposure prophylaxis for prevention, an attitude that health care workers are careless or to blame for their own injuries, and lack of follow-up and workers' compensation are all reasons health care workers do not report injuries. (**(Liz Evans et al, 2012).**

The risk of contracting hepatitis B virus from needle stick exposure in a health care setting is much higher than human immune deviancy because the virus is both more infectious and has greater prevalence. As a result, the Royall College of nursing recommends that all nurses should be vaccinated against hepatitis B with monitoring of antibody titre levels and boosters, where inoculation injury occurs and titres are low. Staff should take responsibility for this and should contact the occupational health department if there are any concerns (**(Liz Evans et al, 2012).**

2.2.7. Proper Cleaning and Disinfection of the Environment and Equipment:

Routine Practices also includes the concept that contaminated surfaces and equipment can be the source of microorganisms. Because of this, appropriate cleaning and disinfection of both the health care environment

and equipment used for care is recommended. Transmission of microorganisms has also been linked to improperly cleaned and disinfected equipment **(Susan and Gerry, 2004)**

2.2.8. Training:

All health care professionals who have a clinical responsibility for patients must include infection prevention and control as part of their everyday practice .The Royall College of nursing believes all health care staff should receive mandatory infection control training as part of their induction and on-going annual basis. It is particularly important that knowledge and skills are continually updated. **(Liz Evans et al, 2005)**

The training should cover all the general principles of infection prevention and control, to emphasise the key role that health care professionals play in minimising the spread of infection; to highlight what can happen as a result of bad practice and underline the importance of good communication. **(Liz Evans et al, 2005)**

2.3. Infection control responsibility:

2.3.1. Role of hospital management:

The administration and/or medical management of the hospital must provide leadership by supporting the hospital infection programme. They are responsible for:

- Establishing a multidisciplinary Infection Control Committee.
- Identifying appropriate resources for a programme to monitor infections and apply the most appropriate methods for preventing infection.
- Ensuring education and training of all staff through support of programmes on the prevention of infection in disinfection and sterilization techniques.

- Delegating technical aspects of hospital hygiene to appropriate staff, such as: nursing ،housekeeping maintenance ،clinical microbiology laboratory.
- Periodically reviewing the status of nosocomial infections and effectiveness of interventions to contain them.
- Reviewing, approving, and implementing policies approved by the Infection Control Committee.
- Ensuring the infection control team has authority to facilitate appropriate programme function. And participating in outbreak investigation.[(ducel et al,2002)]

2.3.2. Role of the nursing staff:

Implementation of patient care practices for infection control is the role of the nursing staff. Nurses should be familiar with practices to prevent the occurrence and spread of infection, and maintain appropriate practices for all patients throughout the duration of their hospital stay.

2.3.2.1. Responsibility of administrator nurse:

- Participating in the Infection Control Committee.
- Promoting the development and improvement of nursing techniques, and on-going review of aseptic nursing policies, with approval by the Infection Control Committee.
- Developing training programmes for members of the nursing staff.
- Supervising the implementation of techniques for the prevention of infections in specialized areas such as the operating suite, the intensive care unit, the maternity unit and new-borns.[(ducel et al,2002)]

2.3.2.2. Role of nurse in award:

- maintaining hygiene, consistent with hospital policies and good nursing practice on the ward
- monitoring aseptic techniques, including hand washing and use of isolation

- Reporting promptly to the attending physician any evidence of infection in patients under the nurse's care.
- initiating patient isolation and ordering culture specimens from any patient showing signs of a communicable disease, when the physician is not immediately available
- Limiting patient exposure to infections from visitors, hospital staff, other patients, or equipment used for diagnosis or treatment.
- Maintaining a safe and adequate supply drugs and patient care supplies.**(ducel et al,2002)**

2.3.2.3. Infection Control Nurse :

An Infection Control Nurse or Practitioner is a registered nurse with an additional academic education and practical training which enables him or her to act as a specialist advisor in all matters relating to infection control. A recognized qualification in infection control should be held which will allow recognition of the infection control nurse as a specialist practitioner **(Damani, 2008)**.

The infection control nurse is usually the only full-time practitioner in the infection control tame and therefore takes the key role in day-to-day infection control activities, with the infection control doctor providing the lead role. It is recommended that on Infection Control Nurse is required for every occupied bed. The role and responsibility of the infection control nurse is summarized as follows:

- Serves as a specialist advisor and takes a leading role in the effective functioning of the infection control team.
- Should be an active member of the hospital infection control committee.
- Assists the hospital infection control committee in drawing up annual plans and policies for infection control.

- Provides specialist nursing input in the identification, prevention, monitoring, and control of infection within the hospital.
- Participate in surveillance, investigation, and control of infection in the hospital.
- Identify, investigate and monitor infections, hazardous practice and procedures.
- Advice to the contracting departments, participating in the preparation of documents relating to service specifications and quality standards.
- On-going contribution to the development and implementation of infection control policy and procedure, participating in audit, and monitoring tools related to infection control and infectious diseases.
- Presentation of educational programmes and membership of relevant committees where infection control input is required is essential that the infection control nurse should have an expert knowledge of both general and specialist nursing practice and must also have an understanding not only of the functioning of clinical areas but also operational areas and services. He or she must also be able to communicate effectively with all grades of staff, negotiate and effect change and influence practice. **(Damani, 2008)**.

2.4. work-related blood borne pathogen exposure (the risks for health care workers):

Every day, health care workers are exposed to dangerous and deadly blood borne pathogens through contaminated needle sticks, sharps, or splash exposures. It is one of the greatest risks faced by the frontline health care worker. Every percutaneous needle stick and sharps injury carries a risk of infection from blood borne pathogens. Yet, these

exposures often have been considered “part of the job.” Health care’s workers primarily are exposed to these pathogens via contaminated needle stick and sharps injuries. **. (ducel et al,2002).**

Registered nurses working at the bedside sustain an over whelming majority of these injuries. These exposures carry the risk of infection with Hepatitis B , Hepatitis C , and Human Immunodeficiency Virus the virus that causes AIDS**.(ducel et al,2002).**

2.4.1. Needle stick and Sharp injuries:

Needle stick injuries are the most common of sharps injuries, although other contaminated sharp instruments may also cause injuries. All health care Workers with potential exposure should be vaccinated. For other personnel, the risk of hepatitis B, hepatitis C and human immunode deviancy virus infection should be assessed and appropriate immunization or chemo prophylactic steps taken. **. (ducel et al,2002).**

Immediate treatment of such injuries should encourage washing thoroughly with running water and an antiseptic solution. Consult the infection control team for further advice. An incident reporting system should be in place. It should not be seen as punitive; active support by managers should encourage prompt and accurate reporting. **.(ducel et al,2002).**

2.4.2. Determinants of needle stick injury:

- Overuse of injections and unnecessary sharps.
- Lack of supplies: disposable syringes, safer needle devices, and sharps-disposal containers.
- Lack of access to and failure to use sharps containers immediately after injection.
- Inadequate or short staffing ،Recapping of needles after use.
- Lack of engineering controls such as safer needle devices.
- Passing instruments from hand to hand in the operating Suite.

- Lack of awareness of hazard and lack of training (**Susan and Gerry 2004**)

2.4.3. Exposure to human immunodeficiency virus:

The route of transmission for human immune deviancy virus is person to person via sexual contact, sharing of needles contaminated with human immune deviancy, infusions that are contaminated with human immune deviancy, transplantation of organs or tissues that are infected with HIV. **(ducel et al, 2002**)

The risk of a health care worker acquiring human immune deviancy after a needle stick or other "sharps" injury is less than 0.5%.11 Risks reduction must be undertaken for all blood borne pathogens, including: adherence to standard precautions using personal protective equipment and appropriate use of safety devices and a needle disposal system to limit sharps exposure. Training for health care workers in safe sharps practice should be on-going. **(ducel et al, 2002**)

Information on preventive measures must be provided to all staff with potential exposure to blood and blood products. Policies which are in keeping with the local and national guidelines must include screening of patients, disposal of sharps and wastes, protective clothing, managing inoculation accidents, sterilization and disinfection. Hospital policy must include measures to obtain serological testing of source patients promptly where necessary, usually with the patient's informed consent. Post exposure prophylaxis should be started as per local or national guideline **(ducel et al, 2002**).

2.4.4. Exposure to hepatitis B virus:

The route of transmission for hepatitis B virus is through body substances such as blood and blood products, saliva, cerebrospinal fluid, peritoneal, pleural, pericardial and synovial fluid, amniotic fluid, semen and vaginal secretions and any other body fluid containing blood.

Following standard precautions is important, but immunization is the best way of preventing transmission to health care staff. Staff infected with blood-borne pathogens may transmit these infections to patients and require careful evaluation with respect to their duties. This status should not be used as cause for discrimination. **(ducel et al, 2002)**

2.4.5. Exposure to hepatitis C virus:

The route of infection is mainly parenteral. Sexual transmission does occur but is far less frequent. No post exposure therapy is available for hepatitis C, but seroconversion (if any) must be documented. As for hepatitis B viral infection, the source person must be tested for HCV infection. For any occupational exposure to blood borne pathogens, counselling and appropriate clinical and serological follow-up must be provided **(ducel et al, 2002)**.

2.4.6. Determinants of Transmission of Infection:

The risks of transmission of infection from an infected to the health care worker following a needle stick injury are: Hepatitis B 3–10% ،Hepatitis C 3%، HIV 0.3% Factors that increased risks of transmission of HIV Include a deep wound, visible blood on the device, ahollow bore blood fill need use of the device to access an artery or vein, and high-viral-load status of the patient.**(Susan and Gerry 2004)**

2.4.7. Immediate action after sustained needle sticks injury.

- Wash the wound with soap and water.
- Alert your supervisor and initiate the injury reporting system used in your workplace.
- Identify the source patient, who should be tested for HIV, hepatitis B, and hepatitis C infections. Your workplace will begin the process to test the patient by seeking consent.

- Report to employee health services, the emergency department, or other designated treatment facility.
- Get tested immediately and confidentially for HIV, hepatitis B, and hepatitis C infections**.**
- Get post exposures prophylaxis in accordance with Centres for Disease Control and Prevention guidelines when the source patient is unknown or tests positive for:

✓ **HIV**: Start prophylaxis within two hours of exposure.

✓ **Hepatitis B**: If vaccinated no treatment, but if unvaccinated get HBIG and initiate HB vaccine series.

✓ **Hepatitis C:** No treatment is currently recommended, but you may want to consult specialist about experimental post exposures prophylaxis.

- Document the exposure in detail, for your own records as well as for the employer and for workers' compensation. Under the new needle stick law, employers must maintain a confidential sharps injury log that contains, at a minimum, the type and brand of device involved in the incident, the department or work area where the exposure incident occurred, and an explanation of how the incident occurred. **(Americana nursing association, 2002).**

Follow-Up:

- Get confidential follow-up, post-exposure testing at six weeks, three months, and six months, and depending on the risk, at one year.
- Receive monitoring and follow-up of post exposures prophylaxis.
- Take precautions (especially by practicing safe sex) to prevent exposing others until follow-up testing is complete.(**ducel et al, 2002**)

2.5. Control measures to prevent needle stick injury and blood borne pathogens:

While exposure to blood borne pathogens is one of the deadly hazards that nurses face on a daily basis, it is also one of the most preventable. Over 80% of needle stick injuries can be prevented with the use of safe needle devices, 26 which, in conjunction with worker education and work practice controls, can reduce injuries by over 90 % **(Americana nursing association2002).**

Control measures to prevent blood borne pathogens following the traditional hierarchy of controls from most effective to least effective include:

2.5.1. Elimination of hazard—substitutes:

Injections by administering medications through another route, such as tablet, inhaler, or transdermal patches, for example. Remove sharps and needles and eliminate all unnecessary injections. Jet injectors may substitute for syringes and needles. Other examples include the elimination of unnecessary sharps such as towel clips and using needleless intravenous (IV) systems. **(Susan and Gerry, 2004)**

2.5.2. Work practice controls.

Examples include no re-capping, placing sharps containers at eye level and at arms' reach, checking sharps containers on a schedule and emptying them before they're full, and establishing the means for safe handling and disposing of sharps devices before beginning a procedure **(Susan and Gerry, 2004)**

2.5.3. Administrative controls:

Policies and training programs aimed to limit exposure to the hazard. Examples include Universal Precautions allocation of resources demonstrating a commitment to health care worker safety, a needle stick prevention committee, an exposure control plan, and consistent training **(Susan and Gerry, 2004)**

2.6. Nursing precaution:

The Most common procedures within health services that puncture the skin – including: injections of various types, phlebotomy, lancet procedures and common intravenous procedures such as infusions. It is important to note that some people reserve the word injection for a procedure in which a medication, vaccine or other is deposited into to a patient, while other people use the word injection in a more general sense that includes needle insertions either to deposit these types of fluids into a patient or withdraw blood or other bodily fluids. **(WHO, 2008).**

2.6.1. Best Infection Control Practices for injections, phlebotomy, lancet procedures and intravenous injections or infusions:

2.6.1.1. Use sterile devices:

1. Use a new sterile single-use device for each procedure.
2. Use a new sterile single-use syringe and needle to reconstitute each unit of medication or vaccine.
3. Inspect packaging of devices for breaches in barrier integrity. Discard any device if the package has been punctured, torn, or damaged by exposure to moisture or if the manufacturer's expiration date has already passed.
4. Maintain an adequate supply of single-use devices to enable providers to use new devices each time they perform a procedure. **(WHO 2008).**

2.6.1.2. Prevent contamination of devices, medication and fluids for infusion.

1. Prepare procedures in a clean, dedicated table or tray where contamination of the equipment with blood, body fluids or dirty swabs is unlikely.
2. Never leave a needle in place in the stopper of the vial.
3. Use single-dose vials rather than multi-dose vials whenever possible.
4. If multi-dose vials must be used, always pierce the septum with a sterile needle.
5. Select pop-open ampoules rather than ampoules that require use of a metal file to open whenever possible.
6. In all cases, protect fingers with a clean barrier (e.g., small gauze pad) when opening the ampoule.
7. Inspect for and discard medications and fluids for infusion with visible contamination (e.g., cloudy) or breaches of integrity (e.g., cracks, leaks) or which are expired.
8. Follow product-specific recommendations for use, storage (including maintenance of the cold chain where needed), and handling.
9. Discard a needle that has touched any non-sterile surface.
10. Ensure that reusable phlebotomy holder-adapters used for performing phlebotomies are clean.**(WHO 2008)**

2.6.1.3. Prevent needle stick and other used sharps injuries to the provider:

a. Anticipate and take measures to prevent sudden patient movement during and after performing a procedure.
b. Avoid recapping and other hand manipulations of needles. If recapping is necessary (e.g., if performing a procedure in a situation

in which sudden patient movement is possible and not totally preventable), use a single-handed scoop technique for recapping.

c. Collect used sharps at the point of use in a sharps container that is puncture and leak proof and that can be sealed-shut when ¾ full.
d. Maintain an adequate supply of sharps containers that are puncture and leak-proof to enable providers to always have a sharps container available when they perform a procedure.**(WHO 2008)**

2.6.1.4. Prevent access to used devices:

1. Seal sharps containers and containers for infectious non-sharps waste for transport to a secure area in preparation for disposal. After closing and sealing these containers, do not open, empty, reuse, or sell them.
2. Manage sharps waste and infectious non-sharps waste in an efficient, safe, and environmentally friendly way to protect people from voluntary and accidental exposure to used devices including ensuring that there are no loose, used devices anywhere inside or outside the facility or in open or overflowing sharps containers or infectious non sharps waste containers.**(WHO 2008)**

2.7. Measures to protect Hhealth care worker:

Protection of health care workers should be an integral part of the Health and Safety programme of health care establishments; Health care facilities have a responsibility to ensure that all reasonably practicable steps are taken to ensure that the risk of infection to health workers is minimized. Transmissible infections in health care worker must be identified quickly so that they can be excluded from the work place or from direct patient contact until they are no longer infectious. **(damani, 2008)**

2.7.1. Measures to protect health care workers from infection fall mainly into three categories:

1. Immunization: All Health care workers should be immunized against vaccine-preventable diseases.

2. Educational and training

All health care workers must be provided with appropriate training and education in infection control as part of their orientation. This must be reinforced through a regular continuing education programme. They should be trained in the handling of blood and body fluids, chemical disinfectants and should be aware of local policies and procedures on infection control including waste disposal, dealing with contaminated Sharps, etc. They should also be provided with appropriate personal protective equipment. Work practices should be developed and implemented to ensure compliance with infection control policies and procedure. **(Damani, 2008)**

3. Reporting

Heath care workers must report any accidents or illness to their line manager and, if appropriate, to the occupational health department. In addition, the incident report process includes notes on remedial and follow-up action taken before the process is considered complete. **(Damani, 2008)**

2.8. European Directive on the prevention of sharps injuries:

In May 2013 a new European Directive will come into force in the UK, requiring employers to assess the risks of sharps injuries and where possible eliminate the use of sharps – for example, through the use of needleless systems. Where sharps cannot be eliminated, steps should be taken to reduce the risk of injuries through the use of safety

engineered sharps devices. Clinical staff and their representatives should be involved in the selection and evaluation of such devices. The directive will apply to all workers in the hospital and health care sector including those working in the private and public sector. **(Liz Evans et al, 2012)**

2.8.1 Underlying principles of the directive:

There are a number of underlying principles which need to be applied to ensure the effective implementation of the directive. These include:

a. the prevention of exposure to sharps to be a priority
b. The need for a well-trained, adequately resourced and secure (in other words, confident and competent) health service workforce
c. In accordance with their training, workers take care, as far as possible, for their own health and safety and that of other persons affected by their actions.
d. Never assume there is no risk of exposure to blood borne viruses following a sharps injury.
e. Acknowledge the important role of safety representatives in sharps injury prevention and the development of health and safety policies and practices in the workplace.
f. the importance of partnership working between key stakeholders - including infection prevention specialists, occupational health, health and safety, and procurement supplies and consultation with workers and their representatives on safe systems of work, selection of safety equipment and how best to carry out training, information and awareness raising. **(Liz Evans et al,2012).**

3. Methodology

3.1. Study design:-

This was Descriptive, hospital-based study, done to assess the prevalence of needle stick and sharp injuries among nurses working in ElMak Nemir University hospital.

3.2. Study time:-

This study was done during the period which extended from July to November 2014.

3.3. Study area:

This study was done in Shendi city, river Nile state, Sudan, which located in the north of Khartoum about 176 Km, it`s population about 80000 persons (WHO 2003) most of them are farmers.

Shendi city now is one of the rich cities in health care facilities; it contains three main hospitals, ElMak Nemir University hospital. , Shendi teaching hospital and military hospital, and also there is hosh bannaga hospital and elmiseiktab hospital.

3.4. Setting:-

This study was carried out at ElMak Nemir University hospital. This hospital was established since 2002. And it's the second university hospital in Sudan. The hospital provides most types of medical services (medicine, surgery, Obs/Gyne, and pediatric). Beside these there are cardiac, renal, and oncology centers). In the hospital there is a big theater

complex in which most type general operations can be done (caesarean, GIT surgery and orthopedic surgery …etc.)

There was an outpatient clinic in the hospital established science 2009. The hospital system for work , for nursing staff , morning shift for 8 hours in duration, and afternoon , evening shift for 16 hours, and is the distribution of nursing staff according to need of hospital departments ,nurses they will rotated frequently without fixed intervals according to the need.

3.5. Study population:-

Include all nurses whom working in the hospital during the three shift, during the time of study, and excluded nurses in holy day.

3.6. Sampling & Sample size:-

The study was covered all nursing staff in ElMak Nemir University hospital, and they were 120, various certificates of diploma, bachelor and master in nursing science.

3.7. Data collection tools:

standard closed ended questioner was developed by researcher، based on the Literature review composed of 18 questions, questions from (1-3) personal data,(4-13) regarding needle stick injury, include (nurses have sustained a needle stick injury ,times of injury, timing of activity ,items of injury and reporting of needle stick injury (14-16) about nurses action after injury and knowledge regarding preventive measures .(17-18) about vaccination against HBV ,and nurses vision status.

Knowledge scale system:

The knowledge section comprised question about nurse `s knowledge about prevention of needle stick injury and measure to infection control, the knowledge parte was measuring by using 4 categorise:

A: ″ knowledgeable": for full answer.

B:"satiesfed knowledge" for more than two third of answer

C: ***″unsatisfied knowledge***"if the score was half of the total answer.

D: ″poor knowledge ″" if the score was less than half of from the total answer.

3.8. Data collection technique:

The data was collected during three weak daily during three shift, the nurses were allowed to filled questioner by them self, it takes about (5-8) minutes, no once refuse to participate and there was no missing.

3.9. Data analysis:

The data was coded and analysed manually, then by SPSS program version (11.5) by using statistical measure; - percentage, frequency, standard deviation and chi squire test and presented in forms of tables and figures, the statistical significant *p* value was (0.05).

3.10. Ethical consideration:-

The proposal was approved from the scientific committee board, and then permission was taken from general hospital manger and the head nurse to conduct the research.

The purpose of the study has been explained verbally clearly to participant and their information should be used for the purpose of study only and there have chance to continuous, or stopped at any time they wish.

4. Result

The results were presented into the following sequences:-

Section I: frequency and distribution of the study population according to their general characteristics and Scio - demographic data.

Section II: - the study group distributions according to their knowledge and practice.

Section III:-Correlations and comparisons between variables of the study group (level of education, site of work, and years of experience and their knowledge and practice.

N=120

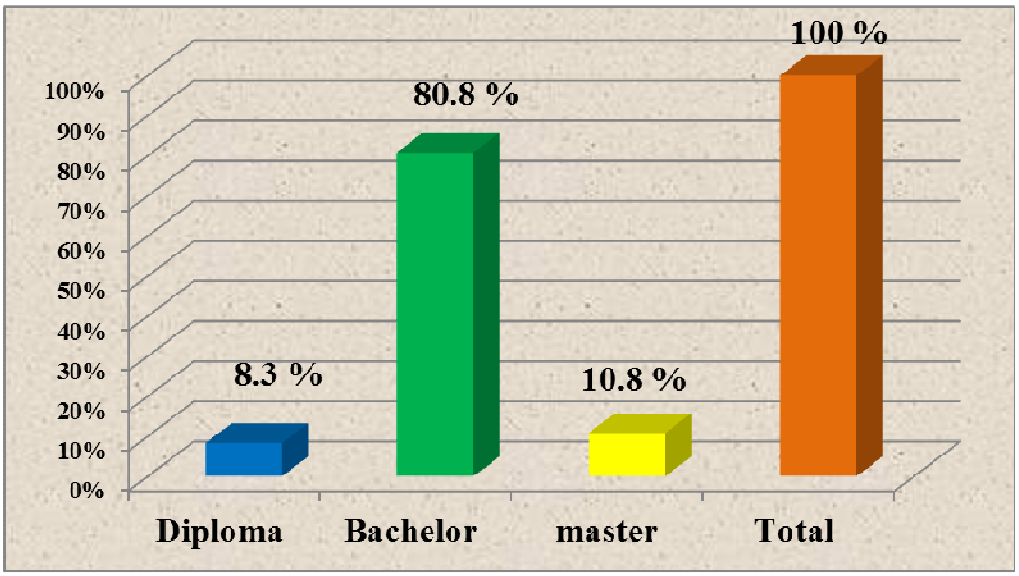

Figure No (1): the distribution of nurse's according to their level of education.

The figure showed that, (80.8%) of nurse's have bachelor, (10.8%) have master degree and (8.3%), have diploma.

N=120

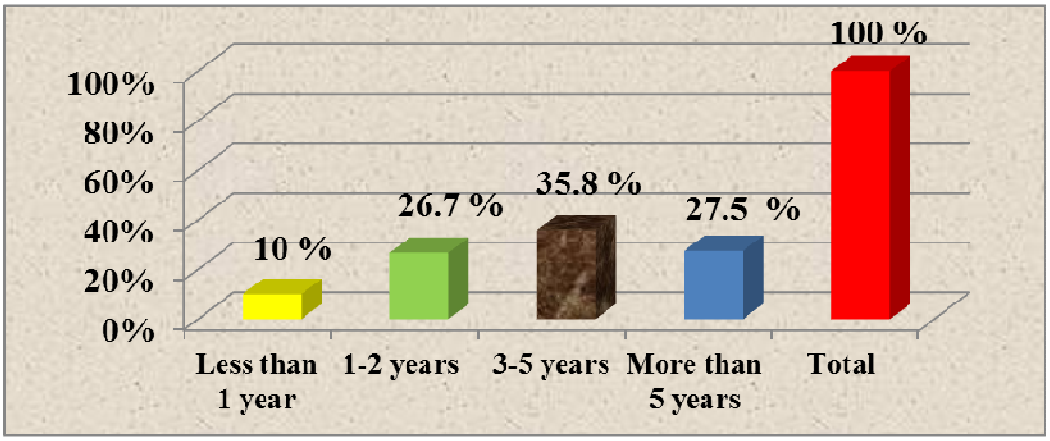

Figure No (2) distribution of nurse's according to experience years.

The figure showed that (35.8%)of nurse`s have( 3-5 )years ,(27.5%)have more than three years ,(26.7%)have (1-2)years and (10%)of nurse`s have less than years .

N=120

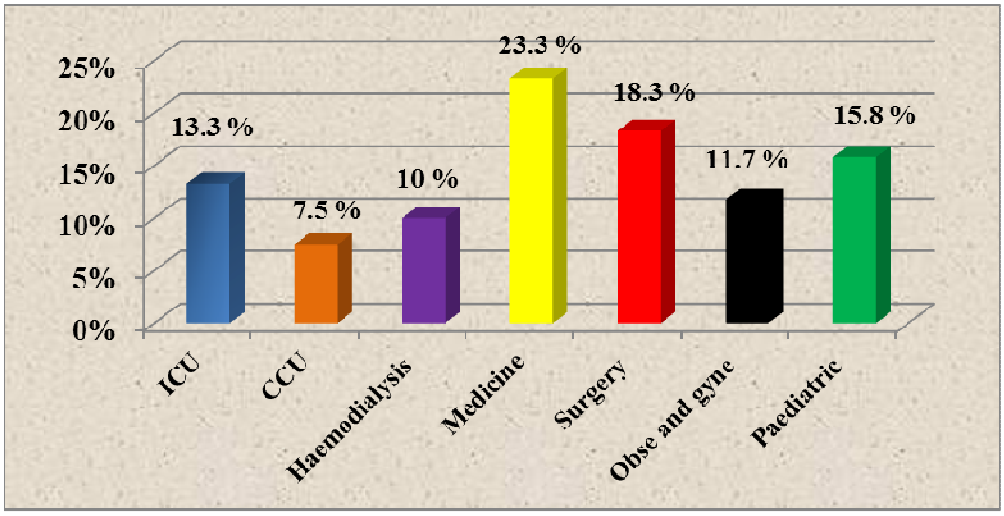

Figure NO (3) the distribution of nurse's according to their work department.

The figure showed that (13.3%)of nurse`s working in ICU(7.5%)in CCU,(10.0%)in haemodialysis canter ,(23.3%)in medicine ,(18.3%)in surgery (11.7%)in obs\gyne and(15.5) in paediatric department.

N=120

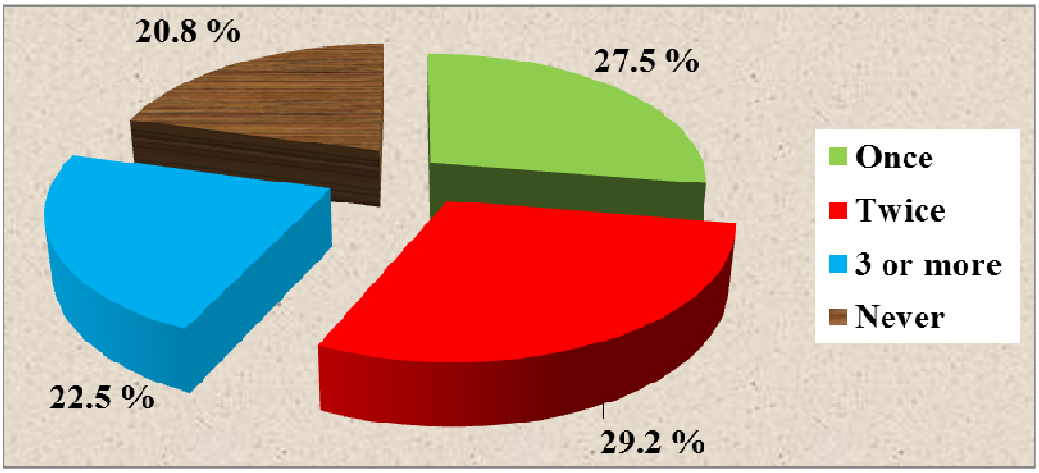

Figure NO (4): the distribution of nurse`s according to their Frequency of exposure to needle stick injuries.

The figure showed that (27.5%) of nurse`s have sustained once time, (29.2%) twice, (22.5%) sustained more than 3 times, and (25%) of nurse`s not sustained to needle stick injury.

N=120

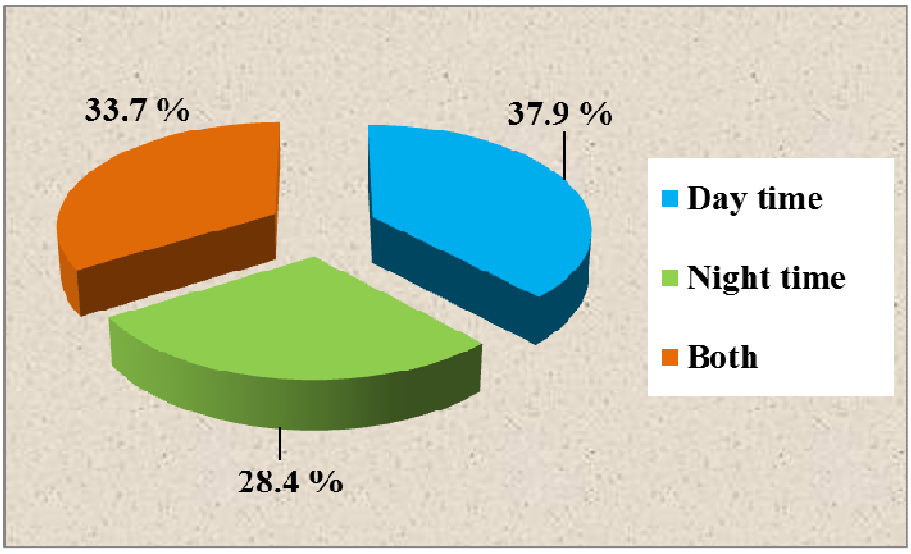

Figure NO (5): the distribution of nurse`s according to timing of exposure to needle stick injury.

The figure showed that (37.9%) of nurse`s had exposure to needle stick injury at day time, (28.4%) at night time and (33.7%) of nurse`s during the both time (day and night).

Table NO (1): nurses comment about availability of sharp box in work area during exposure.

N=120

Availability	***Frequency***	***Percentage***
Available	53	55.8%
Not available	31	32.6%
Not sure	11	11.6%
Total	95	100%

The above table showed that more than half (55.8%) of nurse`s commented the sharp box available during needle stick injury occurred, (32.6%) commented sharp box not available, and (11.6%) ware not sure about availability of sharp box during sustained needle stick injury.

Table NO (2): the distribution of nurse`s according to injury report.

N=120

Actions	*Frequency*	*Percentage*
Fill report	4	4.2%
No action	75	78.9%
Verbal report	16	16.8%
Total	95	100%

The above table showed that most (78, 9%) did not reported their injured, (16.8%) of nurses reported their injury verbally, and just (4.2%) of nurse`s filled report after injured.

Table (3): the distribution of nurse`s according to patient Condition during exposure to needle stick injury.

N=120

Condition	*Frequency*	*Percentage*
High risk	16	16.8%
Not at risk	38	40.0%
Not sure	41	43.2%
Total	95	100%

The above table showed that (16.8%) of nurse`s have sustained needle stick injury from high risk patient, (40.0%) from not risk patient and (43.2 %) of nurse`s wear not sure patient condition during exposure to needle stick injury.

Table NO(4) the distribution attitude regarding to whom reporting the incidence of injury.

N=120

Department	*Frequency*	*Percentage*
Line manager	1	5.0%
Infection control unit	6	30.0%
No body	13	65.0%
Total	20	100%

The above table showed that more than two third of nurses they were not reported to any person (65.0%).While only (5%) they report to the line manager, and (30.0%) reported to the infection control unit

Table NO (5): the distribution of nurse`s according to their type of activity during exposure to needle stick injury.

N=120

Timing	*Frequency*	*Percentage*
While recapping a used needle	45	42.4%
While putting the item in to disposable container	6	5.7%
Device left on inappropriate place	1	0.9%
During suturing	7	6.6%
During canulation	36	34%
During blood drawing	11	10.4%
Total	106	100%

The above table showed that (42.4%)of nurse`s had injured during recapping of used needle,(34%)during canulation ,(10.4%)during blood sampling ,(6.6%) during suturing ,(5.7%)during putting item in

disposable container and(0.9%)during left item from inappropriate place .

Table NO (6).the distribution of nurse`s according to their object condition during exposure to needle stick injury.

N=120

Condition	*Frequency*	*Percentage*
Contaminated	51	53.7%
Non contaminated	36	37.9%
Unknown	8	8.4%
Total	95	100%

The above table showed that (53.7%) of nurses` had injured with contaminated object, (37.9 %) with un contaminated object and (8.4%) of nurse`s wear not sure their object condition during needle stick occurred.

Table (7): the distribution of nurse`s according to type of sharp object was injured them.

N=120

Type	*Frequency*	*Percentage*
Needle of syringe	62	52.1%
Needle of IV catheter	32	26.9%
Needle / holder vacuum tube blood collection	2	1.7%
Suture needle	7	5.9%
Bald	0	0%
Ampule	16	13.4%
Total	119	100%

The above table showed that(52.1 %)of nurse`s had injured by needle of syringe,(26.9%)by needle of IV catheter,(13.4%)ampules,(5.9%)suture needle and (1.7 %)by needle tube blood collection.

Table NO (8): the distribution of nurse's according to their site of injury. N=120

Location	*Frequency*	*Percentage*
Arm	3	3%
Face / head	1	1 %
Finger	84	83.1%
Palm of hand	13	12.9%
Dorsal of hand	0	0%
Total	101	100%

The above table showed that(83.1%) of nurse`s had injured in their finger, (12.9%) in palm of the hand,( 3%) in arm of the hand and (1%) of nurse`s has injured in face| head.

Table NO (9).the distribution of nurse`s according to their action after exposure to needle stick injury

N=120

Immediate action	*Frequency*	*Percentage*
Cleaning with normal saline and bandaging	16	16.9%
Cleaning with tap water and bandaging	6	6.3%
Cleaning with antiseptic solution and bandaging	71	74.7%
No action	2	2.1%
Total	95	100%

The above table showed that (74.7%) of nurse`s had cleaned the injury site with antiseptic solution (16.9 %) used normal saline and bandaging,

(6.3%) used tape water and bandaging and (2.1%) of nurse`s are not doing anything.

Table (10): The distribution of nurse`s according to their knowledge regarding preventative measure of needle stick injury and infection control. ***N=120***

Level of knowledge	*Frequency*	*Percentage*
Knowledgeable	37	30.8%
Satisfy knowledge	32	26.7%
Un satisfy knowledge	34	28.3%
Poor	17	14.2%
Un knowledgeable	0	0%
Total	120	100%

The above table showed that(30.8 %) of nurse`s ware knowledgeable about preventative measures of needle stick injury and infection control (26.7%) ware satisfy knowledge,( 28.3%) ware un satisfy knowledge, and (14.2 %) of nurse`s ware poor knowledge regarding preventative measure of needle stick injury and infection control.

Table (11) the distribution of nurse`s according to their timing of attended the needle stick injury prevention and infection control course. N=120

Times	*Frequency*	*Percentage*
Once	10	8.3%
Twice	5	4.2%
Never	105	87.5%
Total	120	100%

The above table showed that majority (87.5%) of nurse`s not attended infection control course, (8.3%) attended once time, and (4.2%) of nurse`s attended twice.

Table NO (12) the distribution of nursing according to their frequency of vaccination against HBV.

N=120

Condition	***Frequency***	***Percentage***
Vaccinated	51	42.5%
Not vaccinated	69	57.5%
Total	120	100%

The above table showed that (42.5%) of nurse`s had vaccinated against HBV and (57.5%) of nurse`s not vaccinated.

Table NO (13) the distribution of nurse's according to their vision condition.

N=120

Vision condition	***Frequency***	***Percentage***
Normal vision	83	69.2%
Vision problems: **Using glass**	23	19.2%
Don't using glass	14	11.7%
Total	120	100%

The above table showed that (19.2%) of nurse`s had used glass, (11.7 %) not used glass, and (69.2%) of nurse`s no vision impairment.

Table NO (14): Cross tabulation between frequency of injury and years of experience. N=120

Experience	***Frequency of injury***				***Total***	***P value***
	One	twice	three or more	never		
less than 1 year	12	0	0	0	12	.000
1-2 year	21	11	0	0	32	.000
3-5 years	0	24	19	0	43	.000
more than 5 year	0	0	8	25	33	.000

Total	33	35	27	25	120	

Table NO (15) Cross tabulation between level of education and immediate wound care action care after injury. N=95

level of education	***immediate injury care***			***Total***	***P. value***
	cleaning with n/s and bandaging	cleaning with normal tap water	cleaning with antiseptic solution		
Diploma	10	0	0	10	0.000
Bachelor	6	8	71	85	0.000
Total	16	8	71	95	

Table NO (16) Cross tabulation between Area of work and frequency to sustained injury among nurses group.

N=120

area of work	***Frequency of injury***				***Total***	**P. value**
	Once	Twice	three or more	never		
ICU	16	0	0	0	16	.000
CCU	9	0	0	0	9	.000
Dialysis	8	4	0	0	12	.000

Medicinee	0	28	0	0	28	.000
Surgery	0	3	19	0	22	.000
obs/gyne	0	0	8	6	14	.000
Pediatric	0	0	0	19	19	.000
Total	33	35	27	25	120	

5.1. Discussion

Nurses were most likely to have needle stick injuries among health care workers. Percutaneous exposure to contaminated needle sticks and other sharps is an occupational hazard to nurses that causes morbidity and mortality from infections with blood borne pathogens. **(Iram Manzoor,{etal},2010)**

Reporting sharps injuries is important as it leads to sharing of the causes of the injuries and subsequent prevention of those accidents. Proper work environment might decrease the number of sharps injuries. Safe disposal boxes should be provided in all patient rooms and clinical settings. **(Honda, {etal})**

The study reveal that most of the nurses with vary educational level, where more than three-quarters (80.8%) of a study had Baccalaureate degree, while others with master degree and (8.3%) was diploma. While the varied experiences of nurse`s, study found that one third of nurse`s (35.8%) had three to five years of experience.

With regard to the prevalence of needle stick and sharp injury, this study found more than three quarters (79.2%) of nurse`s `had sustained to needle stick injures at least once time. these finding is higher rate compared with a low rate reported in previous Studies .In a study from Malaysia in 2008, the prevalence of needle stick and sharp injury was (27.9%), and in an African study in 2004 it was (53.2%) **(Honda et al, 2011)**.
In this study, it is considered that the high prevalence was due to heavy workloads and lack nursing precaution due to daily nursing care.

According to the study, it found that, the years of experience and place of work were highly significantly associated with needle stick injury *p* (0.00). nurse`s in medicine, surgery departments are mostly injured by needle and sharp objects.one explanation of these high rate, large number of patient come for surgical ,medicine treatment. Also the pressure of work, time constrains, and high rate use of sharp objects.

The study found nurse`s how had been working (3-5)years wear about two time more likely to have needle stick and sharp injury than those working from(1-2)years ,more experienced nurse wear more likely to have needle stick and sharp injury compared to less experienced nurse and show highly significantly associated with needle stick injury *p.value* (0.00) This finding Contravenes with findings in a study conducted in 2011in Thia regional hospital which showed that less experience nurse`s exposures to needle stick and sharp injury more than those having more experience year. **(Honda et al, 2011).**in this stud the stress, heavy workload, and

lake of awareness to needle stick prevention and control may responsible for this finding.

According to the study, found that the higher rate of needle stick injuries (42.4%) occur at the time of recapping needle followed by (34%) during canulation, (10.4%) while drawing blood, (6.6%) during suturing,(5.7) while putting item in disposables container. an adequate training of nurse`s or their refused to follow correct procedure, un proper handling object during procedure responsible for this injuries.

According to the study, it found that, more than half (53.7%) of nurse`s had injured with contaminated item, (37.9%) injured with non-contaminated item and (8.7%) of nurse`s ware not sure about item contamination or non-contamination at the time of injury.

These injuries are not only causing health consequence, but also cause emotional distress .and directly affects the quality of nursing care.so the use of personal protective measure is very important to reduce the frequency of injury and impact of blood borne disease .

The study found that, more than two third (79.2%) of nurse`s had experienced needle stick and sharp injury .of these the majority (78.9%) did not report that the incident, there was lack of awareness among nurse`s regarding important of reporting needle stick injury .so nursing staff should be aware about important of incidence report, and hospital policy need to encourage reporting system.This supported by previous study mentioned that "Reporting needle stick injures is important as .it lead to sharing of the causes of injuries and subsequent prevention of those accidents". **(Honda et al, 2011)**

the study showed (16.8%) of nurse`s exposure to injury from high risk patient, (40.0%) injured from non-risk patient and the majority (43.2%) of nurses ware not sure about patient condition at time of injury. this indicate to lake of nurse`s interesting to serological test after injury

accrued to identify patient risk .so serological test after injury is very important to take appropriate measure, immunization, or chemo prophylactic. And standardly hospital has to provide screening test for any admitted patients to provide safety for the staff, and to be aware.

According to the study it found that , (52.1%)of injuries occurred by needle of syringe, IV catheter needle caused (26.9%) of injuries ,(13.4%)caused by ampules during preparation of drugs ,suture needle caused (5.9%)of injuries ,and (1.7%) of injuries caused by needle tube blood collection .if followed safety injection and good preparation techniques this injuries dose not occurred.so use of safety injection techniques and good preparation techniques is impotent to maintained infection control and protect both patient and nurse`s.

According to the Study found, more than three quarter (83.1%) of injuries affected their finger, this fined refer to unsafely designed needle and un proper handling sharp object. Also regarding action about wound care, the study showed highly significant associated between the level of education and action taken about wound care *p.value* (0.00). Most (74.7%) of the nurses cleaned the wound with antiseptic solution, and apply bandage.

In addition to that ,regarding nurse`s knowledge about preventative measure of needle stick injury and infection control ,a study found ,that (30.8%)of nurses wear knowledgeable ,(26.7%)wear satisfied knowledge ,(28.3%)wear unsatisfied knowledge ,and (14.2%) wear poor knowledge about preventative measure of needle stick injury and infection control .

Moreover , according to the study, found that more than half (57.5%) of nurse`s not vaccinated against HBV, this finding refer to un availability of hepatitis B vaccination and lack of nurses awareness about the important of vaccination .so, encourage of the vaccination program in

hospital and provide nursing awareness is very needed to reduce risk of blood born disease .

Finally the study reported that, there was no available safety box at site of work in most hospital wards, and if present not enough or covered, these finding indicate the Ineffectiveness of infection control unit about monitoring of the work environment and provide facility of safety measure .so, hospital need to urgent activation of the of infection control unit, also the was no training courses for nurse and this affect their responsibility and precaution about infection control to protect themselves from sharp injury ,so the continues training program encourage to decrease the frequency of injury and promote safety.

5.2. Conclusion

Based on the finding present study ,it was concluded that :-

- High prevalence rate (79.4%) of needle stick and sharp injury among nurses, but low reporting rat .improving the reporting system in hospital should be priority.
- The study revealed that, some practice as recapping of used needle was the most contributing factor to needle stick and sharp injury, and most of injuries occurred during canulation procedure.
- Probability of nursing staff to risk blood born disease is high related to lack of vaccination.

- No training program regarding infection control and prevention in hospital, in addition to these the study explained that more than half of nurse`s wear have sufficient knowledge about infection control .and there was gap between knowledge and practice attitude toward infection control and prevention of needle stick injury .
- Experience years and work place are highly statistical significant associated with needle stick and sharp injury, *p*. value (0.00).

5.3. Recommendation

The study recommended the followings:-

By the infection control unit:

1. Reporting of needle stick injury should be mandatory to infection control unit.
2. Activate the role of the infection control unit.
3. Full vaccination of all nurses.
4. Enhance the environment of the work and provision the facilities require for infection control especially sharp box.

By the general hospital head nurse, manger:

1. Regular courses and seminars should be conducted for needle stick and sharp injury prevention and management.
2. Application of screening test programme for any admitted patient.

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