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ASSESSMENT OF ASEPTIC TECHNIQUE AMONG NURSES IN
MANAGEMENT OF BURNS PATIENTS AT KENYATTA
NATIONAL HOSPITAL

By *CHEPKOK JACQUELINE JEROTICH*

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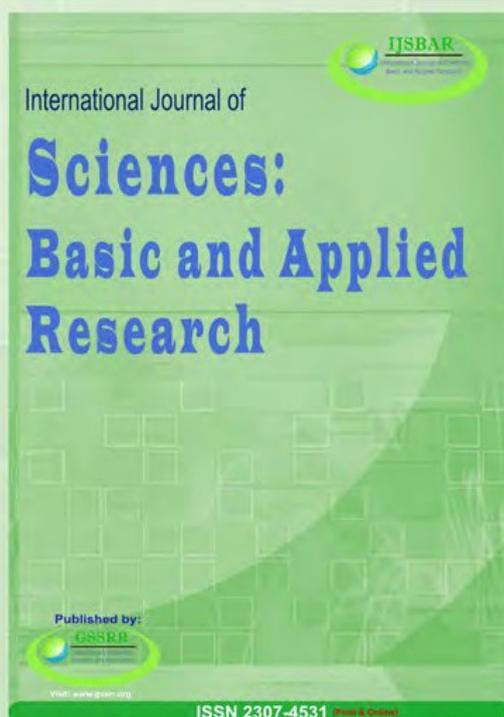
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MANAGEMENT OF BURNS PATIENTS AT KENYATTA NATIONAL
HOSPITAL

CHEPKOK JACQUELINE JEROTICH

H56/75069/2014

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENT FOR THE AWARD OF MASTER OF SCIENCE DEGREE IN
NURSING (MEDICAL-SURGICAL) OF THE UNIVERSITY OF NAIROBI.

OCTOBER, 2016

DECLARATION

I, Chepkok Jacqueline Jerotich, the undersigned, declare that this is my original work and has not been submitted for any award to any other college, institution or university other than the University of Nairobi for an academic award.

Signed : _____ Date: _____

SUPERVISORS APPROVAL

We the undersigned certify that this dissertation has been submitted for the degree of Masters of Science in Nursing (Medical –Surgical) of the University of Nairobi with our approval as supervisors.

1. Dr. James Mwaura, PhD,

Senior Lecturer, University of Nairobi

Signature.....

Date.....

2. Mrs. Eunice Ajode Odhiambo, MScN Comm., BScN, Higher dip comm., KRN, FP

Lecturer, University of Nairobi

Signature.....

Date.....

DEDICATION

I dedicate this research to my parents the late Mr. Chepkok and Mrs. Chepkok, my siblings Getrude, Mercy, Kelvin, Kenneth who were a great inspiration and my son Yannick for his encouragement throughout and to all inpatients in KNH with burn wounds and for whom I am committed to ensure quick recovery.

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May God bless you all.

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LIST OF ABBREVIATIONS AND ACRONYMS

BW	- Burns wound
BWI	- Burn wound infection
ERC	-Ethics and Research Committee
HCAI	- Health Care Acquired Infections
ICM	- Infection control measures
K.N.H	-Kenyatta National Hospital
MDG	- Millennium development goals
NI	- Nosocomial infection
NMR	-Neonatal mortality rate
NCK	-Nursing Council Of Kenya
SANC	- South Africa Nursing Council
SPSS	-Statistical Package for the Social Science
TIME	-Tissue management, Infection and inflammation, Moisture imbalance and Epithelial edge of wound
TBSA	- Total Burn Surface Area
UON	-University Of Nairobi
WHO	- World health organization

OPERATIONAL DEFINATION

Aseptic technique: is a method designed to prevent contamination from microorganisms. It involves applying the strictest rules and utilizing what is known about infection prevention to minimize the risks that one will experience an infection (Kristeen Cherney and Rachel Nall 2015)

Burn - A burn is an injury to the skin or other organic tissue primarily caused by thermal or other acute trauma. It occurs when some or all of the cells in the skin or other tissue is destroyed by hot liquids (scalds), hot solids (contact burns), flames (flame burns), radiation, radioactivity, electricity, friction or chemicals, cold or frost bite (American Burn Association, 2009).

Burn wound management - Burn wound management is the treating of burn wounds. Management starts with an assessment of a burn wound in terms of size, depth and location. Post assessment, the wound is cleaned and dressings applied depending on the depth of the burn wound (Demling & DeSanti, 2004).

Burns unit - A burns unit is an organized medical system for the total care of the burned patient (British Burn Association, 2002).

Competence- is knowledge, skill (behavior), attitude (interpersonal) and values; a deliberate exercise of judgment based on knowledge and understanding (Bruce, Klopper & Mellish, 2011: 176).

Evidence- based wound management - The integration of best research evidence, with clinical expertise and patient values (Sackett, Straus, Richardson, et al., 2000).

Healthcare –associated infection (nasocomial infection): infection associated with healthcare in any setting .The infections are not present at the time of entry into the healthcare process but may acquires it while receiving treatment for other conditions.

(National Infection Prevention and Control Guidelines for Health Care Services in Kenya ,2010)

Health: is a state of complete physical, mental and social well-being and merely the absence of disease or infirmity. (WHO,2003)

Management – The specific treatment of a disease or a condition (Oxford English Dictionary, 2014).

Methodological assumptions - Methodological assumptions inform the nature of the research process, including the most suitable method to be used (Mouton, 1996: 124). In this study the methodological assumptions include: evidence-based research, the scientific method and ethical research.

Morbidity refers to the disease state of an individual, or the incidence of illness in a population.

Mortality refers to the state of being mortal, or the incidence of death (number of deaths) in a population.

Nurse - A nurse is a person registered with the NCK to practice nursing or midwifery (SANC, 1984: Nursing Act, 2005), and who practices her/his profession for gain (Searle, et al., 2009:50).

Nursing - Nursing is a caring profession practiced by a person registered with the South Africa Nursing Council, which supports, cares for and treats a health care user to achieve or maintain health where possible; cares for a health care user so that he or she lives in comfort and with dignity until death (SANC, 1984).

The nursing process - A systematic, problem-solving approach used to identify, prevent and treat actual or potential health problems and promote wellness (Chabeli, 2007).

Wound healing: the restoration of injured tissues by replacement of death tissue with viable tissue
Closed wound dressing: wound that does not communicate directly with the atmosphere

Wound: a bodily injury caused by physical means with disruption of the normal continuity of the skin structure.

ABSTRACT

Background: Nurses are at greater risk of acquiring and transmitting Health Care Acquired Infections (HCAI) in the course of delivering nursing care; measures to prevent the transmissions are therefore a significant core nursing care. Aseptic Technique among nurses in infection control during management of burns plays a vital role in reducing their morbidity and mortality and hence cost of burn wound management at individual and national level. Therefore, HCAI is the most serious complication of burns with sepsis being the main cause of death. Adherence to the standard operating procedures on burns management put in place by KNH on aseptic techniques assist in preventing infection spread. The aim of this study was to assess aseptic technique among nurses in management of burns patients at KNH.

Methods: A cross sectional descriptive study design was employed to obtain a sample size of 59 nurses working in the burns wards, Kenyatta National Hospital. A self administered questionnaire and structured observational checklist was used to collect data. Data was coded and analyzed using SPSS version 21, descriptive statistics such as median, mean and frequency distribution were applied and categorical data was analyzed using chi-square. Measurements of association between the independent variables with key dependent variable were ascertained through logistical regression modeling.

Results: 42.9% of the participants did not wash their hands properly before, during and after the dressing procedure while 88.1% had good knowledge on aseptic technique , however 14.6% of the participants maintained the aseptic technique practice throughout the procedure while 85.4% did not. Statistical significance was found between barriers to aseptic technique and adequate water supply in the taps and soap at $P=0.038(OR=4.5)$.70.7% of the rooms lacked standard operating procedures on infection prevention. Presences of segregation posters were present at 31.6 % of the rooms. Barriers to aseptic technique implementation were noted by 54.8% of the nurse's in hindering application of knowledge to practice.

RECOMENDATION: This results suggest that nurses in the specialized wards need to be re - trained on aseptic technique procedures by the institution and institutional policies be availed to the respective ward departments, in addition to adequate logistics on supplies and equipments Infection prevention surveillane needs to be improved from the managerial to the ward level to maintain the Standard Operating Procedures

CHAPTER ONE: INTRODUCTION

1.1 Background information

Patients with severe burns may die due to complications such as septicemia, Burns wound infection (BWI) is the most frequent nosocomial infection in burn units. Healthcare –associated infection is the most serious complication of burns with sepsis being the main cause of death (Church et al, 2006). Other consequences of burn wounds include pain, discomfort, inconvenience and disability (Odabas A.B et al. 2009). Wounds management may also lead to financial drain. Non-adherence to aseptic techniques would prolong morbidity and mortality (McRobert & Stiles, 2014) and hence cost of burn wound management at individual and national level.

As social scientists agree, there is no national culture and so there is no national burn management culture and or guideline. Each burn unit has its own burn management culture influenced by many factors hence the need for unit-based studies since in social studies, transferability and generalization of findings is not recommended from trend analysis.

The number of patients burned annually is alarming (Andrews E.A. 2015). Globally it has been reported that fire related injuries account for 265 000 deaths per year, the vast majority being in low and middle income countries (World Health Organization, Fact sheet number 365 of 2014). The highest number of reported deaths were in South East Asia (57 %), followed by Africa (12, 2%) and low and middle regions in the Eastern Mediterranean (11%) according to the World Health Organization (WHO, 2002).

The WHO (2008), reported that the incidence of fire related injuries, which required medical attention per year was 10,9 million globally, with the most affected regions being South East Asia (5.9 million), followed by Africa (1,7 million) and the Eastern Mediterranean (1,5 million). Observably, the burden of burns is experienced mostly in developing countries where access to health care and resources are limited (Andrews E.A. 2015).

This study was done in Kenya which is a developing country and in Nairobi the capital city of Kenya. Like all other developing countries, Nairobi is characterized by urban migration, poverty and development of slum areas. These urban characteristics contributes and relates significantly to overcrowding and the risk of burns (Rode & Rogers 2011) Advances in research over the years has significantly improved the outcomes of burns as seen with the use of antiseptics in the 1960's, increased use of occlusive dressings and early surgery in the 1970's and topical

antimicrobial agents in the 1990's (Demling & DeSanti, 2001). Yet, despite these advances, some hospitals still use outdated methods and techniques such as the use of Silver Sulphadiazine (SSD) cream as the standard of care. Newer literature proves that the disadvantages of SSD outweighs the benefits (Opasanon, Muangman & Mamiviriyachote, 2010; Muangman, Pundee, Opasanon, et al., 2010; Caruso, Foster, Blome-Eberwein, et al., 2006; Varas, O'Keeffe, Namias, et al., 2005).

Most research in the management of burn wounds focuses on the surgical management of the burn with no study focusing on the management of burn wounds by nurses. Burns are currently being managed by nurses; however their clinical practices differ extensively. There are no standards or guidelines in place to inform nursing practice and consequently not all patients benefit from evidence informed burn wound management techniques'.

A lot of studies have been conducted in relation to surgical burn wound management. Emphases have been given to operation in Burn Unit which usually requires operations. The focus of this study was to assess aseptic techniques among nurse in management of burns. Nurses, are expected to be competent in wound management, which is a skill taught as part of the undergraduate general nursing curriculum (Bruce, Klopper & Mellish, 2011: 176).

In addition, knowledge provides the basis for informed decision-making and the framework to develop and maintain competence (Benbow, 1992). Nurses therefore have a responsibility to be competent on the principles of burn wound management. Severe and poorly managed burn infections can lead to paralytic ileus, shock, compartment syndrome and acute renal failure among others (Brunner and Suddarth's 2010).

Chronic infections can cause septicemia or bone infection which can lead to death. Sepsis associated encephalopathy increases morbidity and mortality especially in patients (Maramattom, 2007). Burns care is complicated by numerous factors such as financial constrains, lack of resources, guidelines, healthcare personnel and patients factors, in the continent of Africa (Albertyn R, Numanoglu A. & Rode H., 2014). The role of aseptic technique measures in relation to other factors need to be identified and reinforced.

Kenya has reported significant improvement in the practice of medicine (Elamenya et al 2015). Notable attempts have been observed in efforts to provide aseptic conditions in surgical wards However, incidences of wound infection is increasing. Management of wound infection remains a challenge in the surgical areas with burns patients being at high risk for infection (Coban Y.K 2012), leading cause of burns death are sepsis and multiorgan failure (William F.N 2009). Therefore prevention and management is primary concern in burns care.

Some studies have been done in Kenyatta National Hospital (KNH) on antibiotic sensitivity patterns (Kinyua, 2013) and pain management (Kiplangat, 2013). Aseptic Technique is depended on many factors including attitudes which are not constant. Aseptic technique in wound management studies need to be done periodically in many hospitals and even in the same wards to generate more knowledge.

1.2 Problem Statement

Burn wound infections if poorly assessed and managed can lead to long-term disabilities, increased morbidity and mortality.

The role of aseptic techniques as infection control measures in relation to other factors need to be identified and reinforced and this will enhance patients care To minimize the injuries after a severe accident, intensive care performed by specialized professionals is required. This is hard to accomplish in a developing country, where very few specialized burns centre's and trained burns professionals exist (Chalya et al, 2011).

Rate of burns wound infection in KNH was 18.7% in total of 347 patients, with risk factors predisposing to the infection being varied from age, extend of burns surface area, different modes of management and its effectiveness (Wanjari, 2013) Infections cause the patient more suffering and extend the stay at the hospitals. In order to prevent infection the environment around the wound should be clean. (Almas. et al 2011). Therefore the need for this research was to assess aseptic technique during burns wound management among nurses.

1.3 Study justification

Burn wound infection was the most frequent infection in burn units. Such injuries could be severe, requiring critical care and/or surgical intervention.

Burns often result to wounds. A wound may result from disruption of skin either intentional or accidental (Giacometti et al, 2000). Good management of wounds is key in prevention of Healthcare –associated infection. Many of these cases lead to premature deaths. The infection rate of burns wound at KNH was 23.6% (22/93 cases) the overall study revealed strong relationship between burn wound infection and mortality in KNH (Ngugi, 2013).This study was to establish an association of aseptic technique and occurrence of burns wound infection in Kenyatta National Hospital and this will reduce prevalence of burns wound infections and support designs of preventive intervention

1.4 Objectives

1.4.1 Broad Objective

To assess aseptic technique practices among nurses in management of burns patients at Kenyatta National Hospital

1.4.2 Specific Objective

1. To assess the practice of proper hand washing technique before, during and after procedure among nurses in management of burns patients at Kenyatta National Hospital
2. To assess adherence to standard wound dressing technique among nurses in management of burns patients at Kenyatta National Hospital
3. To assess practice of proper waste segregation among nurses during management of burns patients at Kenyatta National Hospital
4. To identify the factors that influences the practice of aseptic technique among nurses during the burns management in Kenyatta National Hospital.

1.5 Expected utility of the study findings

Improve the understanding on the relationship between assessment of aseptic technique and burn wound infection and guide on interventions and reduce morbidity and mortality in the long term.

1.6 Theoretical Framework

Dorothea Orem's theory of self care was used in this study on the assessment of aseptic technique among the nursing staff in burns wound healing among inpatients in KNH. Orem's general theory of nursing is in three related parts: Theory of self care, Theory of self care deficit and theory of nursing system

This theory explains the concept of nursing as an art, helping service and technology to assist the recovering burn patients. Nursing aims at maintaining a state of health regain normal or near normal state of health in the event of burns and stabilize, control or minimize the effects of chronic poor health or disability. The nursing actions deliberately selected and performed by nurse to help individuals using the aseptic technique procedures for patient with burns wound

recover quickly and to maintain or change condition in themselves or their environment (Basavanthappa, 2010)

In her theory Dorothea, believes human being as a total being with universal, developmental needs and capable of continuous self care. A unit that can function psychologically, physiologically, socially, symbolically and biologically and that health of the patient is when they are structurally and functionally whole or sound to perform their activities after full recovery from burn wound.

The theory encompasses: self care, where the burns patient practices activities that he initiates like having an inner motivation and a positive will to accept the care being provided by the health professionals' nurses for the implementation of the wound management. By meeting the health deviation requisites (factors affecting wound healing) pathology may be controlled in its early stages (secondary prevention) and in the prevention of defects and disability (tertiary prevention).

According to Orem the factors (requisites) may be temporary or long term duration and have to be identified for proper burn wound management to be effected by the nurses (Taylor S ,2011) . Self care deficit exists when an individual's self care demands exceed his or her ability to perform self care needs and therefore nursing care is needed to identify the factors needed for and provide the effective self care quick wound healing and enhance quality of life.

Nursing system explains how the patients self care needs will be met by the nurse, patient, or both. According to Orem the burns patient needs can either be wholly or partly compensatory or supportive-education system depending with the degree and percentage of burns and other factors affecting wound healing like age, presence of other systemic infections, malnutrition and obesity. (Orem D. 2001) This study was based on the nursing system sub theory where Orem recognized that specialized technologies should be developed by members of the health profession to guide in the management of the burns wound healing

.The nursing team should be able to assess, diagnose, plan, implement and evaluate the relevant factors that would be needed for the specific individual patient in the process adhering to the aseptic procedures. In the social or interpersonal technologies should help guide the nurse use the appropriate communication skills in respect to health status and age, maintaining a therapeutic relationship with the burns patient and their relatives and this will help in coordination of the attaining the goal of achieving aseptic wound healing.

In Regulatory technologies the nurse assisting the patient either wholly or partly, in maintaining and promoting life processes ,turning the patient and assisting in movement, application of aseptic infection procedures in regulating physiological modes of functioning In health and disease hence assisting in quick patient recovery. And the nursing processes have been used as a guide on the implementation of the theory into practice. From a nursing perspective with respect to burn wound management, this theory is grounded on four pillars namely (Capenito,2013)Dressing Preparation, Proper Assessment, Effective Diagnosis and intervention

1.7 Conceptual Framework

INDEPENDENT VARIABLES

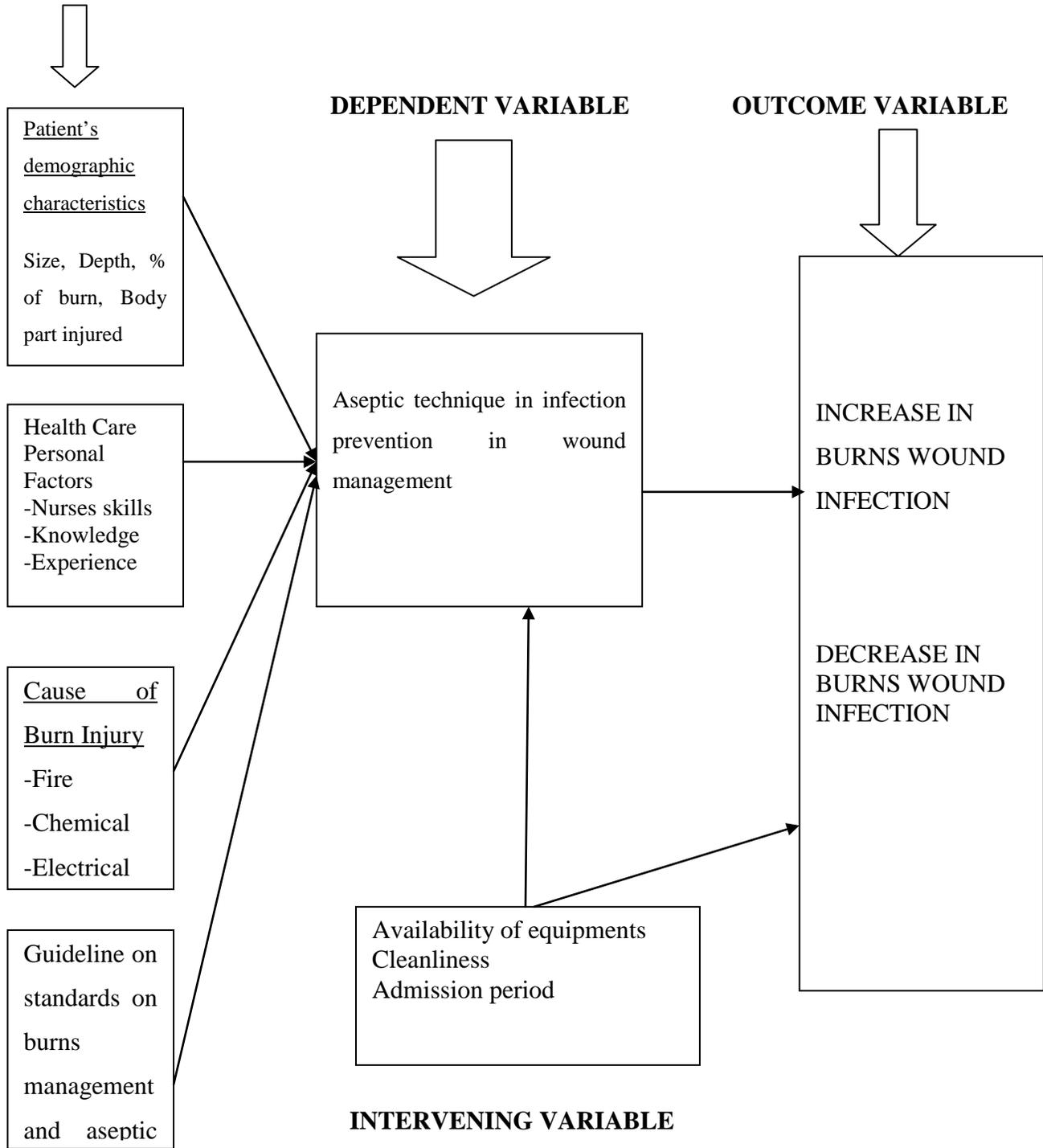


Figure 1: The Conceptual Framework

1.8 Hypothesis

75% of the nurses in KNH burns wards adhere to aseptic infection prevention control procedures during burns wound management.

1.9 Scope

Majority of wounds in KNH (59.3%) are Burn wounds while 22.7% are accidents related wounds. Majority of wound cases were found in the burns wards (56%) and rest were in burns unit (24.7%) wards. In KNH, in patients with wounds are found in the general burns ward, burns unit. This study did not limit itself to any specific ward but drew samples from all wards with burn patients.

1.10 limitations

Sample size: the number of the population under study provided a small sample size-(59), as statistical tests require a larger sample size to ensure a representation of the population and to be considered representative of the group of people to whom results will be generalized.

Lack of previously done research studies on this topic in KNH, limited the literature review search to study's done within and outside the hospital on the related topics.

Participants bias may result when they note they are being observed therefore distorting the data to be collected. Observational bias will be counteracted by each participant being observed three times by the researcher on different patients but carrying out the same procedure, on different days.

Time constrains of the semester on the duration expected for the development of the proposal to the publication of the results is limited.

CHAPTER TWO: LITERATURE REVIEW

2.1 Classification and principles of Treatment of Burn Injury

Burn wound results from tissue necrosis caused by application of or exposure to heat (thermal), cold, caustic chemicals or frictional force on the skin. In the case of thermal burns, extent of injury is proportional to the temperature applied, duration of contact and thickness of the skin.

Causes of burns include hot liquids (scald burns), flames, explosions involving flammable gases or liquids (flash burns), electricity, radiation and hot surfaces/objects (Brunicardi FC 2004; Juan PB, Burret-Nerin, David NH, et.al 2007; Wanjeri JK. 1995).

The extent of burn injuries is calculated according to the Lund and Browder chart whereby the Total body (skin) surface area (TBSA) is 100%. Inhalational burn injuries account for a further additional 10% (Brunicardi FC, Andersen D.K, Billiar T.R, et.al 2004). Treatment of burn wounds are depended on size and depth of wound as described in tables 2 and 3 below. Hence wounds need to be classified well for proper treatment to be administered

Table 1: Classification of burn wound

1st degree	Epidermis with erythema. Use analgesics only.
2nd degree superficial	Painful, weeping blisters that involve epidermis and papillary dermis. Treatment includes infusion of fluids according to Parkland's formula, cleaning and occlusive dressing with collagen or bactigras.
	Don't blanch and are painful only on pressure involving up to reticular dermis. This requires topical antibiotics, early excision (<14 days) and biological closure autograft and/or allograft.

3rd degree	Painless, waxy, leathery grey or charred and black involving epidermis, dermis and hypodermis. May require tissue flaps or even tissue excision.
4th degree	All layers of the skin and inner tissues i.e. muscle, bone and viscera.

Table 2: Burn injury severity using partial thickness

Mild burn injury	1 - 14% TBSA
Moderate burn injury	15 – 25% TBSA
Severe burn injury	Above 25% TBSA

Source: Ngugi M.G. 2013 Correlation of Burn Wound Infection and Mortality of Burn Injury Patients Hospitalized at Kenyatta National Hospital. Dissertation 2013

2.2 Pathophysiologic Response to Burn Injury

Burn injuries provoke an inflammatory response which results in increased cellular, endothelial and epithelial permeability, hypermetabolism and extensive microthrombosis. Most manifestations of this response disappear in 72 hours except for hypermetabolism which remains until wound coverage is achieved (Bloemsa GC, Dokter J, Boxma H, et al.2008; Alberto M. 2010).Associated clinical states include fluid and electrolyte imbalance leading to burn shock, nutritional deficiencies with muscle catabolism, immunologic and neuroendocrine response (elevated growth hormone levels, low levels of total T3 and T4). There is hypercortisolemia and elevated levels of glucagon (Alan DM 2000). Further, treatment of burn wounds is dependent on equipment, part of the body affected, how well the burn facilities are kept and maintained.

2.3 Factors influencing aseptic technique Measures

The outcome of burn wound management is depended on the type of first Aid given to the injured patient. Burns assessment and management are critical in elimination of infections. The

initial care starts right from the point of burn and the type of first aid given. Intense early inflammation associated with untreated burns can cause progression of depth over 48 hours and so prompt first aid can limit the extent of the primary burn injury (Tobelem et al. 2013). If cooling is commenced within 3 hours of injury, it can significantly reduce pain and edema, decrease cell damage by slowing cell metabolism in hypoxic tissue, decrease inflammatory response, stabilize vasculature and ultimately improve wound healing and reduce scarring (Cuttle L et al (2009). Cooling should be done with cool running water is preferred more than cold compress as this can cause vasoconstriction. Prolonged cooling of extensive burn wounds ((>20% total body surface area [TBSA] in adults ;> 10%TBSA in children) can cause hypothermia and thus cooling should be suspended if hypothermia is suspected (Cuttle L, & Kimble R 2010).

The type of intervention to be given to a burn patient would depend on whether or not the injured is an adult or a child. Patients' demographic is also another concern in clinical management of burn wounds. Burns management guidelines as per (McRobert J & Stiles K 2014).

For instance different approaches are recommended for: **Adults:** >3% TBSA partial thickness burn :All deep dermal and full thickness burns , associated with either electrical shock, chemical burn, non-accidental injury inhalation injury , burns to the face, hands , perineum , limbs or trunk and burns not healed within two weeks. **Children:** >1% TBSA partial thickness burn, all deep dermal and full thickness, circumferential burns and burns involving the face, hands, soles of feet, perineum, all burns associated with smoke inhalation, electrical shock or trauma, Severe metabolic disturbance, burn wound infection, all children "unwell with a burn", unhealed burns after 2 weeks, neonatal burns of any size and all children with burns and child protection concerns

Management of burn wound is depended on the cause of the burn. The cause of burn is also another variable to wound management and thus infection rate. For instance, electrical burns or electrocution injury can cause deep cutaneous burns, cardiac arrhythmias, limb loss, and serious systemic effects (Hettiaratchy S & Dziewulski P 2004). This will depend on whether or not injury is caused by domestic (low) versus industrial (high) voltage injury. The Low voltage electrical injuries will cause localized, deep burns and may initiate arrhythmias while high voltage injury will cause severe tissue damage, penetrating through fat, muscle, and bone.

Chemical burns will require different type of management. Chemical burns continue to cause cutaneous damage until completely removed.

Clinicians are warned not to wrap chemical burn wounds in polyethylene wrap (cling film) as it will contain the chemical, causing further tissue damage. • Alkalis cause deep, penetrating burns and will require prolonged irrigation. In this case the aim of water irrigation is to achieve a pH of 7. The extent of chemical burn injuries can be limited by prompt and copious irrigation guided by pH testing strips (Palao R et al 2010). This makes the cause of the burn wound another variable in this study.

The outcome of the burn wound management will be influenced by health care worker factors, Burn unit factors as well as the size and depth of the wound. Assessing the burn wound's size and depth is key in clinical decision-making and wound management. Extent of Burns is recorded as a percentage of TBSA. The percentage of body area burned classification using Lund and Browder's as cited by Jones WG, Minei JP, Barber AE (1990) method charts can easily help a clinician determine the percentage of burn for easier management (Lund CC, & Browder NC 1944).

Deep dermal burns take a long time to heal and may require skin grafting (Cubison T et al 2006). Size and depth of wound determine the type of treatment and the percentage of exposure to Infections. For instance, prolonged use of hydrogel dressings, especially in children and older people with larger burn areas, can cause hypothermia and should be avoided (Cuttle L, Kimble R 2010). Again, size and depth can lead to oedema . Oedema occurs most commonly in the first 48 hours following burn injury. Oedema interferes with tissue perfusion and wound healing by increasing the diffusion distance between capillaries and cells thus where possible, the wounded area should be elevated to reduce swelling hence pain (Evers LH et al 2010).

Key wound management is the knowledge of health care workers and how they also manage treatment. Depending on depth, burns wounds can be exceedingly painful. Analgesia will be required. How pain is managed can influence patient's comfort and uptake of treatment such as pain-free wound dressing and hence healing process (Latarjet L. 2002). Evidence suggests that emotional stress due to pain may slow down wound healing and compliance with physiotherapy (Gouin JP, Kiecolt-Glaser JK. 2011).

2.4 Complications of burn injuries

Acute complications include; Fluid and electrolyte imbalance leading to burn shock, Hypovolaemia results in acute tubular necrosis which culminates in acute renal failure, Hypokalaemia causes arrhythmias and cardiac arrest, Burn wound infection. Gastric and

duodenal ulceration (Curling's ulcers) and Anemia from bleeding wound and thrombosis within the injured vessels (Oncul O, Yuksel F, Altumay H, et al. 2002) and (Mungara MG. 2004)Long term complications include; Hypertrophic scars, Keloids, Chronic (Marjolin's) ulcer (squamous cell carcinoma), Heterotrophic ossification of joints which are painful and stiff as per Okonjo Bhibi PB (1989) and Bhatt JR (2003)

2.5 Summary of literature review

Aseptic technique procedure depends

CHAPTER THREE: RESEARCH METHODS

3.1 Research Design

The study was a cross sectional descriptive survey which was aimed at assessing aseptic technique among nurses in management of burns patients in Kenyatta National Hospital.

3.2 Study Area

The study was conducted in Kenyatta National Hospital: burns wards. KNH is the largest National Referral and Teaching Hospital in Eastern and Central Africa. The hospital occupies a 45.7 hectare piece of land, and offers specialized services including Intensive Care services, renal services and burns care services among other departments. The hospital serves people from across Nairobi and other parts of the country and neighboring countries across Eastern and Central African region and hosts between 2500 and 3000 patients in the wards, on an average day.

The wards provide inpatient care to the burns patients and are located on the 4th floor and ward 42 in the old Kenyatta hospital as the former ward next to ICU was under renovation. There are 59 qualified nurses working in burns wards with three resident doctors, three consultants and one physiotherapist. Burns unit admits adult patients with more than 29% TBSA and more than 19% TBSA for children (major burn injuries) while Burns ward admits <29% TBSA in adults and <19% for children moderate burns.

3.3 Study Population

The nurses working in burns Wards that were allocated on dressing procedure at the time of data collection within the period of May and June 2016. The population was chosen because most of the burns patients that were admitted with burns were nursed in the burns wards.

3.4 Inclusion Criteria

The research participants who were included in the study fulfilled all the inclusion criteria;

1. Qualified nurses both enrolled and registered who worked in the hospital burns Wards at the time of the study.

2. Nurses who consented to participate in the study
3. Nurses on permanent and pensionable terms of employment.
4. Nurse who worked on locum bases for longer than six months in direct contact with the burn patient's management.
5. Nurses who directly handle burn patient's management.

3.5 Exclusion criteria

1. Nurse who declined to give written consent
2. Student nurses on rotation in burns Wards at that particular time of data collection
3. Nurse on annual, maternity, study leave during the period of study.

3.6 Sample Size determination

Sample size was calculated using Fisher's formula (Mugenda and Mugenda, 2003).

$$n = \frac{z^2 p(1-p)}{d^2}$$

where

n= the desired sample size

z= 95% confidence interval or 1.96

p = the proportion of adherence to aseptic technique among nurses was taken at 50%, since it is not known

d =the degree of precision usually set at 0.05 or 5%

$$n = \frac{1.96 \times 1.96 \times 0.5 (0.5)}{0.05 \times 0.05} = 384$$

However, an adjustment was made since the study population is less than 10,000

$$n_f = \frac{n}{1 + \frac{n}{N}}$$

N_f = desired sample size – population less than 10,000

n = desired sample size – population more than 10,000

N = Estimated population size

$$n_f = \frac{384}{1 + \frac{384}{70}}$$

$$= 59 \quad \text{Therefore the desired sample population size} = 59$$

3.7 Sampling method

For this study, the entire population of the nurses working in burns Wards were included in the sample as the study population was small enough to allow for a sample to be picked from it and all different ranking of nurses were responsible for the dressings, therefore a small sample of a certain rank would not be reflective of the entire population. The total population of the nurse were 59.

Sampling frame were the nurses working in burns Wards because they were directly managing the burns patients in Kenyatta National Hospital.

Sampling unit was the participant nurse

3.8 Study Tools.

The following instruments were used; a semi structured questionnaire (Appendix 111) which was completed by the participant on social demographic characteristic and knowledge related to burns. The structured Observation checklist was used to assess how the participants applied the knowledge on aseptic technique during burns wound management in infection prevention during wound dressing. It was partially adopted from WHO 2012, designed for the purpose of assessing nurses' practice in burns wound management in burns wards.

3.9 Data Collection.

Two methods were used to collect data and these were the questionnaire for the nurses and a total of 42 participants filled. A Checklist was used to observe the 42 nurses while carrying out the wound dressing procedure in the two wards individually three times, on different days but on different patients.

Data was collected for a period of one month.

3.10 Procedure for data collection

The researcher introduced herself to the participants and explained the purpose of the study in order to get consent. Questionnaires were filled in the appropriate section and the participant was observed three times on different days while carrying out the same procedure using an

assessment checklist to provide a detailed assessment of aseptic technique during management of burns wound.

3.11 Training

Three qualified nurse working in KNH were trained by the principal investigator on what was expected of the study. The training encompassed use of the study instruments.

3.12 Data cleaning

After data collection, all the questionnaires were checked for completeness and consistency .any questionnaire that was incomplete was discarded.

3.13 Data analysis

Data was coded and analyzed by using of Statistical Package for Social Science (SPSS) version 21.0. Comparison of what was reported in the questionnaire and the observed in the checklist was made. Descriptive statistics such as Mean, Mode and Median were used to summarize and describe the data .Inferential statistics such as chi-square was used to show relationship between variables. Correlation between quantitative variables was done.P-value was set at 0.05.

3.14 Data presentation

Data was presented in form of tables, figures (pie charts and frequency graphs and report written in Microsoft word.

3.15 Study assumptions

1. Participants (nurses) provided the correct information for the questions asked.
2. sterilized instruments from the central sterilizing unit were done according to the required international standards
3. The participants in the ward are adequately sensitized on infection control measures, burns wound infection
4. Burn wards have all the basic equipments necessary to observe Infection control measures standards by W.H.O.

3.16 Ethical Considerations

Permission was sought from the Kenyatta National Hospital/University of Nairobi Ethics and Research Committee (KNH/UON ERC). Clearance to carry out the study in KNH was sought from the Department of Ethics and Research in KNH.

An informed consent (Appendices 1) was acquired from the participants. Confidentiality and anonymity was maintained by using codes instead of interviewee's names on the questionnaire and confidentiality was assured for research purpose only. Participants were under no obligation to answer questions they were not comfortable with. Ethical principles in identifying and observing the participants were applied by an informed consent was also sought from the patient. There were no risks involved in the study, nor were there any monetary gains for the participants.

3:17 Dissemination plan

Reports on the research findings were compiled, written and presented to the relevant stakeholders for examination purpose, publication and abstract presentation for scientific use.

CHAPTER FOUR: RESULTS

4.1 Introduction

This was a cross sectional study involving 42 nurse participants working in burns and ward 4D at Kenyatta National Hospital. The aim of the study was to assess the aseptic technique among nurses during burns management.

4.2 Demographic factors

The mean age of the respondents was 40.7 years with ± 7.72 and range of 33 years.

Majority 29(69%) of the respondents had diploma in nursing by the time of this study while only 9(21.5%) had attained a bachelor degree. On the number years of experience, 36(85.7%) had worked for 10 years and below with approximately 6(15%) saying that they had an experience of more than 10 years. According to this study, more than three quarters of the respondents confirmed that in deed there were barriers to aseptic techniques with inadequate suppliers 14(33.3%) topping the list, followed by insufficient knowledge 8(19%) staff shortage 2(4.8%) and only one respondent said extensive burns 1 (2.4%) as shown by Table 3.

On the percentage of burns that are mostly seen by the nurses, 21(31-50) % seemed to be the majority while 4(≤ 10 %) were the least seen by the nurses. The head and the upper limbs trunk remain the major parts of the body affected according to this study while the major cause of burns are dry flame 37(90.2%), electrical burns 29(75.6%). There was a long stay in hospital due to burns according to this study, majority of the patients take more than 29 days during wound healing management. As regards ways through which the wound could be infected, the respondents cited systemic infection as the major cause followed by direct contact.

Table 3: Demographic Factors of the respondents

Variable	Frequency	Percentage
Education Level		
Certificate	4	9.5
Diploma	29	69
Bachelors	9	21.5
Total	42	100

Years of Experience		
0-5 years	21	50
6-10 years	15	35.7
11-15 years	2	4.8
16-20 years	4	9.5
Total	42	100
The barriers to adherence		
Inadequate suppliers	14	33.3
Insufficient knowledge	8	19
Staff Shortage	2	4.8
Extensive burns	1	2.4
Missing	11	26.2
N/A	6	14.3
Total	42	100
Ever been trained in aseptic technique?		
Yes	37	88.1
No	5	11.9
Total	42	100
Frequency of training in aseptic technique?		
Once	16	38.1
Twice	12	28.6
>2 times	5	11.9
Missing	4	11.9
N/A	5	9.5
Total	42	100

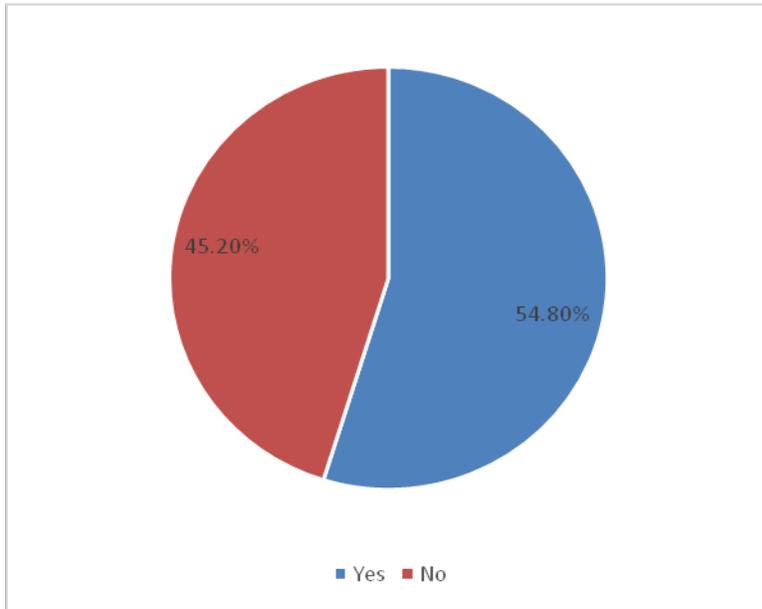


Figure 2: Pie chart showing Presence of barriers to adherence to aseptic techniques

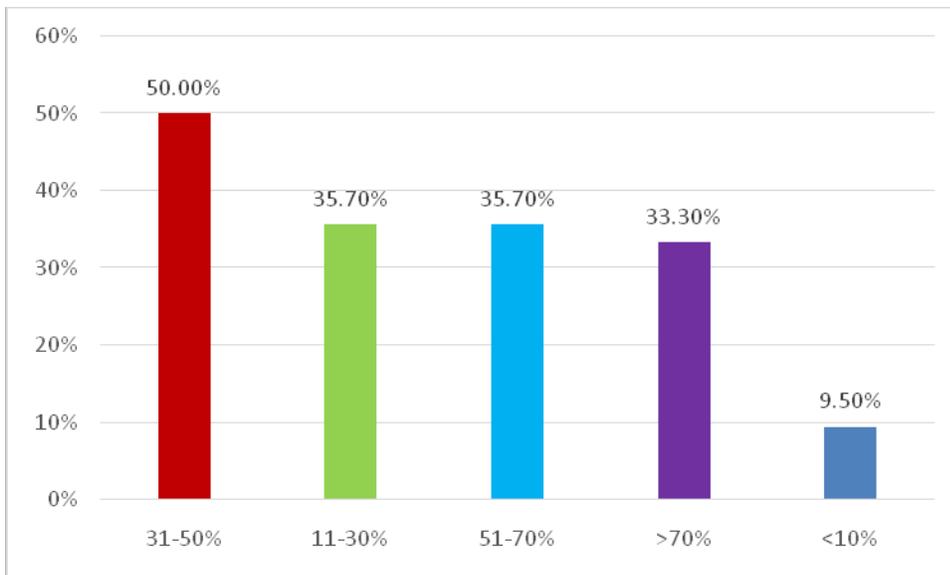


Figure 3: Percentage of burns seen by the nurses in the wards

Table 4: Body parts affected, Causes of burns and days spent

Variables	Frequency	Percentage of cases
Body parts affected		
Head	39	92.9
Upper limbs trunk	35	83.3
Lower limbs	27	64.3
Genitalia	19	45.2
Total	120	285.7
Causes of Burns		
Dry flame	37	90.2
Hot water	29	70.7
Frictional burns	20	48.8
Electrical burns	31	75.6
Chemical burns	9	22
Total	126	307.3
No of days patients spend during wound healing (Days)		
0-7	21	50
8-15	2	4.8
16-22	1	2.4
>29	17	40.5
Missing	1	2.4
Total	42	100

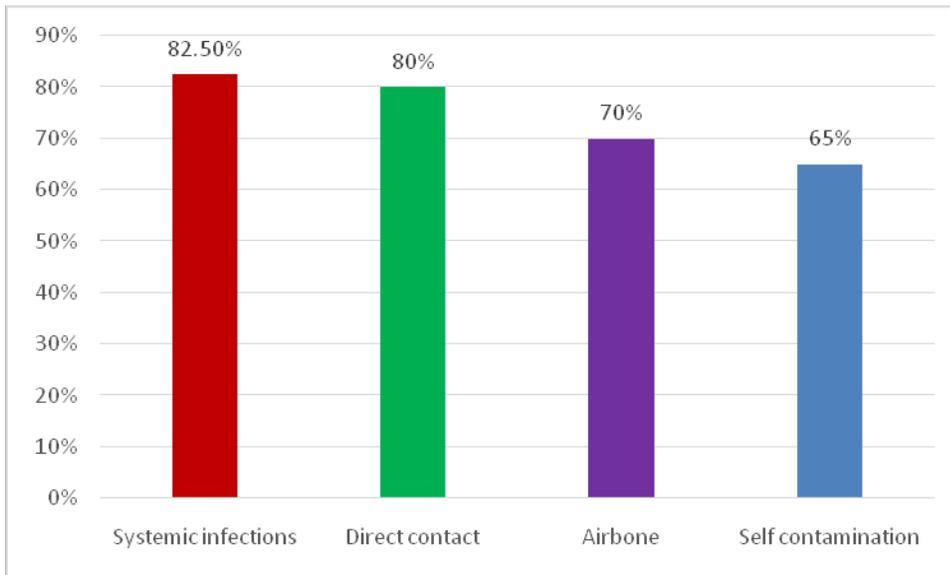


Figure 4: Ways in which wound can be infected

4. 3 The practice of proper hand washing technique

According to this study, only 7(17.1%) of the nurses washed their hands properly before starting the dressing procedure while 13(31.7%) did not attempt to wash their hands. In overall, 24(57.1%) did not wash their hands properly before, during and after the dressing procedure.

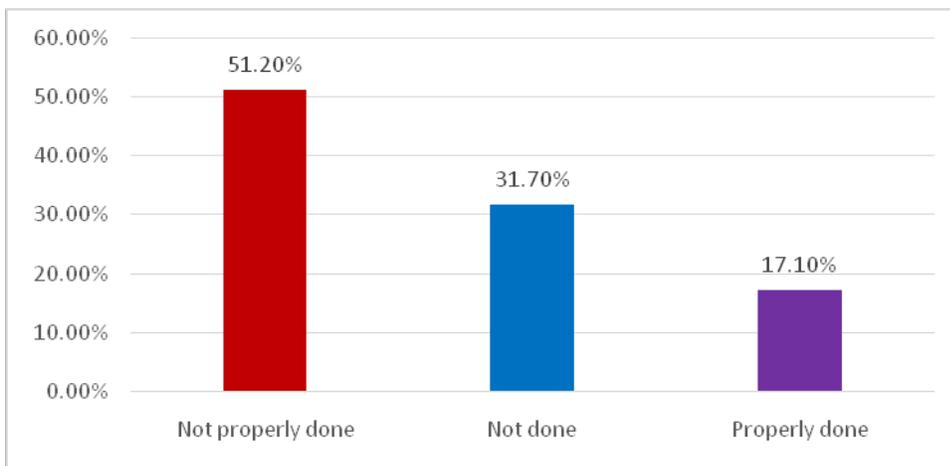


Figure 5 : Hand washing before starting the dressing procedure

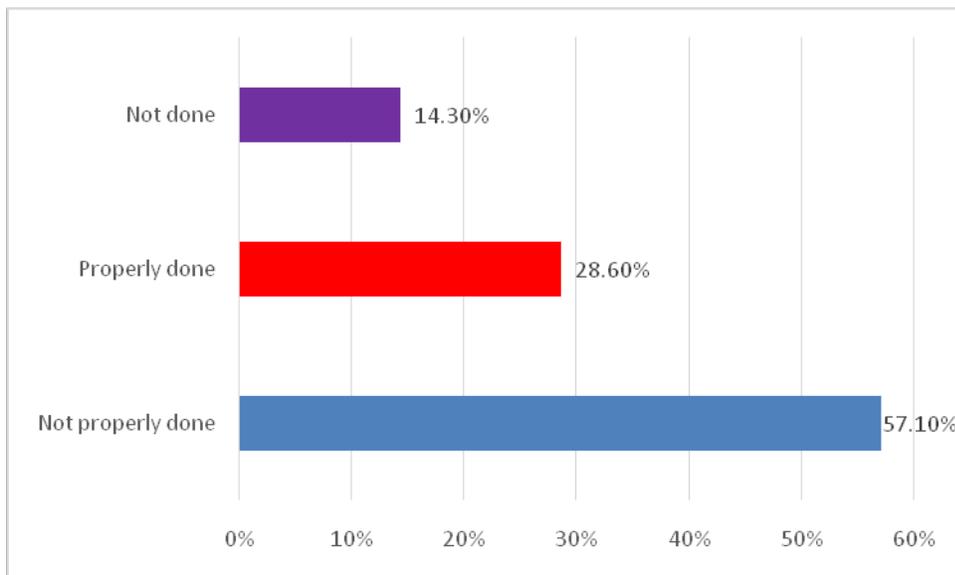


Figure 6 : Wash of hand before, during and after the dressing procedure

4.4 Assessment of standard wound dressing technique

Apart from wearing face mask at 100% before procedures, the nurses practice, gowning 33(78.6%) , use of cap 35(85.4%), practice on surface disinfection at (47.5%) and putting on shoe cover 18 (42.9%) in the wards.

There was little observation in terms of the rapport that the nurses created with their patients as only 7(17.1%) introduced themselves to the patients, less than half explained to the patients on the procedures they were going to perform while 24(58.5%) prepared the material for the dressing beforehand. Additionally, slightly over half of the nurses warmed the cleaning solution as required, with only 3(7.3%) maintaining the integrity of the patient during the dressing procedure.

The general observation on assessment and diagnosis for the burns wound was wanting as no nurse performed an assessment properly with respect to the wound while only 4.9% classified the wound in terms of the burn and the burn depth. Additionally, only 2.5% mentioned the location of the wound, 15% described the wound using TIME and only 9.5% identified and managed TIME elements.

Observation of the precision in dressing execution and procedure showed that only 18(42.9%) 9(21.4%) and 12(29.3%) properly prepared the environment, opened the packaging aseptically and checked the expiry dates of the products as required respectively. Additionally, an observation was made on how proper the dirty material were kept 20(47.6%), whether the nurses

use a prescribed solution 9(21.4%), follow up of the logical sequence procedure 7(17.1%) as summarized in **Table 6**.

On closer observation of the nursing outcome, only 3(7.1%) of the documentation reflected the nursing process with regard to wound management, 11(26.2%) of the management was based on the identification, recording and treatment of TIME-related problems while only 7(16.7%) documentation of the referral pathways were properly done.

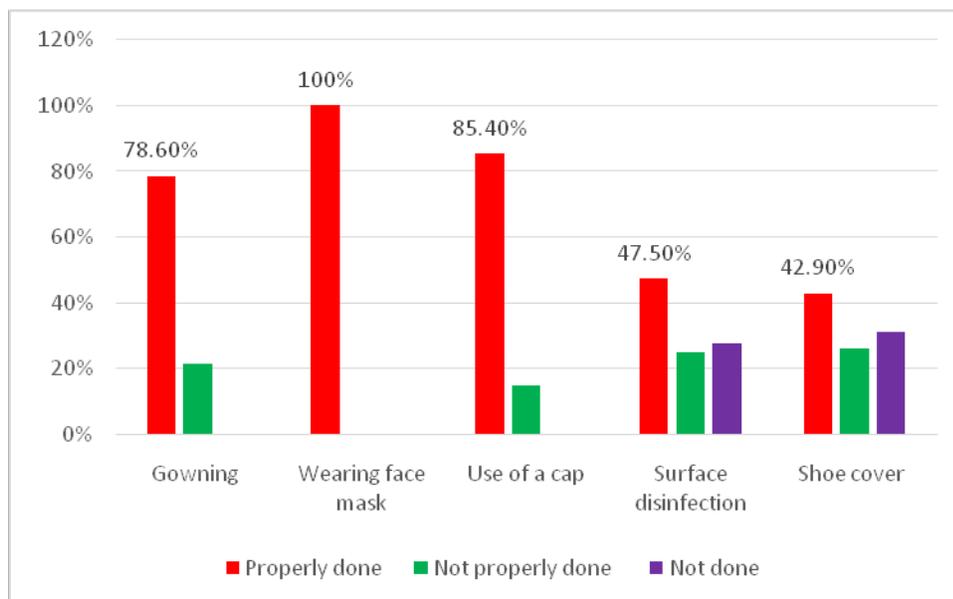


Figure 7: Assessment of Aseptic technique during procedure of burns dressing

Table 5 : Dressing Preparation

Variable	Properly done n (%)	Not properly done n (%)	Not done n (%)
Did the nurse introduce him- or herself to the patient?	7(17.1%)	17(34.1%)	20(48.8%)
Did the nurse explain the proposed procedure to the patient?	17(41.5%)	18(43.9%)	6(14.6%)
Did the nurse prepare the material for the dressing beforehand?	24(58.5%)	15(36.6%)	1(4.9%)
Did the nurse warm the cleaning solution?	23(54.8%)	15(35.7%)	4(9.5%)
Was the integrity of the patient maintained by the nurse during the dressing procedure?	3(7.3%)	23(56.1%)	15(36.6%)

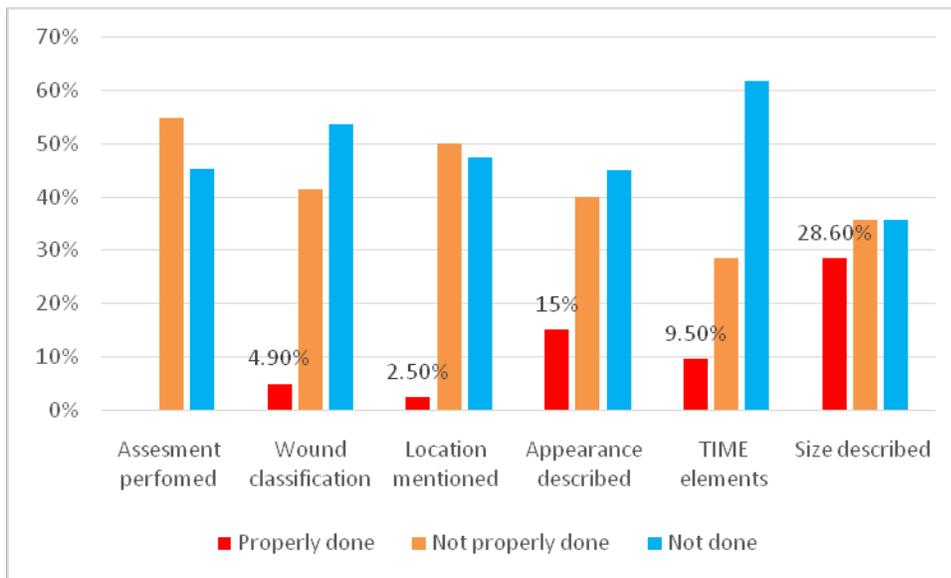


Figure 8: Assessment and diagnosis for the burns wound

Table 6: Dressing Execution

Variable	Properly done n (%)	Not properly done n (%)	Not done n (%)
Did the nurse prepare the environment?	18(42.9%)	20(47.6%)	4(9.5%)
Did the nurse open the packaging aseptically?	9(21.4%)	17(40.5%)	16(38.1%)
Did the nurse check the expiry dates of the products used?	12(29.3%)	17(41.5%)	11(29.2%)
Was the “dirty” material kept separately from the clean field?	20(47.6%)	21(50%)	1(2.4%)
Did the nurse use the prescribed solution?	9(21.4%)	31(73.8)	2(4.8)
Did the nurse follow a logical sequence throughout the procedure?	7(17.1%)	27(65.9%)	7(17.1%)
Did the nurse maintain the aseptic technique throughout the procedure?	6(14.6%)	14(34.1%)	21(51.2%)
Did the nurse take complaints of pain by the patient into consideration?	3(7.3%)	27(65.9%)	11(26.8%)

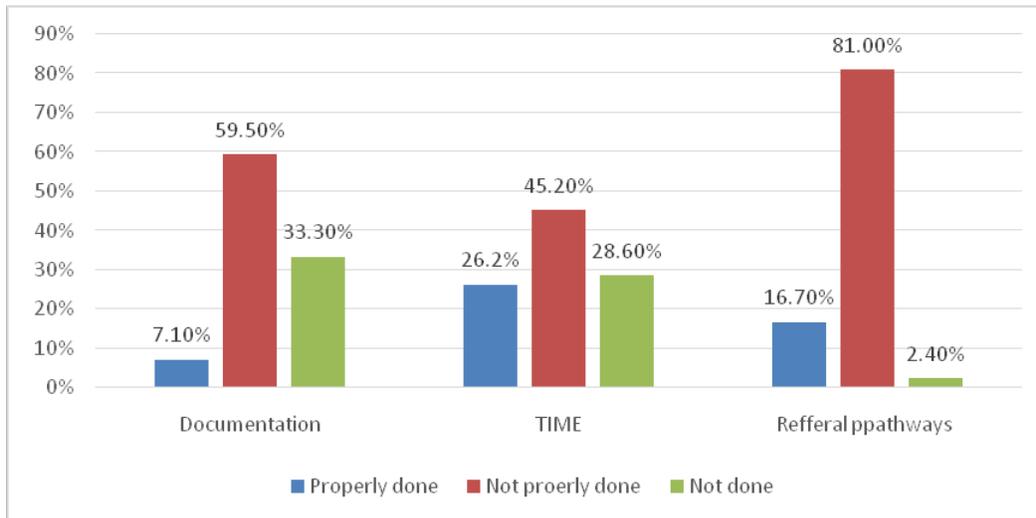


Figure 9: Nursing outcomes

4.5 Practice of proper waste segregation

In the practice of proper waste segregation, there were few segregation bins 7(16.7%) which were color coded and with foot pedals. Additionally, the black bins 34(81%) were the majority while there the red and yellow were observed at 22 (58.5%) and 17 (53.7%) respectively. Thought this study observed the presence of the safety boxes 27(64.3%) and containers with disinfectant 25(59.5%), the SOPs 12(29.3%) and segregation posters 6(31.6%) were not much observed

Table 7: Waste segregation

Variable	Present n (%)	Not present n (%)
Presence of segregation bins	7(16.7%)	35(83.3%)
Color coded bins	7(17.1%)	34(82.9%)
Bins provided with foot pedal	7(17.1%)	34(82.9%)
Presence of safety boxes	27(64.3%)	15(35.7%)
Presence of containers with disinfectant	25(59.5%)	17(40.5%)
SOPs presence in the room	12(29.3%)	29(70.7%)
Presence of segregation posters	6(31.6%)	13(68.4%)

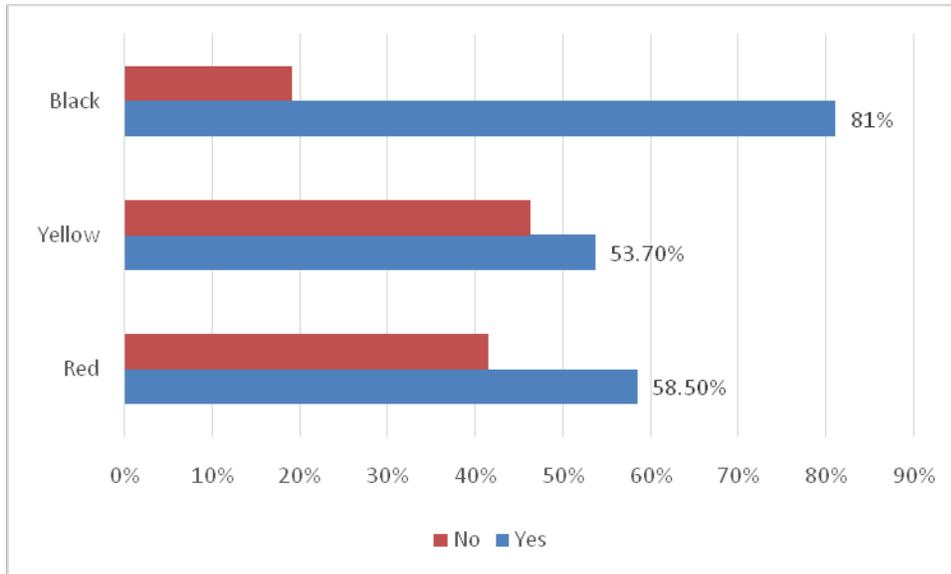


Figure 10: Presence of bins labeled

4.6 Barriers that affects the practice of aseptic technique

On whether there was adequate supply of water and soap, only 29 (69%) of the respondents replied positively while 13 (31%) said that there was no adequate supply of water and soaps. There was difference between the ward 4D and Burns as far as the adequacy of supply of water in the taps and soap are concerned. The burns ward had a fair supply of the two as shown below. The overall mean score on the availability of alcohol based hand rub, adequate suppliers for dressing burns wound and the sink bed ratio was 1.6 suggesting the following; Alcohol based hand rub are not easily available in the wards for the nurses. Additionally, there are no adequate supplies for dressing burns wounds and finally, the sink bed ratio is less than one per ten beds.

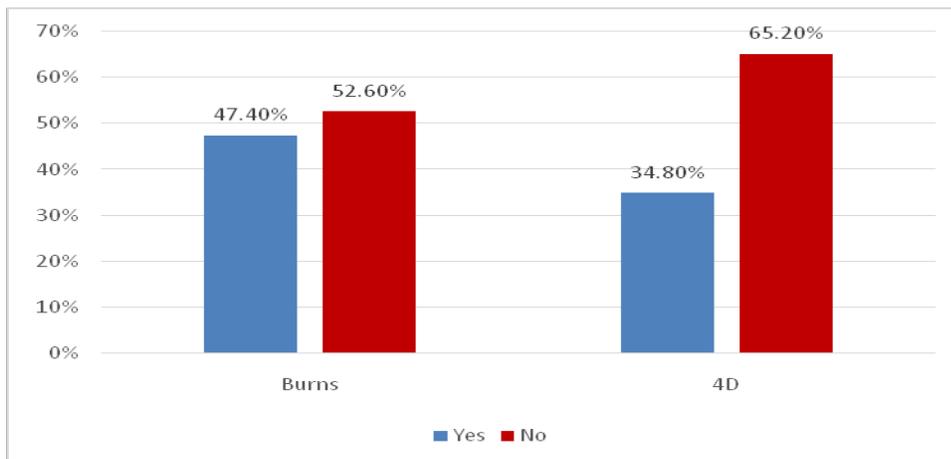


Figure 11: Availability of soap and water in the two wards

INFERENCEAL STATISTICS

According to the study, an association was found between barriers to aseptic techniques and practice of proper hand washing technique ($X^2= 18.9, P<0.001$) and adherence to standard wound dressing technique ($X^2= 31.5, P<0.000$). However, no association was found between barriers to aseptic techniques and whether segregation bins were provided.

Table 8: Cross tabulation between Practice of proper hand washing technique and barriers to aseptic techniques

Variable	Barriers to aseptic techniques		Chi-square goodness of fit test
	Yes n (%)	No n (%)	
Did the nurse wash his or her hands before during and after the dressing procedure?			$X^2= 18.9, df = 4, P= 0.001$
Properly done	7(87.5)	1(12.5)	
Not properly done	21(100)	0(0)	
Not done	5(38.5)	10(61.5)	

Table 9: Cross tabulation between Adherence to standard wound dressing technique and barriers to aseptic techniques

Variable	Barriers to aseptic techniques		Chi-square goodness of fit test
	Yes n (%)	No n (%)	
Wearing face mask before procedure?			$X^2 = 31.5$, $df = 2$, $P = 0.000$
Properly done	33(97.1)	1(12.9)	
Not properly done	0(0)	1(100)	
Not done	0(0)	4(100)	

Table 10: Cross tabulation between Proper waste segregation among nurses and barriers to aseptic techniques

Variable	Barriers to aseptic techniques		Chi-square goodness of fit test
	Yes n (%)	No n (%)	
Are three segregation bins provided?			$X^2 = 0.66$, $df = 2$, $P = 0.721$
Present	6(85.7)	1(14.3)	
Not present	27(77.1)	8(22.9)	

According to this study, there is a strong significance between the inadequacy of water and soap with barriers to aseptic technique with $P < 0.005$. According to the study, the odds of not adhering to aseptic techniques are four (4) times higher in the absence of adequate supply of water and soap. A significance was also recorded between inadequate of water and soap with the manner in which washing hands before, during and after the procedure and how the nurse washed her hands before starting the procedure at $P < 0.005$. This indicates the importance of water as far as aseptic technique is concerned.

Table 9: Cross tabulation between adequate supply of water and barriers to aseptic techniques

Variable	Adequate supply of water in the taps and soap		Chi-square goodness of fit test
	Yes n(%)	No n(%)	
Barriers to aseptic techniques			
Yes	6(35.3)	11(64.7)	$X^2= 4.37$, df = 1, P= 0.038* OR. = 4.5
No	17(68)	8(32)	
Wash hands before, during and after the procedure?			
Properly done	16(88.9)	2(8.3)	$X^2= 7.26$, df = 2, P= 0.000*
Not properly done	1(5.6)	12(50)	
Not done	1(5.6)	10(41.7)	
Nurse washes her hands before starting the procedure?			
Properly done	18(100)	0(0)	$X^2= 6.13$, df = 2, P= 0.000*
Not properly done	0(0)	12(50)	
Not done	0(0)	12(50)	

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Discussion

Although the study did not show any statistical significance for age and level of education the findings on highest education /professional level (21.5%) attest to the fact that the number of higher education degree holders working in the wards are still limited compared to 69% diploma nurses with the mean age of 40.7 .This can be explained by the fact that the older nurses acquire knowledge from their years of experience, exposure to continuous professional education than the younger nurse or most of the older nurses may have been deployed to work in other ward departments with light duties.

From the study the years of experience in the burns department show that the (50%) had less than five years experience, which affirms the rotations of nurses across other wards allowed inadequate time to acquire specific knowledge and skills in areas of specialty.

Half of the respondents(50%) acknowledged that they had knowledge on aseptic technique during burns management and that there are barriers to implementation of the technique ,major cause being inadequate supplies (33.3%) , insufficient knowledge on aseptic technique(19%) and staff shortage (4.8%) .this affirms the study findings from Mutisya et al ,(2015) on assessment of research utilization by nurses and the influencing factors, inadequate facilities for implementation of research accounted for 66.4% which is line with this study that lack of facilities could be a barrier to implementation of aseptic technique.

The study further revealed that majority of the nurses (88.1%) have knowledge of aseptic technique, possibly due to the fact that they were trained on aseptic technique measures during their training in school of nursing before qualifying and the training provided by the hospital infection control department with at least once training(38.1%), twice(28.6%).

Majority of the causes of burns was dry fire (90.2%) and electrical burns (75.6%) resulting in sustained majority being upper limb trunk and head injuries as they try to stop the fire. These findings however differed from a study by Wanjeri (2015) in that similar causes of fire included majority hot fluids (46.3%), dry fire (40.3%) and least by electricity (6.5)

Nurses have the knowledge on aseptic technique but do not practice either because they lack facilities to implement with 24(57.1%)did not properly wash their hands before, during and after the procedure, this correspond to a study where the nurses were observed not to follow recommended methods of managing wound in KNH (Ndirangu, 2008) .

Although the study findings found application of knowledge through wearing of face mask at (100%) before procedure, there lacked emphases on application of aseptic technique during wound dressing at 47.5% surface disinfection. Application of ethical principles in practice by a professional nurse is mandatory, in this study nurses-patient relationship communication created by the nurses only 7(17.1%) introduced themselves to the patients while less than half got consent to carrying out the procedure on them. This can be as result of a few staff trying to dress many patients in a shift or assumption of the fact that the patients have been in the ward so there will be no need of the consent. This findings are consisted with Amalberti.at.al(2006) who found out that workarounds “adaptation of procedures by workers to deal with the demands of the work” these procedures are often adapted to bypass or avoid a problematic feature of the system like adherence to aseptic technique.

From the study on waste segregation, the availability of black bins with peddles (81%) in the procedure room only while the yellow and red paper bags served as receiver for infectious waste during the procedure. This highlight a risk to the staff if accidental poured down as they try to put the waste into the bags therefore contaminating their hands in the process. The same sentiments were shared in a study that recognized that hands can potentially become contaminated when opening or closing waste baskets and hence the need of waste bins with peddles (Backman *.et.al.* 2012).

It was observed that Availability of decontamination solutions in the procedure rooms in some wards had no dilution date, ratio of the disinfectant used and the duration of time the instruments had been decontaminated owing to the prolonged use without replacement, study findings shared showed decontamination was being carried out with less than three buckets steps required (Gichuhi ,2015). These findings clearly indicate other factors such as supervision, provisions of correct and adequate materials and supplies’ can actually improve the quality of aseptic technique adherence among nurse

In this study availability of sterile basic dressing packs and gowns were available, but the participants who opened the packs aseptically were 9(21.4%) and 12(29.3%)remembered to check the expiry date of the pack. This could be attributed to the fact that they carry out the procedures as one staff due to shortage and use of the available other professionals like physiotherapists and occupational therapist during the procedure occasionally and assumption that they are not expired once brought by the staff from the sterilizing department.

On Application of aseptic technique knowledge into practice the study showed procedure was maintained by only 6(14.6%) while 22(51.2%) did not attempt to maintain the aseptic technique

, while logical sequence of implementing the procedure was observed by 7(17%) ,27(65.9%) did not do it properly. Findings on observation of the nursing outcome, only 3(7.1%) of the documentation reflected the nursing process with regard to wound management, 59.5% did not document properly while 33.3% did not at all, documented procedure gives evidence of the procedure done by who, where ,when and what the condition of the dressing was before, during and after the dressing. similar study findings were shared by Ohlen. A et al. (2013), showed documentation was often fragmented and information sometimes hard to find, often describing caring needs but lacked interventions and evaluations and Andrew E.A (2015) showed that a standardized format was not followed and description of the procedure were uncommunicative e.g. dressing done, no complaints which were also observed during this study

Although the hospital has an infection control department that implements improvement of the aseptic technique and injection safety practices ,wards still were noted to lack standard operating procedure on waste segregation 13(68.4%) , accidental exposure to blood and body fluid 29(70.7%), hand washing process, and material and equipment decontamination . Reasons raised to justify this was, burns unit had relocated to a different place , shortage of staff , work load due to high number of patients, lack of supplies ,lack of continues monitoring education and ignorance. It was observed Waste products were discarded outside the rooms during procedure. According to International Council of Nurses (2011), nurses in clinical care are producers of health care waste and yet are active participants in waste disposal procedures and nurses in management positions develop policies that deal with the procurement of supplies as well as the production and elimination of health care waste.

Results of this study indicate that barriers that affect the practice include inadequate water supply and soap in the taps13(31%) , burns ward had fairly more supply of water than Ward 4D this could be attributed to its location of the pumping system , inadequate supply of alcohol based hand rub, supplies for dressing burns wound s and the availability of less than one to ten sink bed ratio .These findings suggest similarity consistent to Otiende (2013) where they found that the hospital had inadequate working facilities and equipments and the respondents were dissatisfied with the health and safety regulations offered by the institution. The findings are strongly associated with Okechuku et al (2012) study that the majority of the healthcare workers complained of inadequate resources to practice standard precautions, in addition to a survey done by Warley et al(2009) on standard precaution training among nurses indicated that above 56.3% of them reported having received adequate training despite 76% of them reporting complete

knowledge on standard precautions, some of the factors that led to poor compliance were workload, insufficient training and lack of protective gear .

Finding from the study showed an association between barriers to aseptic technique and practice of proper hand washing technique($X^2= 18.9$, $P<0.001$) and adherence to standard wound dressing technique ($X^2= 31.5$, $P<0.000$).lack of proper hand washing and wound dressing technique contribute to aseptic technique barriers. Lack of waste segregation bins has no association with barriers to adherence to aseptic techniques according to this study at($X^2= 0.66$, $P=0.72$)

There is a strong significance between the inadequacy of water and soap with barriers to adherence to aseptic technique with $P=0.038$. Presence of water and soap contribute to adherence of aseptic technique through hand washing and therefore the odds of not adhering to aseptic technique is four times higher in the absence of adequate supply of water and soap.

5.2 Conclusion

Nurses working in the burns specialized units have a major key role in the prevention of sepsis during burns patient management and as such need to be competent in infection prevention practices. Most nurses have adequate knowledge on aseptic technique but exhibit poor adherence in practice. Waste segregation is ineffective done and is largely contributed by inadequate supply of color coded bins. Reference policy documents on aseptic technique practice are unavailable in the burns unit. Nurses have a professional and moral obligation to protect the health of their patients and share the responsibility to sustain and protect the natural environment (ICN, 2012).

5.3 Recommendations

Adherence of aseptic technique during burns management is paramount and cannot be underestimated in order to prevent mortality and reduce morbidity in burns patients. Therefore, from the results of this study, the following recommendations were made:

- ❖ Continuous Medical Education programme on aseptic technique to enhance adherence by nurses in burns units.
- ❖ Adequate supply of color coded bins to support effective waste segregation by nurses at the burns units.
- ❖ Availability of reference policy documents on aseptic technique practice in the burns ward settings.

- ❖ Continuous follow up programmes implemented to assess standards of aseptic technique in burns management.

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APPENDICES

Appendix 1: Participant information sheet and consent form

Title: Assessment of aseptic technique among nurses in management of burns patients at Kenyatta National Hospital

Investigator: Jacqueline Jerotich Chepkok Tel. 0722442801
School of Nursing Sciences,
University of Nairobi
Po Box 19676, Nairobi.

Introduction: I am a student at the School of Nursing Sciences, University of Nairobi pursuing a Master of Science Degree in Nursing. I am conducting a study titled: Assessment of aseptic technique among nurses in management of burns patients at Kenyatta National Hospital, Nairobi. This study is being conducted at Kenyatta national hospital ward 4D and burns unit.

The purpose of this information is to give you details pertaining to the study that will enable you make an informed decision regarding participation. You are free to ask questions to clarify any of the aspects we will discuss in this information and consent form. I will also ask you questions regarding the study before you sign the consent form to ascertain your comprehension of the information provided.

Background and objective: The purpose of this study is to assess the adherence of aseptic technique in management of burns among the in patients at KNH. with a view of coming up with an association between aseptic infection procedure and burns wound sepsis .The findings from this study could be used to Improve the understanding on the relationship between adherence to aseptic technique and burn wound infection which will guide on intervention and reduce morbidity and mortality in the long term

Participation: Participation in the study will entail answering 10 questions which you will fill in the semi-structured questionnaire and an observation check list will be used to Assess how you perform the procedure by the researcher. Observation on the participant will be done on three patients but on different days .You will not be subjected to any invasive procedure. The research involves participation of approximately 59 nurses.

Benefits: There is no direct monetary benefit in participating in this study. However, the results of the study will be useful in facilitating the understanding of the various factors affecting adherence to aseptic technique during burns management and how they can be controlled to aid in the adherence of the aseptic techniques. The findings will be availed to the hospital, other relevant decision makers and stakeholders to aid in putting in place measures that will improve the care given to the inpatient burns patients in order to avoid those suffering complications.

Risks: There are no economic or physical risks to participating in the study. However, due to the time taken in responding to question, you will take a longer time than usual at your work place. Also during the interview, some questions will require you to disclose some personal information that might trigger some negative feelings and possibly anxiety. If this happens, the researcher will refer you to the hospital counselor. The researcher will also endeavor to spend approximately 25 minutes with you.

Confidentiality: Confidentiality will be maintained and the information you provide will only be used for the intended purpose of the study. In addition, your name will not be required on any forms or used during publication of the final report thus ensuring your anonymity. All materials used during the study will be under lock and key and only the personnel involved in this study will have access to them. Electronic files will be saved on password and fire-wall protected computers.

Voluntary participation: Participation in this study is voluntary. Refusal to take part will not attract any penalty. You retain the right to withdraw from the study without any consequences. You are free not to answer any question .

Compensation: There is no compensation for participating in the study.

Conflict of interest: The research and the supervisors confirm that there is no conflict of interest amongst them.

CONSENT FORM

If you Consent to Participate in the study please sign below:

I hereby consent to participate in this study. I have been informed of the nature of the study being undertaken and potential risks explained to me. I also understand that my participation in the study is voluntary and the decision to participate or not to participate will not affect my employment status at this facility in any way whatsoever. I may also choose to discontinue my involvement in the study at any stage without any explanation or consequences. I have also been reassured that my personal details and the information I will relay will be kept confidential. I confirm that all my concerns about my participation in the study have been adequately addressed

by the investigator and the investigator have asked me questions to ascertain my comprehension of the information provided.

Participant's Signature (or thumbprint).....Date.....

I confirm that I have clearly explained to the participant the nature of the study and the contents of this consent form in detail and the participant has decided to participate voluntarily without any coercion or undue pressure.

Investigator's Signature..... Date

For any Clarification, please contact

Chepkok Jacqueline Jerotich

Researcher

Mobile Number: 0722442801

Email: chepkokjackie@yahoo.ca

Or

Dr. James Mwaura, PhD,

Senior Lecturer, Medical- surgical department,

School of Nursing, University of Nairobi

Mobile Number: 0722790202

Email: jmwaura@uonbi.ac.ke

Or

Mrs. Eunice Ajode Odhiambo, MScN Comm., BScN, Higher dip comm., KRN, FP

Lecturer: community health department

School of Nursing, University of Nairobi

Mobile Number: 0703417694, 0722358164

Email: ajode@uonbi.ac.ke

Or

The chairman

University of Nairobi-Kenyatta National Hospital ethics and research committee

P.O BOX 19676 CODE 00202

TEL(254-020)-2726300 Ext 44355

Email: uonknherc@uonbi.ac.ke

Informal Consent:

Respondent Number..... Date.....

Please allow _____ a Research Assistant to Chepkok Jacqueline Jerotich a student/researcher undertaking a Masters in Nursing degree course at the University of Nairobi to interview you in partial fulfillment of her degree course requirement.

The analyzed questionnaire can be returned to you and an opportunity to discuss the results with you can be organized on your request if you give details of your contacts privately. If need for this, please indicate after how long you will be expecting feedback from the researcher as below?

(1). Would like to discuss _____ (2) No need for discussion _____

By signing this consent form, I am giving permission to be interviewed. I _____(can be **Pseudoname**) on this date _____ do allow to be interviewed without any conditions: Sign _____ of ID No.

Thanks in advance: Correspondences;

Researcher

Chepkok Jacqueline Jerotich

Mobile number: 0722442801

Email: chepkokjackie@yahoo.ca

CC:

The chairman

University of Nairobi-Kenyatta National Hospital ethics and research committee

P.O BOX 19676 CODE 00202 TEL (254-020)-2726300 Ext 44355

Email: uonknherc@uonbi.ac.ke_

Appendix 11: Patient information sheet and consent form

Title: Assessment of aseptic technique among nurses in management of burns patients at Kenyatta National Hospital

Investigator: Jacqueline Jerotich Chepkok Tel. 0722442801
School of Nursing Sciences,
University of Nairobi
Po Box 19676, Nairobi.

Introduction: I am a student at the School of Nursing Sciences, University of Nairobi pursuing a Master of Science Degree in Nursing. I am conducting a study titled: Assessment of aseptic technique among nurses in management of burns patients at Kenyatta National Hospital, Nairobi. This study is being conducted at Kenyatta national hospital ward 4D and burns unit.

The purpose of this information is to give you details pertaining to the study that will enable you make an informed decision regarding participation. You are free to ask questions to clarify any of the aspects we will discuss in this information and consent form. I will also ask you questions regarding the study before you sign the consent form to ascertain your comprehension of the information provided.

Background and objective: The purpose of this study is to assess the adherence of aseptic technique in management of burns among the in patients at KNH ward 4D and burns unit, with a view of coming up with an association between adherence of aseptic technique and burns wound sepsis .The findings from this study could be used to Improve the understanding on the relationship between adherence to aseptic technique and burn wound infection which will guide on intervention and reduce morbidity and mortality in the long term

Participation: Participation in this study will entail allowing the researcher to observe the nurse performing a wound dressing procedure on you, which will be filled by the observation checklist by the researcher; you will not be subjected to any invasive procedure.

Benefits: There is no direct monetary benefit in participating in this study. However, the results of the study will be useful in facilitating the understanding of the various factors affecting adherence to aseptic technique during burns management and how they can be controlled to aid in the adherence of the aseptic techniques. The findings will be availed to the hospital, other relevant decision makers and stakeholders to aid in putting in place measures that will improve the care given to the inpatient burns patients.

Risks: There are no economic or physical risks to participating in the study. However exposure of the burns wound site will be required to the researcher as the nurse performs the procedure.

Confidentiality: Confidentiality will be maintained and the information you provide will only be used for the intended purpose of the study. In addition, your name will not be required on any forms or used during publication of the final report thus ensuring your anonymity. All materials used during the study will be under lock and key and only the personnel involved in this study will have access to them. Electronic files will be saved on password and fire-wall protected computers.

Voluntary participation: Participation in this study is voluntary. Refusal to take part will not attract any penalty. You retain the right to withdraw from the study without any consequences. You are free not to answer any question during the interview.

Compensation: There is no compensation for participating in the study.

Conflict of interest: The researcher and the supervisors confirm that there is no conflict of interest amongst them.

CONSENT FORM FOR THE PATIENT

If you Consent to Participate in the study please sign below:

I hereby consent to participate in this study. I have been informed of the nature of the study being undertaken and potential risks explained to me. I also understand that my participation in the study is voluntary and the decision to participate or not to participate will not affect my status as a patient in this hospital . I may also choose to discontinue my involvement in the study at any stage without any explanation or consequences. I have also been reassured that my personal details and the information I will relay will be kept confidential. I confirm that all my concerns about my participation in the study have been adequately addressed by the investigator and the investigator have asked me questions to ascertain my comprehension of the information provided.

Participants Signature (or thumbprint).....Date.....

I confirm that I have clearly explained to the participant the nature of the study and the contents of this consent form in detail and the participant has decided to participate voluntarily without any coercion or undue pressure.

Investigator Signature..... Date

For any Clarification, please contact

Chepkok Jacqueline Jerotich

Researcher

Mobile Number: 0722442801

Email: chepkokjackie@yahoo.ca

Or

Dr. James Mwaura, PhD,

Senior Lecturer, Medical- surgical department,

School of Nursing,

University of Nairobi

Mobile Number: 0722790202

Email: jmwaura@uonbi.ac.ke

Or

Mrs. Eunice Ajode Odhiambo, MScN Comm., BScN, Higher dip comm., KRN, FP

Lecturer: community health department

School of Nursing,

University of Nairobi

Mobile Number: 0703417694, 0722358164

Email: ajode@uonbi.ac.ke

Or

The chairman

University of Nairobi-Kenyatta National Hospital ethics and research committee

P.O BOX 19676 CODE 00202

TEL(254-020)-2726300 Ext 44355

Email:uonknherc@uonbi.ac.ke_

Appendix 111: Research instrument: Questionnaire for nurses

Questionnaire no.:

Facility: **KNH**

Ward :

INSTRUCTIONS

- Please do not write your name anywhere in the questionnaire.
- Put a tick (✓) in box next to the right response.
- Where no responses/choices are provided please write the response in the spaces provided.

PART A: DEMOGRAPHIC FACTORS AND FACTORS AFFECTING ASEPTIC TECHNIQUE

Interview Date _____

1. What is your Age in years
2. What is your Level of qualification?
 - a. Certificate level
 - b. Diploma level
 - c. Bachelors
 - d. masters level
 - e. Others.....
3. How many Years of experience in burns management in nursing practice do you have?
 - a. 0 -5
 - b. 6-10
 - c. 11- 15
 - d. 16-20
 - e. Over 21 years
4. Are there barriers to adherence to aseptic techniques in burns management?
 - a) YES
 - b) NOIF YES, specify.....
5. Have you been trained in standard Operating procedures on aseptic technique?
 - a) YES
 - b) NOIf YES, how many times

6. Common Percentage of burns in the ward?

- a) $\leq 10\%$
- b) 11-30%
- c) 31 – 50%
- d) 51 -70%
- e) Above 70%

7. Common Body parts affected?

- a) Head
- b) Upper limbs trunk
- c) Lower limbs
- d) Genitalia

8. Cause of burns?

- a) Dry flame
- b) Hot Water
- c) Frictional burns
- d) Electrical burn
- e) Chemical burn

9. How many days did the patient stay in hospital during wound healing management

- a) 0-7 days
- b) 8-15 days
- c) 16- 22 days
- d) 23-29 days
- e) > 29 days

10. List ways in which burn wound can be infected?

- a) Direct contact
- b) Airborne dispersal
- c) Self contamination
- d) Systemic infections
- e) Others.....

Appendix 1V: Research instrument: Observation check list

(Adopted from WHO 2012)

11. Assessment on the availability of infrastructure

		score
How easily available is the alcohol –based hand rub in the ward	Not available	1
	Available in some patients rooms	2
	Available always	3
Are there adequate supplies for dressing burns wound e.g gauze.crepe bandage	Not adequate	1
	Limited supply	2
	Adequate	3
Is there adequate supply of water in the taps and soap	Yes	1
	no	2
What is the sink- bed ratio	Less than 1per 10 beds	1
	5-per 10 beds	2
	Beside each bed	3

(WHO hand hygiene self assessment frame work 2010)

12. Assessment on the adherence of aseptic technique during procedure of burns dressing.

	Properly done ((√)	Not properly done (x)	Not done
gowning			
Wearing face mask before procedure			
Use of a cap			
Surface disinfection			
Shoe cover			

13. Dressing burns wound preparation Checklist

	Dressing Preparation	Properly done ((√)	Not properly done (x)	Not done
1	Did the nurse introduce him- or herself to the patient?			
2	Did the nurse explain the proposed procedure to the patient?			
3	Did the nurse prepare the material for the dressing beforehand?			
4	Did the nurse warm the cleaning solution?			
5	Did the nurse wash his or her hands before during and after the dressing procedure?			
6	Was the integrity of the patient maintained by the nurse during the dressing procedure?			

14. Assessment and Diagnosis for the burns wound .

	Assessment and Diagnosis	Properly done ((√)	Not properly done (x)	Not done
1	Was an assessment performed with respect to the wound? Was it a cardex (written report) or verbal description?			
2	Did the nurse classify the wound? What was the type of burn and the burn depth described?			
3	Was the location of the wound mentioned, described or considered?			
4	Was the appearance of the wound described using TIME?			
5	Did the nurse wash his or her hands before starting the dressing procedure?			
6	Were the TIME elements identified and managed?			
7	Was the size of the wound described in terms of the TBSA?			

TBSA: total body surface area, TIME: tissue management, infection and inflammation

15. Precision in dressing execution and procedure

	Dressing Execution	Properly done ((√)	Not properly done (x)	Not done
1	Did the nurse prepare the environment?			
2	Did the nurse open the packaging aseptically?			
3	Did the nurse check the expiry dates of the products used?			
4	Was the “dirty” material kept separately from the clean field?			
5	Did the nurse use the prescribed solution?			
6	Did the nurse follow a logical sequence throughout the procedure?			
7	Did the nurse maintain the aseptic technique throughout the procedure?			
8	Did the nurse take complaints of pain by the patient into consideration?			

16. Nursing Outcome

	Outcome and Evaluation	Properly done ((√)	Not properly done (x)	Not done
1	Did the cardex (documentation) reflect the nursing process with regard to wound management?			
2	Was the management based on the identification, recording and treatment of TIME- related problems?			
3	Were referral pathways followed (i.e. referrals made to a physiotherapist, surgeon or counsellor, if needed)?			

TIME: tissue management, infection and inflammation, moisture imbalance and epithelial edge of the wound

17. Waste segregation assessment

	Present (2)	Not present (0)
Are three segregation bins Provided?		
Are they color coded? red, black, yellow		
Are the bins provided with a foot pedal?		
Are the bins labeled correctly as indicated below? Red (highly infectious waste) Yellow (infectious waste) Black (general waste)		
Are safety boxes provided?		
If yes above were they three quarters full[also above 3/4 full applies]		
Are there containers with disinfectant in the room for instrument disinfection?		
Do you see Standard Operating procedures for handling blood/waste spillages? in the room?		
Do you see segregation posters?		

18. Complications

	Day 1	Day 3	Day 14	Day 21	Outcome (recovery, persistent complication or mortality)
Electrolyte imbalance					
Hypovolaemia shock					
Infection					
Renal failure					
Pneumonia					
Anaemia					
Others					

Appendix V: Approval letter from KNH/UON-ERC



UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
Tel:(254-020) 2726300 Ext 44355



KNH-UON ERC
Email: uonknh_erc@uonbi.ac.ke
Website: <http://www.erc.uonbi.ac.ke>
Facebook: <https://www.facebook.com/uonknh.erc>
Twitter: @UONKNH_ERC https://twitter.com/UONKNH_ERC



KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/200

8th June, 2016

Chepkok Jacqueline Jerotich
Reg. No.H56/75069/2014
School of Nursing Sciences
College of Health Sciences
University of Nairobi

Dear Jacqueline

REVISED RESEARCH PROPOSAL- ASSESSMENT OF ASEPTIC TECHNIQUE AMONG NURSES IN MANAGEMENT OF BURNS PATIENTS AT KENYATTA NATIONAL HOSPITAL, NAIROBI (P173/02/2016)

This is to inform you that the KNH- UoN Ethics & Research Committee (KNH-UoN ERC) has reviewed and **approved** your above proposal. The approval period is from 8th June 2016 – 7th June 2017.

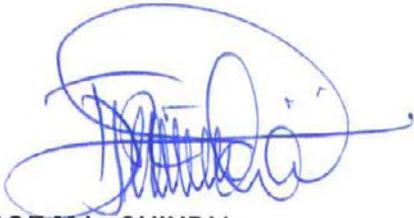
This approval is subject to compliance with the following requirements:

- Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH-UoN ERC before implementation.
- Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
- Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
- Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
- Clearance for export of biological specimens must be obtained from KNH- UoN ERC for each batch of shipment.
- Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

For more details consult the KNH- UoN ERC website <http://www.erc.uonbi.ac.ke>

Protect to Discover

Yours sincerely,



PROF M.L. CHINDIA
SECRETARY, KNH-UoN ERC

- c.c. The Principal, College of Health Sciences, UoN
 The Deputy Director, CS, KNH
 The Assistant Director, Health Information, KNH
 The Chair, KNH- UoN ERC
 The Director, School of Nursing Sciences, UoN
 Supervisors: Dr. James Mwaua, Mrs. Eunice Ajode Odhiambo

Appendix V1: Approval letter from Kenyatta National Hospital Management

KNH/R&P/FORM/01



KENYATTA NATIONAL HOSPITAL
P.O. Box 20723-00202 Nairobi

Tel.: 2726300/2726450/2726565
Research & Programs: Ext. 44705
Fax: 2725272
Email: knhresearch@gmail.com

Study Registration Certificate

1. Name of the Principal Investigator/Researcher
..... CHEPKOK JACQUELINE JEROTICH
2. Email address: chepkokj@yahn.co.ke Tel No. 0722442801
3. Contact person (if different from PI).....
4. Email address: Tel No.
5. Study Title
..... ASSESSMENT OF ASEPTIC TECHNIQUE AMONGST
..... NURSES IN MANAGEMENT OF BURNS
..... PATIENTS AT KNH, NAIROBI
6. Department where the study will be conducted SPECIALIZED UNITS: BURNS UNIT AND 4D
(Please attach copy of Abstract)
7. Endorsed by Research Coordinator of the Department where the study will be conducted.
Name: Signature Date
8. Endorsed by Head of Department where study will be conducted.
Name: Dinah N. Moga Signature [Signature] Date 13/6/16
9. KNH UoN Ethics Research Committee approved study number P173/02/2016
(Please attach copy of ERC approval)
10. I JACQUELINE CHEPKOK commit to submit a report of my study findings to the Department where the study will be conducted and to the Department of Research and Programs.
Signature..... [Signature] Date 08 June 2016
11. Study Registration number (Dept/Number/Year) Burns / 3 / 1016
(To be completed by Research and Programs Department)
12. Research and Program Stamp _____

All studies conducted at Kenyatta National Hospital **must** be registered with the Department of Research and Programs and investigators **must commit** to share results with the hospital.



Appendix V11: Letter from Kenyatta National Hospital Nursing Administration



KENYATTA NATIONAL HOSPITAL
P. O. Box 20723, 00202 Nairobi.

DEPUTY CHIEF NURSE-Administration

Ref: KNH/DCN/43(b)/Vol.II/54

Date: 4th February, 2016

THE NO. OF NURSES IN BURNS UNIT AND WARD 4D

As per your letter dated 4th February 2016, requesting for the number of nursing staff in Burns unit and ward 4D.

Kindly Find the list as tabulated below.

	Department	No. of nurses	Nurses in Training	External Nurses on Locum
1.	Burns Unit	24	4	None
2.	Ward 4D	26	1	3

Thank you


R. A. Mutua (Mrs)
DEPUTY CHIEF NURSE-Administration

Appendix V111: Time frame Ghant Chart

Activity	Nov 2015	Dec 2015	Jan 2016	Feb 2016	Mar 2016	April 2016	May 2016	June 2016	July 2016	Aug 2016
Proposal writing	█									
Ethics clearance				█						
Correction of final proposal and forwarding to KNH/ERC				█						
Rescruitment and training of research assistant						█				
Printing of research instruments							█			
Data collection								█		
Data editing, coding and validation								█		
Data analysis and report writing								█		
Defense of project report									█	
Dissemination ,submission and publication										█

Appendix 1X: Budget

	ACTIVITY DESCRIPTION	ITEM	UNIT OF MEASURE MENT	UNIT COST (KSH)	TOTAL (KSH)
LITERATURE REVIEW	STATIONARIES	Foolscap papers	2reams	@250	500
		Printing papers	2reams	@400	800
		A4 notebooks	5	@100	500
SUBTOTAL					1,800
RESEARCH	PRETESTING	PROPOSAL TYPING	300	@2	600
		Proposal printing	200	@5	1,000
	QUESTIONARES	Proposal photocopying	400	@2	800
	Data Collection	Transport	30days	@500	1,500
	Data processing and analysis				30,000
SUBTOTAL					33,900
PERSONNELS	KNH ethics committee				2000
	KNH request for data				500
	Allowance for biostatistician		1	20,500	20,500
	Allowance for research assistance for the whole period		3x30	500	45,000
	Research Assistant training		1x3	1,000	3,000
	Allowance for pretesting research assistance		1x3	500	1,500
SUBTOTAL					86,000
GRAND TOTAL					121,700.00



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