ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF NURSING AND MIDWIFERY

DEPARTMENT OF NURSING

SURGICAL SITE INFECTION PREVENTION PRACTICE, AND ASSOCIATED FACTORS AMONG NURSES IN ARMED FORCE COMPREHENSIVE SPECIALIZED HOSPITAL ADDIS ABABA, ETHIOPIA. 2023

BY:

BIZUAYEHU TADESSE (BSC.N)

A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES, SCHOOL OF NURSING AND MIDWIFERY AS A PARTIAL FULFILLMENT FOR THE REQUIREMENTS OF MASTER OF SCIENCE DEGREE IN ADULT HEALTH NURSING

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TITLE PAGE

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I, the undersigned MSc student, declare that I have submitted my original work on surgical site infection prevention practice and associated factors among nurses in armed forces comprehensive specialized hospital in Addis Ababa, Ethiopia, in 2023, for the examination.

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This thesis by Bizuayehu Tadesse is accepted in its present form by the board of examiners as satisfying thesis requirement for the degree of masters in adult health nursing.

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STATEMENT OF DECLARATION

I declare and affirm that this thesis is entirely my own work by signing below. I prepared, collected, analyzed, and finished this thesis in accordance with all scholarly ethical guidelines. The thesis has academic content that has all been acknowledged with citations. I certify that I properly credited and referenced each and every source used in this essay. Every attempt has been taken during the thesis' preparation to prevent plagiarism.

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ABBREVIATION

AAU	Addis Ababa University
AFCSH	Armed Forced comprehensive Specialized Hospital
AOR	Adjusted odds ratio
COR	Crude odds ratio
CDC	Centre of disease control
DUCHS	Défense university college of health science
HAI	Health care associated infection
IP	Infection prevention
IRB	Institutional review board
LIMICs	Low- and middle-income countries
PI	Principal Investigator
NHSNs	National health care safety networks
SCIP	Surgical care improvement project
SD	Standard division
SIR	Standardized infection ratio
SSIs	Surgical site infection
USA	United states of America
WHO	World health organization

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Background: A Surgical site infection is a preventable hospital-acquired infection. Surgical site infections remained a significant cause of morbidity, prolonged hospitalization, and death. Globally, SSI rates have been estimated to range from 2.5% to 41.9%, with much higher rates in developing nations. Surgical site infection is the most expensive health-related infection, costing $3.3 billion annually. Multiple studies were conducted in Ethiopia on it; however, these studies did not delve into the institutional factors that affect nurses surgical site infection prevention practice.

Objective: To assess the surgical site infection prevention practice, and associated factors a mong nurses in the armed force comprehensive specialized hospital, Addis Ababa, Ethiopia.

Method: An institution-based cross-sectional study was conducted on 284 nurses in the Armed Forces comprehensive specialized hospital from February 27–March 27, 2023. A modified, pretested, and structured self-administered questionnaire was used to measure surgical site infection prevention practice and factors related to it. A cluster and simple random sampling methods were used. Epi-data 3.1 and SPSS Version 26 were used to enter the data into the computer and Bivariate and multivariate regression analyses.

Result: The two hundred and eighty-four nurses responded to the questionnaire with a 100% response rate. One hundred sixty-three (57.4%) of them were males. The mean age was 31 years old. The majority of participants (91.9%) held a BSc degree. Just 57.4% [95% CI (.5161–.6318)] of the participants were found to have good practice in surgical site infection prevention. At a p-value of 0.05, the participants age [AOR=2.165CI (1.120–4.186)] and use of the IP guideline [AOR=.421CI (.212–.835)] were significantly associated with the nurse's practice.

Conclusion and recommendation: Nurses' knowledge and practice in surgical site infection prevention have been compromised due to several factors. Updating the nurse's knowledge and practice to use infection prevention guidelines is essential for preventing surgical site infections.

Keywords: Surgical site infection, Nursing practice, Factors Associated, Infection prevention.

1. INTRODUCTION

1.1. Background of the study

According to surgical practice, infections that occur within 30 days of an operation are referred to as surgical site infections (SSIs), which may last longer than 30 days (1). With over 687,000 infections and 72,000 deaths each year, health care-related infections (HAIs) are a substantial cause of mortality and morbidity in the United States, with associated expenditures in the billions of dollars. According to the Centers for Disease Prevention and Control (CDC), approximately one in 25 patients will acquire a HAI (2). The standardized infection ratio (SIR) for all infections dropped by around 7%. The National Health Care Safety Network (NHSN) operative procedure categories combined were reported between 2015 and 2019. SIR related to the Surgical Care Improvement Project (SCIP) has also seen a 9% decrease. The HAI data results were published in the NHSN's HAI Progress Report (3).

SSIs continue to be a major cause of morbidity, prolonged hospitalization, and death despite improvements in infection control practices, including better operating room ventilation, sterilization techniques, barriers, surgical technique, and the availability of antimicrobial prophylaxis. The most expensive HAI type, SSI, is expected to cost $3.3 billion annually and is linked to around 1 million more days spent in hospitals (4). Globally prevalence of SSI is range from 2% - 20%, and in Ethiopia 12.3% -25.2% (5, 6).

A multidisciplinary strategy is necessary to decrease SSIs. By using surgical safety checklists before and during surgery, as well as by providing proper post-operative wound care and detailed discharge planning, nurses, as the patients' primary caregivers, may assist surgical patients in preventing SSI. As a result, all nurses must make sure that crucial measures to lower risks are carried out for every patient on every occasion in order to avoid SSIs, and improving nurses' knowledge and quality of practice is an essential part of preventative efforts (7, 8)

1.2. Statement of the problem

Globally, infections at the surgical site and the added cost of SSI ranged between $174 and $29,610 in LMIC countries and between $21 and $34,000 in European nations (given in 2017 international dollars) (9). This price depends on a number of variables, including the patient's age and the kind of surgery done.

The most prevalent kind of infection connected with healthcare is infection at the surgery site; this is a common adverse effect of surgical procedures. In comparison to high-income countries, in low- and middle-income nations, the prevalence of HAI is substantially (at least 2-3 times) greater. In developing countries, 15 out of every 100 hospitalized patients at any given moment will contract at least one HAI (7, 10).

Twenty percent (20%) of all HAIs in hospitalized patients are surgical site infections, and each SSI is linked to an extra 7–11 postoperative hospital days. Patients with SSIs have a 2–11 times greater mortality risk than surgical patients without SSIs, and 77% of those fatalities are directly attributable to the SSI (7, 10). According to reports, a single SSI in the USA may cost anywhere between $12,000 and $35,000 (11).

Globally, SSI rates have been estimated to range from 2.5% to 41.9%, with much higher rates in developing nations. Additionally, anaesthesia-related deaths are 1000 times more common in developing nations than in industrialized nations, and surgical mortality is ten times greater in developing nations (12). The anticipated SSI prevalence rate in Africa during the previous 20 years ranged from 12% in Algeria to 31% in Nigeria, according to a 2014 WHO assessment (13). In underdeveloped countries, the cumulative incidence of SSI rates ranged from 0.4 to 30.9 per 100 patients and from 1.2 to 23.6 per 100 surgical procedures, according to a recent meta-analysis of 220 worldwide studies (14).

According to studies, the prevalence of SSIs in Ethiopia ranged from 10.9% in Bahir Dar to 11.1% in Harar and 19.1% in Hawassa (15-17). Ethiopia has a prevalence rate of 75% for SSI and isolated bacteria from 102/123 (82.92%) SSI patients have multiple drug resistance to hospital-use antibiotics. The prevalence of antibiotic resistance in patients with aerobic bacterial post-surgical wounds was examined in Mekelle, Ethiopia. A wound sample was obtained from 128 individuals who had clinical symptoms of post-surgical wound infection. And the findings

showed that 102/123 (82.92%) of the patients with SSI had isolated bacteria that were multi-drug resistant to the widely prescribed antibacterial drug in the hospital, with the prevalence rate of SSI verified by culture being 75%.(18).

In several nations, studies on nurses' prevention of SSI knowledge and practice have been conducted. It was found that nurses in Pakistan and Bangladesh have limited knowledge of how to prevent surgical site infections (19, 20). And in Jordan, nurses' general knowledge of scientifically supported recommendations for the prevention of SSIs was low (21). Research conducted in the Amhara regional state of Ethiopia revealed that only 40.7% of participants had a sufficient understanding of SSI prevention (22).

In studies that also sought to identify the factors influencing the nurse's knowledge and practice (22, 23), age, sex of participants, service experience, completing training on infection prevention measures, and the number of credit hours spent in surgical training courses were identified as influencing the nurse's knowledge. Respondent age, gender, total year of service, educational level, and involvement in IP training initiatives were all identified as practice-related factors in relation to the prevention of SSIs (22-24). However, lack of knowledge, insufficient resources and budgets, insufficient performance monitoring systems, and the absence of surveillance systems were also identified (25).

These studies did not, however, delve into the institutional elements that affect nurses' SSI prevention knowledge and practice. As a result, the goal of this study is to evaluate nurses' performance in preventing surgical site infections at the Armed Forces Comprehensive Specialized Hospital in Addis Ababa, Ethiopia, as well as to discover factors that are related to such practice.

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1.3. Significance of the research.

The development of an infection at the site of surgery, a common kind of infection associated with healthcare, is the most common postoperative result. Ethiopia is one of the poorest countries where the prevalence and incidence of surgical site infections are much greater than in industrialized countries. These characteristics are associated with a high incidence of risk factors that can be changed and that may have been prevented if the surgical team had followed the most recent guidelines for preventing surgical site infections.

Because nurses spend their time is spent mostly with patients before and after surgery and because infection control is one of Ethiopia's main health strategies, nurses are primarily responsible for preventing surgical site infections. The government has therefore given it a monetary value, notably in the prevention of illnesses acquired while receiving healthcare, such as surgical site infections.

Although many studies have been conducted in our country on this topic, they do not demonstrate the extent of the problem or the work done in the prevention of surgical site infection in military hospitals. It is well known that the surgical cases at the National Defense Hospital differ from those at other hospitals in our country, both in number and type. The National Defense Forces are exposed to a variety of surgical cases as a result of their national duty and the places where they work. Because of the high burden among the health provider institutions under the Ministry of Health, Hope that it will solve this problem in some way due to a lack of research conducted in the centers or by other stakeholders.

In general, no study on this topic is available under the Health Directorate of the Minister of National Défense, and this study differs based on research done in our country, either in the location or the section of society where the study is conducted. Therefore, the goal of this study was to assess nurses' practice in preventing surgical site infections as well as pinpoint risk variables. So, health professionals, Défense Health Directorate directors, the College of Health Science at Défense University, program managers, and others will thus profit from the study's findings. It may also be utilized. as a resource for policymakers of the Ministry of Défense and Health as well as other researchers.

2. LITERATURE REVIEW

2.1. Review of Theoretical Viewpoints on Surgical Site Infection and Supporting Data

The most expensive HAI type, SSI, has an estimated yearly cost of $3.3 billion, increases hospital costs by more than $20,000 each admission, and lengthens hospital stays by 9.7 days (26). The attention system incurs enormous financial expenses as a result (27). Despite having a lower frequency in high-income nations, SSI is still the second most prevalent HAI type in Europe and the United States of America. WHO had produced 29 guidelines for avoiding SSIs to guarantee that every patient receives high-quality care regardless of the resources available (28).

Surgical site infection rates have not decreased substantially despite the broad availability of evidence-based recommendations. Especially among nurses who can take the lead in initiatives aimed to lower the incidence of SSIs (29) this is probably the result of inadequate understanding of and/or non-compliance with acceptable procedures (30). According to various studies, nurses' knowledge of SSI prevention was insufficient and constrained (31). showed that the nurses possessed the necessary knowledge; 92.4% of respondents reported practicing proper hand washing before to operation and 86.1% of surgical nurses on the ward consistently wash their hands thoroughly before entering their duties, and they tend to treat patient wounds. Nursing had strong protocols for avoiding surgical site infections, notwithstanding Considering that most of studies reported that nurses lacked comprehension (27). Greek studies indicated that the full importance of the SSI time occurrence was not well understood (32).

2.2. Nurses Practice of Preventing Infections at Surgical Sites.

There was a cross sectional study done in Pakistan, according to the study, staff nurses in Pakistan generally follow appropriate practices for preventing and controlling surgical site infections. However, there was a negative correlation between nurses' knowledge and SSI preventive practice. (AOR = -.562, P = 0.000)(19). According to a descriptive cross-sectional study conducted in Bangladesh, 98.3% of nurses gave their SSI prevention practices a good rating, with a minimum score of 80% and a maximum score of 96%. Additionally, a marginally negative connection (AOR = -.18, p = 0.04) between nurses' practice and knowledge of SSI prevention was found (20).

Only 28% of nurses regularly employed preoperative shaving procedures for SSI prevention, according to another study done in the Republic of Bangladesh, whereas 44.5% of nurses regularly implemented SSI preventative strategies (33). In addition, only 37.08% of nurses, as opposed to 62.92% of nurses, consistently gave a preoperative preventative antibiotic before surgery. Just 51.37% of nurses claimed to always follow proper hand hygiene, while only 46.42% of nurses claimed to always clean their skin before surgery (33). This study also identified the four key variables affecting nurses' practice. These included a dearth of knowledge, a lack of financing and resources, inadequate evaluation tools, and a scarcity monitoring networks for SSI prevention (33).

Undesirable levels of practice were discovered in Nigeria for SSI prevention. Just 15.1% of the participants reported sometimes neglect washing their hands after touching anything that was plainly unclean; this further showed a high level of compliance with surgical wound prevention standards (34). Additionally, 71.4% of respondents said they frequently changed their dressings using the sterile method, compared to 28.6% who said they did it only occasionally. Additionally, it was revealed nearly half (45%) of the subjects claimed to sometimes change the wet surgical dressing as often as was practical. Once more, only 22.3 and 27.3% of respondents indicated that they regularly or very frequently wore hand gloves along with additional protective gear, whereas 34.9% reported washing their hands both before and after placing sutures in surgical incisions. Only 17.6% of the respondents said they were generally safely careful when discharging care for surgical wounds, but 30.7% said they were frequently cautious, and 6.3% said they weren't at all. Additionally, it demonstrated that knowledge and practice had a positive and moderate connection (AOR = 0.570, p = 0.000–0.01). However, a strong link between SSI prevention practices and attitudes was discovered.(31, 35).

More than half of the subjects in Tanzania research (57.3%) had poor post-operative wound management practices. Nurse having Fifteen to twenty-four and twenty-five to thirty-four years of work experience received scores of 14.5 and 16.38, respectively. Participants between the ages of 35 and 44 had higher scores (16.65%). However, there was no discernible variation in practice results across participants in various age groups. Compared to other students, nursing students performed well and achieved higher test scores. Diploma-holding nurses offered insufficient post-operative wound care, whereas certificate-holding nurses displayed

unacceptable behaviours. When compared to with a diploma nurse, student nurses significantly outperformed them in terms of practice (P = 0.003). Additionally, as compared to nurses with certificates, undergraduate nurses shown better post-operative wound care practices (P = 0.006).(24).

According to research done in Ethiopia, 48.7% of nurses had good practices for preventing surgical site infections. It was discovered that SSI prevention practice was substantially correlated with age, service year, participants sex, taking part in training on prevention of infections measures, and educational achievement. However, only a significant link between the age of participants, gender, level of education, and level of practice was discovered in the multivariate analysis. This study found that nurses with diplomas were also found to be somewhat more likely to practice infection prevention measures at the surgical site than nurses without diplomas. People over 30 were also found to be a bit more likely practice prevention of surgical site infection actions than people under 30 (AOR = 1.79, 95% CI). In comparison to male nurses, female nurses had almost twice as much good practice (AOR = 2.35, 95% CI) (22).

Therefore, it is highly advised that nurses increase their practice and knowledge in accordance with the most recent evidence-based recommendations for preventing surgical site infection (10, 21, 36). Consequently, it is generally agreed that improving nurses' knowledge and skills in SSI prevention techniques through training and other methods is a crucial step in lowering the incidence and cost of SSIs.

2.3. Factors Relating to the Practice of Preventing Surgical Site Infections.

At the King Abdul-Aziz University Hospital in Saudi Arabia, a cross-sectional study involving 119 doctors was carried-out. 92 (77.3%) of the total responders were intern physicians, 16 (13.4%) were residents, and 11 (9.2%) were specialists. And 66 (55.5%) of the clinicians were familiar with the SSI definition. Only 30 (25.2%) doctors, or one-quarter, were informed of the prevalence of SSI. Additionally, this study found that for SSI, 8 doctors (6.7%) had strong knowledge, 75 (63.0%) had fair understanding, and 36 (30.2%) had low knowledge (34).

Jordan was found to have a low degree of nurse understanding of scientifically validated suggestions for SSI prevention. There was shown to be a statistically significant correlation between nurses' age, total nursing professional experience, time spent in surgical units, the

amount of credit spent in surgical-related courses, income per month, and knowledge level. (P-value 0.01) with each other. It was also discovered a significant knowledge gap existed between nurses who were enrolled in specialized surgical-related training courses and those who were not. The years of nursing experience & the number of credit hours nurses had taken in surgically related training courses were the two most important predictors of nurses' knowledge (P = 0.001) (21).

In Nigeria, nurses demonstrated both a high level of understanding furthermore a distaste towards SSI prevention. The findings showed a positive and moderate relationship between attitudes and knowledge on SSI prevention. [(AOR = 0.695, p = 0.000<0.01)] (31).

Just under fifty percent (40.7%) among those taking part in the study in Ethiopia's Amhara region knew how to avoid SSI (22). Gender identity, service year, and participation in prevention of infection training were shown to be substantially connected with the knowledge level of nurses regarding the prevention of SSIs. [AOR = 3.22, 95% CI. (2.09-4.95]. Additionally, it showed that male individuals were nearly three times more likely to have high knowledge than female participants. [AOR = 1.81, 95%, CI (1.12-2.94)]: Compared to nurses with five years or less of experience, nurses with over five years of experience have almost two times the odds of having strong knowledge. The [AOR = 1.95, 95% CI (1.27-2.99)]: There are about twofold greater odds of nurses with infection prevention training having good knowledge regarding SSI prevention than those without (22)

Factors Related to the Use of SSI Prevention Activities. In the bivariate analysis, it was shown that the participants' age, service years, sex, and whether or not they participated in training on prevention of infection procedures were significantly connected with the practice of surgery site infection control activities. Only the individuals' age, gender, and level of education were shown to be substantially linked in the multivariate analysis (22)

Compared to male nurses, the likelihood that female nurses would engage in behaviours to prevent surgical site infections was nearly two times higher [AOR = 2.35, 95% CI: (1.58, 3.50)]. Nurses 30 years of age or older were approximately twice as likely to undertake surgical site infection prevention activities compared to nurses under 30[adjusted odds ratio = 1.79, 95% CI:(1.08, 2.97)]. Unlike nurses who have a B.Sc. or higher nurses with a diploma were about twice

as likely to practice surgical site infection control actions [AOR = 2.26, 95% CI: (1.08, 4.76)] (22).

Study results from the western part of southern nations, and peoples' region of Ethiopia show that 281 (69.9%) of the participants said their working units had access to surgical supplies. However, only 65 participants (16.2%) indicated that their working units have SSI prevention guidelines. About 80% of nurses who said that there were guidelines available in their units said that they were using the guidelines to keep up with new information.(37).

2.4. Conceptual framework of the Research

The conceptual framework identifies factors affecting the level of a nurse's practice as age, sex of participants, marital status, educational level, participation in prevention of infection training, monthly income, and service that is year in the surgical unit (22, 23, 25) Other factors include a lack of knowledge, a lack of resources and budgets, a lack of competency systems for monitoring, and a shortage of surveillance systems (33).

Conceptual framework

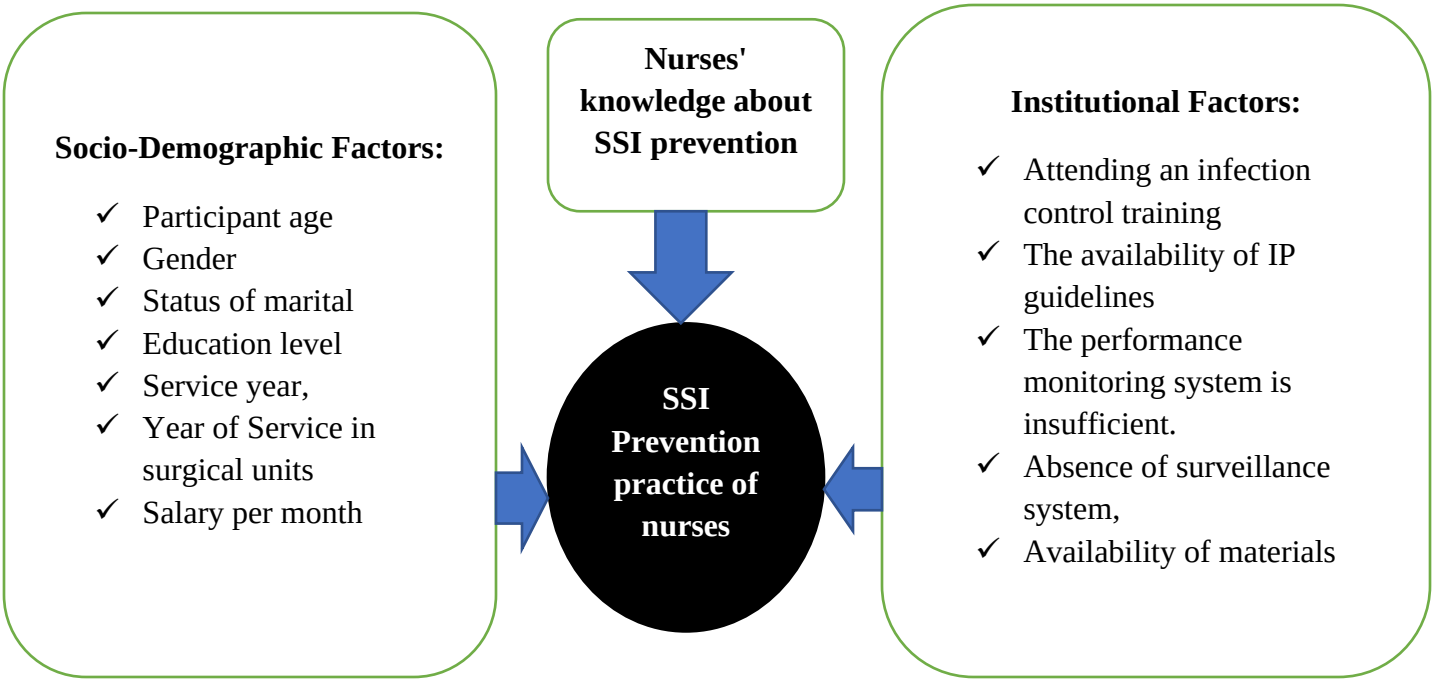

Figure 1: Conceptual framework for the study to assess nurses working at AFCSH's practices for preventing surgical site infections and related factors Addis Ababa, developed by reviewing different literature.2023(17, 18, 37-39).

3. OBJECTIVES OF THE STUDY

3.1. General Objective

The general objective of this study was to assess surgical site infection prevention practice, and associated factors among nurses in the Armed Force Comprehensive Specialized Hospital in Addis Ababa, Ethiopia, 2023.

3.2. Specific objective

The specific objectives of this research were:

1. To determine the degree of SSI preventive practice of the nurses employed in the in the armed forces comprehensive specialized hospital, and
2. To identify factors that have a direct effect on nurses' practice to prevent surgical site infections.

4. METHOD AND MATERIAL

4.1. Study area

Addis Ababa is the capital city of Ethiopia, which is 137 years old and has a surface area of 527 square kilometers at 2355m above sea level on a plateau surrounded by hills and mountains.

The total population is 3,384,569, according to the 2007 census. In 2007, the male population was 1.31 million and the female population was 1.43 million. The population density is estimated to be near 5,165 individuals per square kilometers.

The study was conducted at the Armed Forces Comprehensive Specialised Hospital, Addis Ababa, Ethiopia. This hospital was formerly known as Princess Tsehai Memory Hospital. The hospital is in memory of his daughter, Prince Tsehai Haila Selasie, who died of illness in 1942.

At the beginning of the Ethno-Italian War's course, about 71 years ago, an Army force compressive specialized hospital was built in Addis Ababa. It is situated in Lideta's westernmost sub-city, Kebeles 2 and is far from the Federal Court of Lideta, 1.5 kilometers west. 8 command hospitals use this hospital as a referral center; Additionally, this institution serves as a referral hub for 25 clinics and health facilities in the Addis Ababa area.

The hospital has 600 beds, about 8 departments, and effective infrastructure, instruments, and human resources. It offers medical and surgical services in paediatrics, obstetrics and gynaecology, psychiatry, and all human immune-related services in different departments.

4.2. Study design and period.

An institution-based cross-sectional study was conducted from February 27 to March 27, 2023, to assess nurses ‘practice and associated factors regarding the prevention of surgical site infection at the AFCSH in A.A, Ethiopia.

4.3. Population.

4.3.1. population of source

The whole nurses working in an Armed Forces comprehensive specialized hospital.

4.3.2. Population of the study

The whole nurses who attended and worked in AFCSH during the time of study fulfilled the inclusion criteria and were included.

4.3.3. Sample Population

All of the nurses in the sample populations were selected at random from the sub-departments of AFCSH. Addis Ababa, Ethiopia.

4.4. Criteria for Inclusion and Exclusion

4.4.1. Criteria for Inclusion

The whole nurses employed in AFCSH, professional nursing, and having worked for at least six months

4.4.2. Criteria for exclusion

- Nurses who were not willing to participate in the study
- For annually rested and seriously sick nurses during the data collection periods

4.5. Study variable

4.5.1. Dependent Variables

- SSI prevention Practice

4.5.2. Independent Variables

- Socio demographic characteristics (Age, sex, Marital status, Religious, educational status, total service year, service year in surgical unit, salary per month)
- Knowledge
- Institutional factors:
    - Attending an infection control training
    - The availability of IP guidelines

- The performance monitoring system is insufficient.
- Absence of surveillance system,
- Availability of materials

4.6. Sample size determination

The formula for calculating a single population percentage was used to calculate the necessary size. As a result, the sample size was determined using the formula for a single percentage as follows:

$$n^o = Z\alpha/22 * p*(1-p) / d2$$

Where:

Z = 1.96, D = 0.05, P = (a single population proportion) = 48.7, and d = (marginal error) represent the standard value for the 95% confidence interval. n^o = (the minimum required sample size), which is taken from a prior study of a similar nature carried out in the Amhara regional state (22), n^o = (the minimum required sample size), so n^o = (1.96)2 *(0.487) (0.513)/ (0.05) 2 =384, and since the total population size was less than ten thousand, using the correction formula, the final sample size was calculated as follows: n = (final sample size) =n^o/(1+n^o/N) =384/ (1+384)/800) =259; N was the population size, which was the total number of nurses working in AFCSHs found in Addis Ababa, Ethiopia. (N= 800). And 10% for the non-respondent rate, the final sample size was 284 nurses.

4.7. Sampling technique

cluster and simple random sampling techniques were used in this study. The nurses of an armed forces comprehensive specialised hospital were clustered into eight groups based on departments. Then the respective sample size was calculated for each department based on a probability proportional to the population size in each department. Finally, the study units were selected from each unit (sub-department) of nurses in the study using a simple random sampling technique.

Proportional allocation

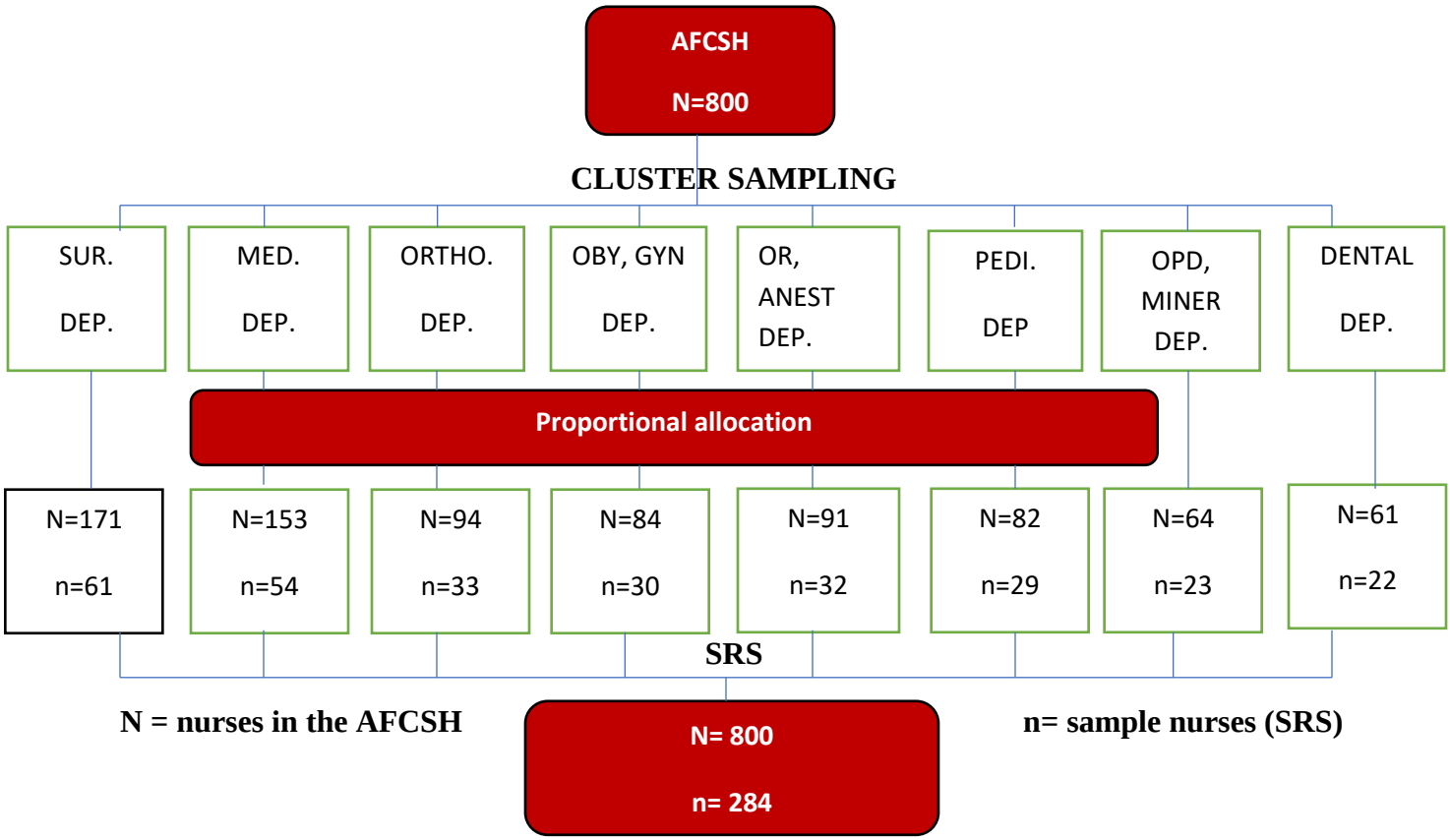

Figure 2:Schematic Representation of Sampling Procedures used for the surgical site infection prevention practice, and associated factors among nurses in AFCSH Addis Ababa, Ethiopia, January 2023.

4.8. Data Collection technique and tools

Data were gathered using questionnaires administered by oneself that were modified and incorporated from the various research studies. There were 65 questions in all, divided into three sections: the first section (the demographic part) had 13 questions, and the second section (the knowledge part) had 25 questions. The third section (the practice part) had 27 questions. These self-administered questionnaires were provided to the respondents by the data collector from February 27–March 27. The data gatherers were described. All participants agreed in writing to

take part in the research and received an explanation of the study's objectives. All participant data was kept confidential. The questionnaire and the data collection procedure were all checked by supervisors to ensure the completeness of the information.

4.9. Data Quality Control

To ensure the quality of the data, structured questionnaires were used. In each department, the aim of the study was clearly explained to the research subjects before they filled out the questionnaire. and the data collectors and supervisors were trained for one day on how to facilitate the data collection process and prevent errors. The questionnaire was pretested (5% of the total sample size) at the Bella Hospital branch of AFCSH in Addis Ababa, Ethiopia. Each day throughout the data collection period, supervisors and the investigation team went over the questionnaires and made sure they were accurate, thorough, and consistent. In addition, further information was routinely gathered in the field. Each day ends with, the data collection questionnaire was reviewed. The investigator also entered the data carefully after cleaning it.

4.10. Data Processing & Analysis

Epi-data 3.1's statistical application was used to code and input the data before it was transferred to SPSS 26 version for additional analysis. Then it was calculated what the mean, median, deviation from the mean, and percentage were. The link between the dependent and independent variables was examined using a bivariate logistic regression analysis. A multivariate logistic regression study was carried out to ascertain the relative impact of independent factors on outcome variables. A confidence interval of 95% was used to interpret the data after an odds ratio was computed to assess the degree of relationship between both dependent and independent variables. To declare a statistically significant association between independent and dependent variables, a P-value of less than 0.05 was used as the cut-off point. Finally, the outcome is presented using text, frequency, figures, tables, and graphs.

4.11. Operational definition and measurement of variables

4.11.1. Operational definition

- Good knowledge: refers to the participant nurse's ability to seek and interpret information from a theoretical and practical perspective based on evidence.
- Poor knowledge: refers to nurses' lack of information needed for a thorough understanding of a disease process, recommended patient care, and the inability to make informed choices or carry out tasks in alignment with healthcare.
- Good practice: refers to a deliberate, logical, and rational problem-solving process whereby the practice of nursing is performed systematically based on recommended skills of practice.
- Poor practice: refers to nurses' failure to provide a good standard of care and support for their patients. It occurs when nurses ignore the rights of patients and can cause harm.
- Infection-is invasion and multiplication of microorganisms in the body tissue.
- Surgical site infection (SSI) are infections that may affect the wound or deep tissue at the site of the operation and occur up to 30 days after the intervention of surgery.
- Infection prevention: practice take or aimed at stopping spread infection among humans.
- Surgical site infection prevention**:** are defined as Preventing surgical site infections before, during, and after surgery.
- Nurses: are those who have completed their undergraduate studies and hold a college diploma or higher in the nursing field.

4.11.2. Measurement of variables

- Good Knowledge: Participants who respond with a mean or higher score on knowledge-related questions about SSI prevention (38).
- Poor knowledge**:** Participants who provide answers to knowledge-related questions about SSI prevention below the mean score.
- Good Practices: Participants who respond with a mean or above-mean score on practice questions about SSI prevention (38).
- Poor practice: rating Participants who respond poorly to practice-related questions on SSI preventive practices.

4.12. Ethical considerations.

The Research Integrity and Ethics Committee of the Department of nursing at AAU Health Science College granted ethical permission. The participants received information about the study's objectives and their options to participate or not. All participants provided informed consent, and the data they provided was kept confidential

4.13. Plan for Dissemination of findings

The result of the study was presented using frequency tables, charts, and figures. The copies of the study results were submitted to the AAU College of Health Science Department of Nursing and Midwifery IRB, AFCSH, Défense Health Directorate, DUCHS, and the federal Minister of Health.

5. RESULT AND DISCUSSION

5.1. Result

5.1.1. Sociodemographic Characteristics of Respondents

Two hundred and eighty-four respondents from the Armed Forces Comprehensive Specialized Hospital completed the questionnaire and submitted it, achieving a response rate of 100%. A total of 163 (57.4%) of them were male. The mean age score was 31 years old. 138 (48.5%) of the study's participants are married. The vast majority of research subjects (91.9%) have a BSc or MSc, followed by nurses with a diploma (8.1%). The participants' mean monthly income was 6,000 Ethiopian birr. Only 161 individuals in the study (56.7%) claimed to have received basic training in infection prevention techniques (Table 1).

Table 1:lists the sociodemographic background of nurses who worked at Ethiopia's capital, Addis Ababa, in 2023 (n = 284), along with relevant institutional factors.

Variable	Categorise	Frequency	Percent
Age	< 31 years	172	60.6
	≥ 31 years	112	39.4
Sex	Male	163	57.4
	Female	121	42.6
Educational status	Diploma	23	8.1
	Degree and above	261	91.9
Total monthly Income	< 6000.00 ETB	165	58.1
	≥ 6000.00 ETB	115	40.5
Total Work Experiences	≤ 5 years	182	64.1
	> 5 years	102	35.9
Work Experiences in surgical unit	≤ 3 years	192	67.6
	> 3 years	92	32.4
	Others	99	34.9
Ever received IP training	Yes	161	56.7
	No	123	43.3
Numbers that IP training	Once	181	63.7
	> 1 time	101	35.6
Availability of guidelines	Yes	171	60.2
	No	113	39.8
Usage of IP guidelines	Yes	233	82
	No	44	15.5

*__Others:__ Medical, dental, outpatient department and miner, and paediatric wards.

5.1.2. Knowledge of Nurses Regarding Prevention of Surgical Site Infections

A minimum score of 4 and a maximum score of 24 out of 25 were achieved by the research participants. responding correctly to knowledge-related questions, and the median knowledge score was 14.00 (52.5%) with a standard deviation of 4.16. In this study, 143 respondents, or 50.4%, had good knowledge of surgical site infections and how to prevent them (Figure 3).

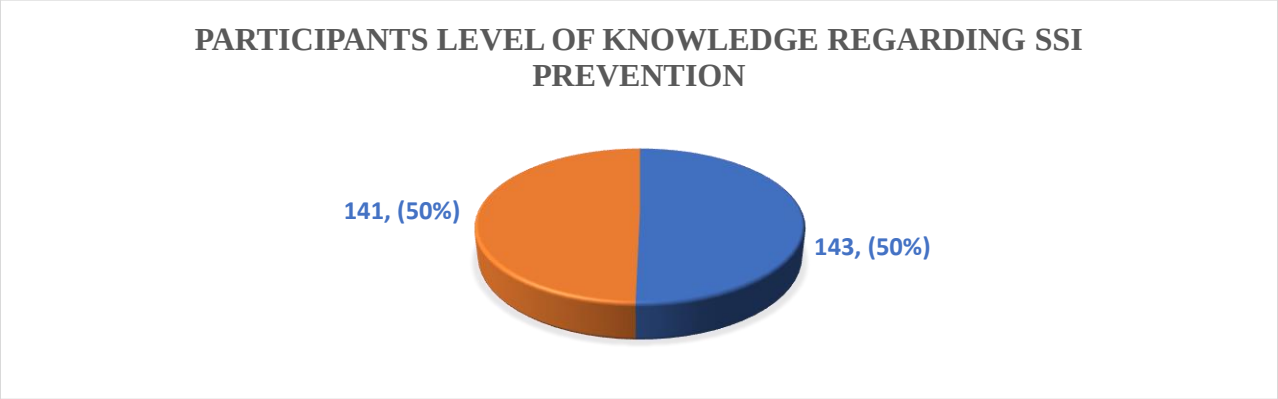

Figure 3: Nurses' knowledge about SSI prevention, in the Armed Force Compressive Specialized hospital in Ethiopia's capital, Addis Ababa, 2023 (n = 284).

In terms of the items, only 64 (22.5%) of participants provided accurate responses "best methods for pre-operative shaving," and only 77 (27.1%) correctly responded "for the diagnosis of surgical site infection." In terms of the items, only 80 participants (28.2%) appropriately responded to the inquiry relating "the type of diets to be given to postoperative patients," and only 105 participants (37.0%) correctly answered the question regarding the usefulness of wound dressing.

5.1.3. Practices for Preventing Surgical Site Infections with Nurses

Out of 25 Likert items used to assess the level of practice of nurses for the SSIs prevention, mean score practice of the research participants was found to be 81.00 (95% CI 80.70 - 83.09) with an SD of 10.20, with score of minimums of 42 and score of a maximum 100. In this study, it was found that 57.4% [95% CI. (.5161-.6318)] of the participants, or slightly above half, had good practices for preventing surgical site infections (Figure 4).

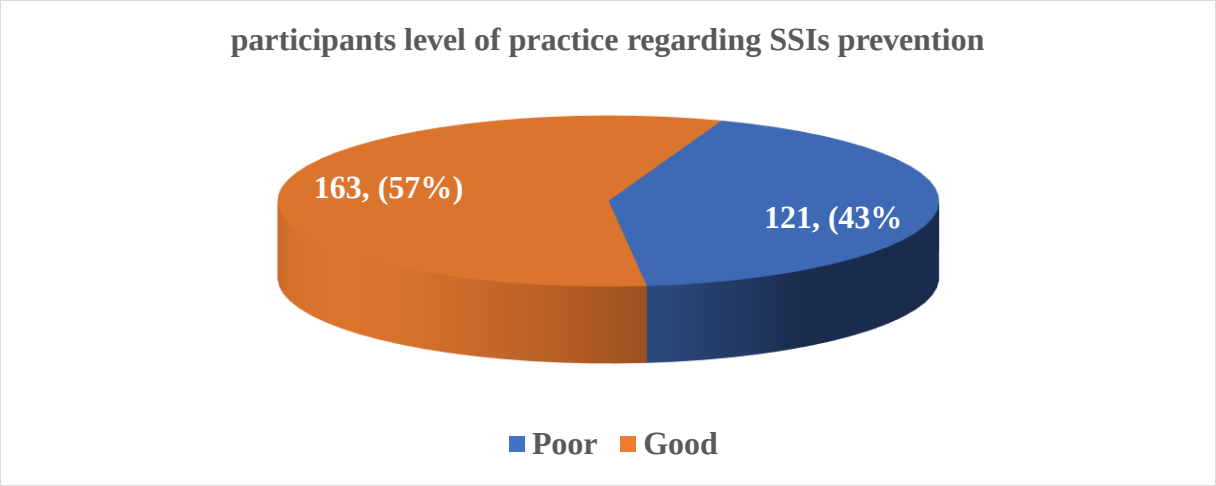

Figure 4:shows the degree of nursing practice at the AFCSH in Ethiopia's Addis Ababa city in 2023 (n = 284).

Table 2: Nurse responses to each practice section item on the AFCSH in Ethiopia's capital city Addis Ababa, 2023 (n = 284).

	Frequency and percentage			
SSI prevention practice items	**Never**	**Seldom**	**Sometimes**	**Always**
Use alcohol and chlorhexidine gluconate	12(4.2%)	28(9.9%)	139(48.9%)	105(39%)
Before and after changing wound dressings, wash your hands.	7(2.5%)	16(5.6%)	58(20.4&)	203(71.5%)
Before putting on surgical gloves, wash your hands.	21(7.4%)	21(7.4%)	128(45.1%)	114(40.1%)
Perform preoperative shaving on the day before surgery.	26(9.2%)	41(14.4%)	118(4.5%)	99(34.9%)
Learn shaving methods from others	24(8.5%)	29(10.2%)	112(39.4%)	119(41.9%)
before surgery within 120 minutes Administer preoperative antibiotics for prophylactic	62(21.8%)	46(16.2%)	118(41.5%)	58(20.4%)
Encourage patients to take a pre-operative bath 6 to 12 hours before to surgery.	32(11.3%)	32(11.3%)	141(49.6%)	79(27.8 %)
Encourage patients to take an antimicrobial-agent shower prior to surgery.	43(15.1%)	43(15.1%)	114(40.1%)	84(29.6%)
Perform prescribed glucose test before and after surgery for DM patient.	12(4.2%)	23(8.1%)	81(28.5%)	168(59.2%)
Assess patients BMI before and after surgery.	36(12.7 %)	45(15.8%)	123(43.3%)	80(28.2%)
Administer injection insulin/oral medication as ordered in dm pt.	15(5.3%)	15(5.3%)	82(28.9%)	172(60.6%)
Advice obese pt to minimize the amount of carbohydrate they take.	11(3.9%)	43(15.1%)	129(45.4%)	101(35.6%)
Advice malnourished pt to take balanced diet.	13(4.6%)	17(6%)	122(43%)	132(46.5%)
Inform immunocompromised patients to stay away from infected persons	20(7%)	26(9.2%)	114(40.1%)	124(43.7%)
Encourage a malnourished pt to take Fruits and vegetables before & after surgery.	18(6.3%)	27(9.5%)	128(45.1%)	111(39.1%)

To clean a surgical wound, use sterile forceps and other sterile dressing supplies.	8(2.8%)	13(4.6%)	61(21.5%)	202(71.1%)
Encourage immunodeficiency disorder patients to practice good personal hygiene.	7(2.5%)	21(7.4%)	104(36.6%)	152(53.5%)
To obtain a swab culture Follow an aseptic technique.	11(3.9%)	18(6.3%)	115(40.5%)	140(49.3%)
Follow aseptic technique during dressing	5(1.8%)	11(3.9%)	95(33.5%)	173(60.9%)
for cleansing surgical wound dressing Use povidone-iodine and normal saline.	3(1.1%)	12(4.2%)	115(40.5%)	154(54.2%)
Evaluate and monitor surgery site conditions.	3(1.1%)	14(4.9%)	114(40.1%)	159(53.9%)
Keep contaminated and non-infected dressings apart.	4(1.4%)	13(4.6%)	101(35.6%)	166(58.5%)
When caring for surgical wounds, wear a face mask.	5(1.8%)	35(12.3%)	75(26.4%)	169(59.5%)
Use antiseptic cleaners and disinfectants to clean and sanitize the dressing trolley's surface.	0(0 %)	21(7.4%)	109(38.4%)	154(54.2%)

5.1.4. Factors Related to Nurses' Practice in SSI Prevention.

The age (P= 0.004), marital status (P= 0.165), total nursing work experience (P= 0.035), use of IP guidelines (P= 0.007), and knowledge level of participants (P= 0.053) were shown to be significantly associated to nurses' practices dealing with infections at the surgical site and measures for prevention in the bivariate analysis of regression on cut-point P- value < 0.025. However, just the age of participating nurses (P= 0.022) and participants' use of IP guidelines (P= 0.013) were significantly associated to how nurses practiced preventing surgical site infections, according to a multivariate analysis on the cut-point P-value < 0.05. Compared to nurses under 29, those who are 29 years old or older were almost twice as likely to practice surgical site infection control. [AOR = 2.165, 95% CI (1.120–4.186)]. When compared to people who employed IP recommendations, those who didn't were 57.9% (1-0.421 = 0.579) less likely to implement surgical site infection prevention.

Table 3: Logistic regression (bivariate &multivariate) analysis of factors associated with the practice of nurses regarding prevention of SSI, in the AFCSH, in Addis Ababa, Ethiopia, 2023 (n = 284).

Variables	Categories	Practice of nurse		COR (95%CI)	P-value	AOR (95%CI)	P-value
		Good (%)	Poor (%)				
Age	≤31 years	87(50.6%)	85(49.4%)		.004	1	**.022***
	>31 years	76(67.9%)	36(32.1%)	2.063(1.255-3.389)		**2.165(1.120-4.186) ***	
Marital status	Single	78(53.4%)	68(46.6%)		.165	1	.572
	Married	85(61.6%)	53(38.4%)	1.398(.872-2.243)		.841(.460-1.536)	
Total work Experience	> 5 years	96(52.7%)	86(47.3%)		.035	1	.826
	≤ 5 years	67(65.7%)	35(34.3%)	1.715(1.038-2.832)		1.073(.573-2.013)	
Usage of IP guidelines	Yes	142(59.9%)	95(40.1%)		.007	1	**.013***
	No	17(38.6%)	27(61.4%)	.403(.208-.782)		**.421(.212-.835) ***	
Knowledge	Good	74(51.7%)	69(48.3%)		.053	1	.194
	Poor	89(63.1%)	52(36.9%)	1.596(.994-2.564)		1.388(.846-2.277)	

1= Indicate for reference group * Significant association at p-value < 0.05

When asked to grade their level of practice, nurses gave it an unsatisfactory rating of 55 (19.4%). Then, when asked to list any potential variables influencing their degree of practice, they

responded as follows: I am not knowledgeable enough about SSIs 56 (19.7%), lack of performance monitoring systems 92 (32.4%), insufficient resources to implement surgical safety checklists 80 (28.2%), and a lack of surgical site infection evaluation and preventative measure feedback systems 47 (16.5%). Other variables impacting their level of practice were reasons 4 (1.4%), such as an excessive workload, inadequate personnel, a lack of training to raise that level, and little opportunity to gain and advance knowledge and skills through formal education (Table 4).

Table 4: In the AFCSH in Ethiopia's capital city Addis Ababa, in 2023 (n = 284), nurses rated their degree of current practice and the associated factors for SSI prevention.

Variable	Responses	Frequency	Percentage
How do you rate the overall level of your current practice regarding prevention of SSI?	Very unsatisfactory	22	7.7%
	Unsatisfactory	55	19.4%
	Satisfactory	168	59.2%
	Very satisfactory	39	13.7%
If you are not very satisfied with Given your current level of competence, what causes/factors contribute to that?	I am not sufficiently knowledgeable about SSIs.	56	19.7%
	limited resources for implementing surgical safety checklists into practice	80	28.2%
	Insufficient performance monitoring systems	92	32.4%
	absence of infection at the surgical site assessment and input mechanisms for preventative measures	47	16.5%
	Others	4	1.4%

* **Others**: as an excessive amount of workload, inadequate personnel, a lack of training to improve the quality of practice, and little opportunity to acquire skills and knowledge through formal schooling.

5.2 Discussions

This study was conducted to assess the practice aspect of nurses' surgical site infection prevention as well as associated factors for the good outcome of it, especially at the army hospital in Addis Ababa, Ethiopia. It was evident that 57.4% of nurses have good in order to avoid surgery site infections. This implies that slightly under 50% of the nurses weren't practicing good SSI prevention.

The results of the study showed that one sociodemographic factor that was significantly connected with the practice of methods for preventing the spread of SSIs was the age of the research subjects. This study found that nurses who are 29 years of age and older are nearly twice as likely to properly implement surgical site infection control strategies as nurses who are younger. The phrase "practice makes perfect," which suggests that individuals could have refined their practice over time, can be utilized to explain the favorable relationship across years of service and the adoption of infection prevention behaviors.

Additionally, the results of this study demonstrated that one of the variables that was substantially connected with the practice of actions for the prevention of surgical site infection was the usage of suggested infection prevention guidelines by the study participants. Compared to those who didn't, individuals who regularly followed the available infection prevention guidelines had around 59.9% more effective practices for preventing surgery site infections. One explanation for this is that nurses are more inclined to acquire practical Knowledge regarding SSI prevention when they study infection prevention guidelines. The value of evidence-based practice or adherence to WHO recommendations for the prevention of surgical site infection is therefore demonstrated by this positive connection.

The results of this study were comparable and have similarities to those of studies carried out in Pakistan and Mekelle City, where it was found that 58% and 58.2% of staff nurses had good practice in the prevention of surgical site infections, respectively (40, 41). This result, however, slightly differed from that of studies carried out in Bangladesh (44.5%)(33), Tanzania (42.3%) (24), Amhara regional state (48.7%) (22), Bahir-Dar hospitals (45.1%) (42) and AAU (48.9%) (38). The possible variation might be explained by different sample sizes, training curricula, facilities or settings, and the availability of training, which included different types of hospitals.

The overall practice of staff nurses in avoiding and managing surgical site infection was satisfactory, in contrast to studies in Pakistan and another in Bangladesh (89.9%) (19, 20). This discrepancy may be explained by differences in sampling techniques (convince) and sample sizes (131 in Pakistan and 120 in Bangladesh), as well as hypothesis on the attitude, education, and workload of nurses with regard to the prevention of SSI. Since nurses said that a lack of resources to carry out SSI preventative actions is one of the major factors impacting their practice towards SSI prevention, it may also be connected to differences in the country's advancement levels and the corresponding resource limitations.

This study also made an effort to assess nurses' levels of knowledge. So, in terms of knowledge, with a median score of 14.00 (56%), just 143 nurses (50.4%) were found to have good knowledge of infections at the surgical site and their prevention. This shows that just around half of the nurses are knowledgeable of SSI and its prevention methods. This result is consistent with findings from previous studies; a research carried out in Pakistan indicated that the staff nurses' knowledge regarding preventing surgical site infections was poor (43), While most, if not all, of nurses in Bangladesh (70%) have not enough knowledge on SSI prevention (20). Additionally, it was shown that Jordanian nurses understand insufficient about evidence-based recommendations for SSI prevention (21). Furthermore, it is comparable with research carried out in Addis Ababa, Ethiopia, which found that only 195 participants (or 47.7%) had good knowledge about SSI prevention. (22, 38).

According to this research, nurses' knowledge of surgical site infection was inadequate due to a variety of factors, including nurses' the absence of training on preventative measures for SSI strategies and institutions' refusal to provide free access to the most updated SSI prevention recommendations for staff nurses. But it's different from a Nigerian research where nurses showed an acceptable level of knowledge in SSI prevention (23). This disparity may be due to disparities in training and implementation of SSI prevention recommendations. It can be caused by the various evaluation instruments employed in both research studies and the convenience sampling approach used in their investigation.

When asked to rate their current state of practice, 55 nurses (19.4%) gave it an unsatisfactory rating, which is a sizable portion. The next step was to ask them to list the main factors affecting their level of practice. And the findings showed that there was a lack of knowledge about

surgical site infections (SSIs), a lack of resources needed for implementing surgical safety guidelines, a lack of effectiveness tracking systems, a lack of infections at the surgical site evaluation and prevention feedback systems, as well as other factors like an excessive workload, insufficient staff, a lack of training to improve their degree of practice, a lack of orientation programs during unit rotation, and an inappropriate and harassing work environment. These problems might make nurses feel frustrated, which would lower their professional standards and provide the healthcare system with subpar treatment. The results are in consistent with a Bangladesh research that found that main variables influencing nurses' degree of practice in SSI prevention measures include a lack of information, inadequate resources and finances, inadequate monitoring of performance systems, and an absence of surveillance mechanisms (33).

This study's findings imply that nurses' SSI prevention practice is influenced by a variety of factors, including their age and use of IP guidelines. Therefore, it should be planned to provide nurses with ongoing on-the-job training to refresh their knowledge of SSI prevention. Therefore, it is crucial for surgical site IP efforts to update the nurse's skills and practice for SSI prevention based on the published global and national recommendations, such as the WHO guideline. The current evidence-based SSI preventive practice recommendations should be highlighted, and there should be more resources available to manage surgical site infection prevention, according to hospital managers, who should deliver on-the-job ongoing educational training to raise awareness of IP. In order to verify nurses' self-reported habits and ascertain real practices, future researchers should take stronger observational study designs into consideration.

5.2.1. Limitations of the study

1. The following limitations were inherent in this study because it employed a self-administered Likert scale to assess the nurse's practice towards surgical site infection prevention: Participants avoid utilizing extreme response categories (central tendency bias) and agree with statements as presented (acquiescence bias). As the data was collected by health professionals, there may be a social desirability bias. The domains of

a nurse's practice were self-reported and may be limited by recall bias. As a result, the outcome may not accurately reflect current nursing practice in the prevention of SSIs.

2. Because the study was cross-sectional, no cause-and-effect linkages could be established.
3. Another drawback was that, due to time and financial constraints, this study was limited to the Armed Forces Comprehensive Specialized Hospital in Addis Ababa. It would have been possible to compare variations in nurse practice &knowledge about SSI prevention between Army commands and division hospitals out of Addis Ababa.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1. Conclusions

The aim of this research was to answer the question, "How is surgical site infection prevention practiced and what are the factors associated with it among nurses working in the Armed Forces comprehensive specialized hospital?". cross-sectional research conducted at an institution and structured self-administered questionnaires were used to assess SSI prevention practice and related variables among nurses employed in the AFCSH.

Our findings demonstrated that nurses' practices for preventing surgical site infection were significantly influenced by the participants' ages and the usage of current infection prevention recommendations. The study also attempted to delve deeply into the elements influencing nurses' practice. Nurses need to be trained, have easy access to and use of surgical site infection prevention guidelines, and have robust knowledge to transform their knowledge into desirable actions.

6.2. Recommendations

As a result, emphasis should be placed on upgrading nurses' practice, making training programs equitable in practical time rather than theoretical, making resources available such as WHO-recommended guidelines, training on the importance of usage accordingly, and forming an infection prevention committee. Furthermore, hospital managers should emphasize the importance of including nurses in strategy development so that nurses might be inspired and perform their tasks well.

The Federal Ministry of Défense health directorate is strongly advised to develop and work in accordance with infections at the surgical site prevention recommendations according to evidence-based internationally accepted standards and the Ministry of Health's latest recommendations, as well as designing on-service and off-service training programs for nursing staff in hospitals regarding SSI prevention in collaboration with other stakeholders.

For nurses, there are many new guidelines for preventing surgical SSIs that differ from more ancient ones, and it's essential to read to stay informed, training, and so on. Therefore, it is essential to evaluate the most recent guidelines for SSI prevention. Making sure that knowledge

learned independently is put to good use is also crucial. Working from self-awareness improves patients Moreover, the nurse's professional success and enjoyment.

Researchers are highly encouraged to do future research using a combined study design and to thoroughly address the unsolved difficulties in this study, notably the nurse's attitude toward the prevention of surgical site infection.

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8. ANNEXES

A. Annex I: Information sheet and consent form

Addis Ababa University College of Health Sciences, School of Nursing and Midwifery

Consent form to certify the participants agreement on the questionnaire!

Introduction

This is a self-administered questionnaire prepared to collect data on the surgical site infection prevention practice, and associated factors among nurses working in the Armed force comprehensive specialized hospital in Addis Ababa, Ethiopia, 2023.

Today I am here to collect data on the practice and associated factors regarding surgical site infection prevention. The objective of this study is to assess the practice and associated factors regarding surgical site infection prevention among nurses working in the Armed force comprehensive specialized hospital in Addis Ababa, Ethiopia. Your correct and genuine answer to the questions can make the study achieve its goals. Based on such result and commitments from the researcher the findings will be disseminated to different stakeholders and the problem will be solved accordingly. I kindly request you to answer the questions honestly and anonymously. Since this self-administered questionnaire is based on willingness you have the right not to participate, to participate partially and wholly. I would like to promise you that it will not have any risk on you and confidentiality of the information you rendered will be kept. For that reason, you don't need of writing your name. It will take approximatly1hour to complete the questionnaire.

Are you willing to participate in the study?

Yes ☐ No ☐

Thank you for your cooperation!!!

B. Annex II: Structured English Version Questionnaire

Section One: Questions on Socio Demographic Characteristics of Participants and Related Institutional Issues.

Please read and encircle the number that belongs to you and write your answer on the blank spaces for the questions asking you to write your answer.

S. No	Questions	Responses
101	Age	_____Years
102	Sex	1. Male 2.Female
103	Rank	1.Pvt 2. Corporal 3. Surgent 4. Middle officer 5. Higher officer 6. Civil
104	Marital status	1. Single 2.Married
105	Educational status	1. Diploma 2. Degree 3. Masters
106	Total monthly income	_____Ethiopian birr
107	Total work experience	1. 0-5years 2.6-10years 3. 11-15years 4. 16-20years 5. Above 20years
108	Work experience in the surgical units	_____Years
109	Name of duty ward	1. Surgical 2. Orthopaedics 3. Recovery 4. Gyn. and labour 5. Others (specify)_____
110	Have you ever taken training regarding infection control? If no, go to question number **112**.	1. Yes 2. No
111	If yes for the above question, mention the number of infections control trainings you attend.	_____Times
112	Is there a surgical site infection prevention guideline in your hospital? If no, go to section two.	1.Yes 2. No
113	If yes for question number 112; Are you using it?	1.Yes 2. No

Section Two: Questions that are used to assess nurses' knowledge about surgical site infection prevention.

Multiple Choice Questions: Read the questions and encircle the best answer based on your understanding

S. No	Questions	Responses
201	What is the best method for preoperative shaving if indicated?	1. Razor shaving method 2. Applying shaving cream method 3. Clipping shaving method
202	When is the best time for preoperative hair removal?	1. On night preoperatively outside the OR 2. On the day of surgery inside the OR 3. On the day of surgery outside the OR
203	When should you administer antibiotic prophylaxis?	1. Within 120 minutes before operation 2. Within 60 minutes before operation 3. Within 30 minutes before operation
204	Which one is correct answer for prophylaxis antibiotics?	1. Prophylaxis antibiotic is important to prevent surgical site infection 2. Prophylaxis antibiotic is less important to prevent surgical site infection 3. Prophylaxis antibiotic is not important to prevent surgical site infection
205	What is the primary purpose of preoperative showering?	1. To reduce the skins microbial load 2. To make the patient feel comfortable 3. To prevent spread of infection from the patient to the health workers
206	What is the best agent for preoperative showering to prevent surgical site infection?	1. Tap water 2. Anti-bacterial soap 3. Herbal soap
207	What is the purpose of preoperative skin preparation?	1. To prevent or inhibit bacterial growth 2. To prevent or inhibit viral growth only 3. To prevent or inhibit fungal growth only
208	Which one is the best agent for pre-operative skin preparation?	1. Alcohol based products basedon with chlorhexidine 2. Savalon solution products 3. Hydrogen peroxide solution products

209	How would you disinfect surgical site before surgery?	1. Applying broad spectrum antiseptics 2. Applying soap solution 3. Applying Savlon solution
210	What is the best antiseptic solution to disinfect the surface of dressing trolley?	1. Savalon solution 2. 0.5 % chlorhexidine solution 3. 70%Ethylalcohol with 0.5 chlorhexidine
211	Which one is the correct purpose of surgical hand washing?	1. Reduce the risk of dryness of the hand 2. Increase the risk of surgical site infection 3. Reduce the risk of surgical site infection
212	Which one is the correct step of hand washing?	1. Wet your hands, rinse, apply antiseptic agent and dry 2. Wet your hands, apply antiseptic agent, rinse and dry 3. Wet your hands, apply antiseptic agent, dry and rinse
213	What kinds of diet should be provided for the postoperative patients?	1. Protein rich diet and vitamin C containing foods 2. Carbohydrate rich diet& vitamin C containing foods 3. Fat rich diet & vitamin C containing foods
214	What is the purpose of maintenance of normal nutritional status for surgical patients?	1. Preventing post-operative complication 2. Reduce immune function 3. Reduce healing process
215	Which one is correct answer for surgical patients with compromised immune system?	1. More vulnerable to surgical site infection 2. Have normal immune function 3. Less vulnerable to surgical site infection
216	How do you prevent infection of patients with immunodeficiency	1. Eat fresh fruits and fresh vegetables 2. Eat well-cooked food

	disorder?	3. Drink tap water
217	What are laboratories in assessing patient's nutritional status?	1. Serum albumin and complete blood count 2. Serum albumin and urine analysis 3. Serum albumin and stool examination
218	What is correct level of blood sugar which enhances function of white blood cell adequate to prevent surgical site infection?	1. Lower than or equal to 110 mg/dl 2. Lower than or equal to 200 mg/dl 3. Higher than 200 mg/dl
219	Which one is correct for the malnourished surgical patients?	1. Have more immune response to prevent infection 2. Have less immune response to prevent infection 3. Have normal immune response to prevent infection
220	When do you change the surgical wound dressing?	1. Within 24 hours after surgery 2. When a dressing material present with alot of exudates 3. When a surgeon order
221	How do you select dressing solutions for surgical wound?	1. Based on wound characteristics 2. Based on size of the wound 3. Based on the depth of the wound
222	Which one is the correct answer for the benefit of wound dressing?	1. Dressing decreases wound pain 2. Dressing absorbs exudates 3. Dressing doesn't absorb exudates
223	Which statement is correct for diagnosis of surgical site infection?	1. Surgical site infection occurs within 30 days after operation 2. Incision culture is negative 3. Patient has fever within the first 3 days after operation
224	Which answer is a good sign of no surgical site infection?	1. No discharge, no fever 2. No discharge, oedema of the skin around the wound 3. No discharge, open suture line

225	Which laboratory is used to ensure surgical site infection?	1. Swab culture investigation 2. Blood culture investigation 3. Urine culture investigation

Section Three: questions that are used to assess nurses' level of practice regarding prevention of surgical site infection and related institutional issues.

Please answer the following questions by giving the mark (X) on the column that best fit to your current level of practice honestly.

S. No	Questions	Never	Seldom	Some times	Always
301	How often do you use alcohol and chlorhexidine gluconate as an antimicrobial in your ward?				
302	How often do you wash your hands before and after changing wound dressings and touching surgical sites?				
303	How often do you wash your hands before wearing surgical gloves?				
304	How often do you perform preoperative shaving on the day before surgery?				
305	How often do you administer preoperative prophylactic antibiotics within 120 minutes before surgery?				
306	How often do you learn shaving methods from others?				
307	How often do you advise patients to take pre-operative showering within 6-12 hours before surgery?				
308	How often do you advise patients to take pre-operative showering with antimicrobial agent?				
309	How often do you perform prescribed glucose test before and after surgery in a diabetic patient?				
310	How often do you assess the patient's body mass index (BMI) before and after surgery?				

311	How often do you administer injection insulin or give oral medication as ordered in diabetic patient?				
312	How often do you advise obese patients to reduce the amount of carbohydrate they take?				
313	How often do you advise a malnourished patient to take nutritious diet (especially protein diet)?				
314	How often do you advise a patient with a compromised immune system to avoid contact with people who have infections?				
315	How often do you advise a malnourished patient to take vegetables and fruits before & after surgery?				
316	How often do you use sterile forceps and sterilized dressing materials for cleaning surgical wound dressing?				
317	How often do your advice patients with immunodeficiency disorder to maintain their personal hygiene?				
318	How often do you follow an aseptic technique during obtaining swab culture?				
319	How often do you follow an aseptic technique during surgical wound dressing?				
320	How often do you use povidone-iodine and normal saline for cleansing surgical wound dressing?				
321	How often do you asses and monitor surgical site conditions?				
322	How often do you separate infected dressing from non- infected dressing?				
323	How often do you wear face mask during cleaning surgical wound and change dressings?				

324	How often do you perform cleaning and disinfect surface of the dressing trolley with anti-septic solutions?				
325	How often do you discard the soiled materials in the proper place after performing wound dressing?				
326	How do you rate the overall level of your current practice regarding prevention of surgical site infection? Encircle your choice. 1. Very unsatisfactory 2. Unsatisfactory 3. Satisfactory 4. Very satisfactory				
327	If you are not very satisfied with your practice, what are the reasons? **Note**: More than one answer is possible. Encircle your choice. 1. I have no sufficient knowledge about surgical site infection prevention 2. Inadequate resources to implement surgical safety checklists in the hospital 3. Insufficient performance monitoring systems related to surgical site infection prevention 4. Lack of surgical site infection assessment and preventive measure feedback systems 5. Others: _____				

THANK YOU!!! FOR SPARING YOUR TIME TO ANSWER THIS QUESTIONNAIRE.

assessment of surgical site infection prevention practice, and associated factors among nurses in the armed forces comprehensive specialized hospital in Addis Ababa, Ethiopia, in 2023.

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