

## Knowledge And Efficiency of Surgical Suite Disinfection Techniques Teaching Among Nurses Working At Dessie Regional & Referral Hospital, Eastern Amhara, Ethiopia

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**Introduction:** Surgical Suite Disinfection techniques are a set of method to prevent the spread of hospital acquired infection. To protect patients from pathogens during medical and surgical procedures, health care forces use Surgical Suite Disinfection techniques.

**Objectives:** To assess knowledge and the efficiency of Surgical Suite Disinfection Techniques teaching program among nurses in Dessie Regional & Referral Hospital, Eastern Amhara, Ethiopia.

**Methodology:** Institution based pre-experimental one group pre and post test design was used and 51 study subjects were selected by convenient sampling technique. The study samples included nurses working at surgical suite. Data collection took place between Octobers to November 2016. The collected data were analyzed using descriptive and inferential statistics and statistical significances for variables were set at p- value less than 0.05.

**Results:** There was a significant enhancement in the knowledge score related Surgical Suite Disinfection techniques before and after the educational program. There were significant median differences in knowledge score ( $p = 0.04$ ) after the teaching program on Surgical Suite Disinfection techniques in this study subjects. Sixty-seven (67) % of respondents rated the training program as very good. Seventeen (17) % of respondents had rated as good and 4% rated as fair and very few of the respondents rated as poor.

**Conclusion & Recommendation:** The teaching program provided by Wollo University staff was found to be an effective, plausible in knowledge on Surgical Suite Disinfection Techniques. The study recommended conducting further study in other hospitals in around the different regions of Ethiopia and Periodic updated guidance shall be provided to nurses who work at Surgical Suite to update their knowledge regarding Surgical Suite Disinfection techniques.

**Keywords:** Efficiency, Surgical Suite, Disinfection, Techniques.

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### I. Introduction

Health-care-associated infection (HAI) is a major global safety concern for both patients and health-care professionals. HAI is defined as an infection occurring in a patient during the process of care in a hospital or other health-care facility that was not manifest or incubating at the time of admission. This includes infections acquired in the hospital and any other setting where patients receive health care and may appear even after discharge and it accounts for a major risk factor for serious health issues leading to death [1-3]. Infections that are acquired by hospital staff, visitors or other healthcare personnel may also be considered as health-care-associated infection [4]. Infections acquired in health care settings are among the major causes of death and increased morbidity among hospitalized patients. Improper hand hygiene is one of the most important contributing factors to health care-acquired infections [5].

Globally, over 1.4 million people worldwide suffer from infectious complications acquired in hospital [6]. About 75% of the burden of these infections is present in developing countries [7]. Asymptomatic patients may be considered infected if these pathogens are found in the body fluids or at a sterile body site, such as blood or cerebrospinal fluid [8]. The burden of HAI is already substantial in developed countries, where it affects from 5% to 15% of hospitalized patients in regular wards and as many as 50% or more of patients in intensive care units (ICUs) [9,11]. Studies conducted in different parts of the world show that in North America and Europe

5%–10% of all hospitalizations result in nosocomial infections, while Latin America, Sub-Saharan Africa and Asia show more than 40% hospitalizations with nosocomial infections [12].

Overall HAI cumulative incidence in surgical wards ranged from 5.7% to 45.8% in studies conducted in Ethiopia and Nigeria. The latter reported an incidence as high as 45.8% and an incidence density equal to 26.8 infections per 1000 patient-days in paediatric surgical patients. In a study conducted in the surgical wards of two Ethiopian hospitals, the overall cumulative incidence of patients affected by HAI was 6.2% and 5.7% [14,15]. Health care associated infections are among the most aggravating agents of mortality, morbidity, length of hospital stay and cost in the world. Preventive measures must be provided to all staffs with potential exposure to body fluids and these can be achieved by proper screening & handling of patients, proper disposal of sharps and wastes, wearing protective cloths, gloves, gowns, aprons, goggles, managing inoculation accidents, adequate water supply, disinfection and sterilization. Overcrowding, inadequate infection control practices, lack of infection control policies, guidelines and trained professionals also adds to the extent of the problem. Hospital-acquired infection is a major safety issue affecting the quality of care of hundreds of millions of patients every year, in both developed and developing countries, including Ethiopia. Thus, this study attempts to evaluate the effectiveness of “Surgical Suite Disinfection Techniques” training program among nurses in Dessie Regional & Referral Hospital.

## **II. Objectives**

- 2.1** To assess the knowledge of nurses before and after the training on Surgical Suite Disinfection techniques in Dessie Regional & Referral Hospital, Eastern Amhara, Ethiopia
- 2.2** To evaluate the efficiency of Surgical Suite Disinfection techniques teaching on knowledge of nurses in Dessie Regional & Referral Hospital, Eastern Amhara, Ethiopia

## **III. Methodology**

- 3.1. Research design:** A pre-experimental one group pre and post test design was used in this study subjects.
- 3.2. Setting and sampling:** The study was conducted in Dessie Regional and Referral Hospital which is located in Eastern Amhara Region, Ethiopia. The study samples included BSc and Diploma nurses working at theatre. Data collection took place between October - November 2016. Convenient sampling technique was used to select operation room nurses 32 BSc and 19 Diploma nurses.
- 3.3. Description of the tool:** The tool is divided into mainly 3 parts  
**Part-A:** Socio-demographic variables.  
**Part-B:** Knowledge related questions (11 items) to assess both pre- & post-test phases of the trainees regarding Surgical Suite Disinfection techniques. A score of one was allotted for correct knowledge related questions and zero was given for incorrect responses respectively by the study participants.  
**Part-C:** Performa (7 items) to assess the effectiveness of the training using five point Likert scale ranging from 5 (Excellent) to 1(Poor) and Likert scales were dichotomized as follows: Excellent, very good and good were considered as “Good”, whereas fair and poor considered as” Poor”.
- 3.4. Content validity:** The tool was developed by investigators after reviewing related literatures to evaluate the effectiveness of the training program on Surgical Suite Disinfection techniques.
- 3.5. Pilot study:** The instrument was piloted on 4 BSc and 1 diploma nurse in order to test the clarity and feasibility of the tool at Kemissie Hospital. After the pilot study, the tool was modified by the investigators as per the requirement. The pre-test assessment was conducted on day one and on the same day of the interactive lecture and discussion was introduced for three consecutive days for the main study participants.
- 3.6. Data collection procedure:** Prior permission was obtained from the concerned authority. Informed consent obtained from the study subjects. All nurses who participated in the study were those who actually agreed to complete the study and they were approached with a full description of the study and its aim, after which the study subjects were allowed to be free to participate in the study. Confidentiality of the nurses was protected through-out the study. A Post test was administered after recommended period to check the skill set of participants regarding Surgical Suite Disinfection techniques.
- 3.7. Statistical analysis:** Once all necessary data obtained, data was checked for completeness edited, cleaned, coded and entered in to and analyzed by SPSS version 20 for windows The collected data were analyzed by using descriptive (frequency, percentage and median) and inferential (Wilcoxon’s signed test) statistics. Statistical significances for variables were set at p- value less than 0.05.

## **IV. Results**

The majority (72.5%) of respondents were females. The median age of the respondents was  $28.98 \pm 7.8$ SD year. The majority (68.6 %) of nurses were younger and below the age of 30 years old. The median year of experience for the sample was  $2.0 \pm 6.2$ SD. The highest percentages (62.7%) were with bachelor degree (Bsc

nursing). 62.7 % of participants were single. The greater part (62.7%) of respondents had less than five years of work experience. Almost all (98%) of samples had no recent training on Surgical Suite Disinfection techniques. (Table I)

**Table I.** Socio-demographic characteristics of the study participants (n =51)

Personal Characteristics		Frequency(n)	Percentage (%)
Sex	M	14	27.5
	F	37	72.5
Age(years)	< 30	35	68.6
	30+	16	31.4
Marital status	Single	32	62.7
	Married	19	37.3
Qualification	BSc Nurse	33	64.7
	Diploma Nurse	18	35.3
Work experience(yrs)	< 5 years	30	58.8
	5+ years	21	41.2
Recent training in Surgical Suite Disinfection techniques		1	2
	Yes	50	98
	No		

Regarding nurses’ knowledge related to Surgical Suite Disinfection techniques: pre- and post-educational program. The knowledge pertaining to all factors (10 factors) were improved after the training program except for one i.e. for chemical disinfectant acts as a protein denaturant (p = 0.23) however, the time duration of operation theatre after fumigation (p = 0.01), knowing two main types of gloving (p = 0.001), knowing the inner part of the surgical gown (p = 0.001), and position of the hand after wearing sterile gown (p = 0.001) showed significant median differences with improvement of participants knowledge on Surgical Suite Disinfection techniques. There was a significant median difference in knowledge score after the training on Surgical Suite Disinfection techniques in this study subjects (p = 0.04) (Table II)

**Table II.** Nurses’ overall knowledge score related to Surgical Suite Disinfection techniques: pre and post training program (n =51)

Item	Pre-program		Post-program		% Change	P-value
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)		
<b>Knowledge</b>						
1.Purpose of Surgical Suite Disinfection	38	74.5	49	96	21.5	0.45
2.Most common methods of sterilization	46	90.2	49	96.1	5.9	0.07
3.Chemical disinfectant acts as a protein denaturant	44	86.3	37	72.5	-13.8	0.23
4.Method that kills all microorganisms	37	72.5	44	86.3	13.8	0.09
5.Time duration in OR after fumigation	7	13.7	50	98	84.3	0.01
6.Key component with hand hygiene	42	82.4	46	90.2	7.8	0.25
7.Types of gloving	18	35.3	37	72.5	37.2	0.001
8.Position of hands after scrubbing	34	66.7	37	72.5	5.8	0.44
9.Inner part of the surgical gown	5	9.8	51	100	90.2	0.001
10.Position of the hand after wearing sterile gown	10	19.6	50	98	78.4	0.001
11.The sterile field	39	76.5	42	82.4	5.9	0.47

<b>Total mean <math>\pm</math>SD</b>	4.14 $\pm$ 1.1	9.39 $\pm$ 1.4	1.965	0.04
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The overall effectiveness of the training was assessed based on the following seven evaluative questions with five Likert's scales ranging from excellent (5) to poor (1) as follows: - How would you rate the overall quality of this Teaching? , How well did the presenters state the objectives? , How well did the presenters keep the session alive and interesting? , What was your overall rating of the presenters? , How well did this program accommodate your background and needs? , How effective were the handouts? And how convenient was the location? Based on the above seven criteria the overall effectiveness of Surgical Suite Disinfection techniques teaching, 67% of respondents rated the program as very good. Seventeen (17) % of respondents have rated as good, and 4% have rated as fair and also 4% of the respondents rated as poor.

## **V. Discussion**

It is important to note that there is a need to support and guide all hospital staff in performing effective Surgical Suite Disinfection techniques to prevent health-care-associated infections. The results of the study confirmed that interventions using Surgical Suite Disinfection education training were associated with improved knowledge. Based on the results, there was a significant median difference observed between the scores of pre-test and post-test intervention program in this study subjects. This finding shows that on job training has a positive improvement in knowledge on Surgical Suite Disinfection techniques among nurses. Similarly, a study conducted in USA revealed that well-trained hospital staff plays an important role in health care performances [16, 17]. And also a study conducted in China found that dramatic improvement was observed after the training program regarding participants' knowledge on infection prevention [18].

## **VI. Conclusion**

There was a dramatic and significance improvement in participants' knowledge after the teaching program on Surgical Suite Disinfection techniques. The majority of the respondents rated the training program as very good and good. But, very small percentages of respondents were not satisfied with teaching program.

## **VII. Recommendations**

The teaching program provided by Wollo University staff was found to be effective, plausible in knowledge on Surgical Suite Disinfection techniques and which can be scaled up further to nearby Hospital staff. Based on the results of the present study it is recommended that; Periodic training program could be provided to nurses who work at operation room to update their knowledge regarding Surgical Suite Disinfection techniques. Further studies needed to be performed with different variables, subjects and different settings in a wider geographical area with larger sample size with a qualitative method and interventional mode.

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## **Contribution of authors**

YG & PK were involved in the design of the study, development of questionnaire, data analysis & interpretation of the findings, report writing and manuscript preparation. All the authors were involved in "Surgical Suite Disinfection techniques" teaching program for Bsc and diploma nurses. All authors read and approved the final manuscript.

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