



RESEARCH ARTICLE

INFECTION VS ASEPSIS: SKILL AND EFFICACY OF HANDS ON PRACTICE COACHING ON OPERATION ROOM ASEPSIS AMONG NURSES WORKING AT DESSIE REFERRAL HOSPITAL, EASTERN AMHARA, ETHIOPIA

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ABSTRACT

**Introduction:** 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. Asepsis is a set of process to prevent the spread of hospital acquired infection. To protect patients from pathogens during medical and surgical procedures, health care forces use aseptic techniques.

**Objectives:** To assess the efficacy of hands on practice coaching regarding Operation room asepsis among nurses in Dessie 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 Operation theatre. Data collection took place between October-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 difference in skill score related factors under this study before and after the hands on practice coaching. There was a significant median difference in skill ( $p = 0.02$ ) scores after the hands on practice coaching regarding operation room asepsis among study subjects. Sixty-seven (67) % of respondents rated the hands on practice coaching as very good. Seventeen (17) % of respondents had rated as good, and 4% rated as fair and also 4% of the respondents rated as poor.

**Conclusion and Recommendation:** The hands on practice coaching provided by Wollo University staff was found to be efficient, conceivable on operation room asepsis skill and which can be scaled up further to nearby Hospital staff. Periodic training program shall be provided to nurses who work at operation theatre to update their skill regarding operation room asepsis.

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INTRODUCTION

Health care associated infections (HAI) are among the most aggravating agents of mortality, morbidity, length of hospital stay and cost in the world. Health-care-associated infection 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 (Prevention of hospital-acquired infections: a practical guide, 2002; Burke,

2003; Bates *et al.*, 2009). Infections that are acquired by hospital staff, visitors or other healthcare personnel may also be considered as health-care-associated infection (Lolekha and Ratanaubol, 1981). 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 (Abdella *et al.*, 2014). Globally, over 1.4 million people worldwide suffer from infectious complications acquired in hospital (The hospital in rural and urban districts, 1992). About 75% of the burden of these infections is present in developing countries (Obiero *et al.*, 2015). 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 (WHO, 2009). The burden of HAI is already substantial in developed countries, where it affects from 5% to 15% of hospitalized patients in regular wards and

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as many as 50% or more of patients in intensive care units (ICUs) (Vincent *et al.*, 2009; Brusaferrero *et al.*, 2015). 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 (WHO 2002). 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% (Messele *et al.*, 2009; Kesah *et al.*, 2004). Preventive measures must be provided to all staff 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, eye wares, 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 efficacy of “the hands on practice coaching on operation room Asepsis among nurses in Dessie Regional & Referral Hospital.

### Specific objectives

To assess the skill of nurses before and after the hands on practice coaching on operation room Asepsis in Dessie Regional & Referral Hospital, Eastern Amhara, Ethiopia. To assess the efficacy of the hands on practice coaching on operation room Asepsis skill of nurses in Dessie Referral Hospital, Eastern Amhara, Ethiopia.

## MATERIALS AND METHODS

**Research design:** A pre-experimental one group pre and post test design was used in this study subjects.

**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 Operation theatre. Data were collected during October - November 2016. Convenient sampling technique was used to select operation room nurses 32 BSc and 19 Diploma nurses.

**Description of the tool:** The tool is divided into three parts

**Part-A:** Socio-demographic variables.

**Part-B:** Skill/practice related questions (7 items) to assess both pre & post-test phases of the trainees regarding the hands on practice coaching on Asepsis. A score of one was allotted for correct practice related questions and zero was given for incorrect responses respectively by the study participants.

**Part-C:** Performa (7 items) to assess the efficacy of the hands on practice coaching using five point Likert scale ranging from score 5- Excellent to score-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.”

**Content validity:** The tool was developed by investigators after reviewing related literatures and consulting the experts to evaluate the efficacy of the hands on practice coaching on Asepsis.

**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 Primary 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 training then interactive lecture, discussion, skill demonstration was introduced for three consecutive days for the main study participants.

**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 also nurses 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 to check the skill set of participants regarding operation room asepsis.

**Statistical analysis:** Once all necessary data obtained, data were checked for completeness edited, cleaned, coded and entered in to and analyzed by SPSS version 20 for windows. The collected data was analyzed by using descriptive (frequency, percentage and median) and inferential (Wilcoxon’s Signed Teat) statistics. Statistical significances for variables were set at p- value less than 0.05.

## RESULTS

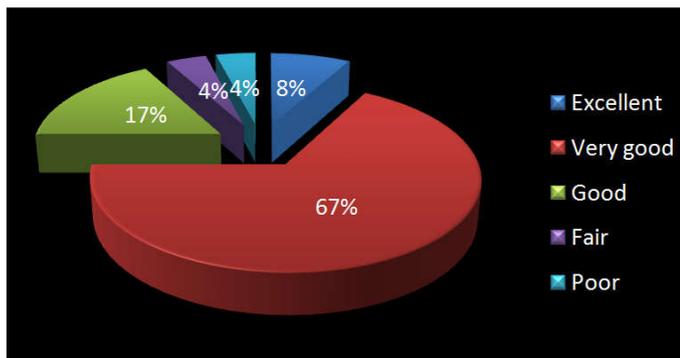
The majority (72.5%) of respondents were females. The median age of the respondents was  $28.98 \pm 7.8SD$  year. The majority (68.6 %) of nurses were younger and below the age of 30 years old. The median year of experience for the sample was  $2.0 \pm 6.2SD$ . The highest percentages (62.7%) were with 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 aseptic techniques. (Table 1) Pertaining to nurses’ skill or practice factors related to Asepsis: pre- and post-educational program, six factors out of seven factors showed significant improvement in skill ( $p = 0.02$ ). Significance post-test median differences were observed in skill in aseptic techniques ( $p = 0.001$ ), decontaminant solution preparation ( $p = 0.001$ ), proper aseptic hand scrub ( $p = 0.002$ ), and practice of closed gloving techniques ( $p = 0.02$ ) There was also a significant median difference in practice score after the training on operation room asepsis in this study subjects ( $p = 0.02$ ) (Table II). 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 instruction?, 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?.

**Table I. Socio-demographic characteristics of the study participants (n =51) in Dessie Regional & Referral & Hospital, Eastern Amhara, Ethiopia, 2016GC**

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

**Table II. Nurses' overall skill or practice score related to operation room Asepsis: pre & post on hands on practice coaching (n =51) in Dessie Referral Hospital, Eastern Amhara, Ethiopia, 2016 GC**

| Item                                     | Pre-test (Correct response) |                | Post-test (Correct response) |                | % Change | P-value |
|--|-----------------------------|----------------|------------------------------|----------------|----------|---------|
|  | Frequency (n)               | Percentage (%) | Frequency (n)                | Percentage (%) |          |         |
| Practice                                 |                             |                |                              |                |          |         |
| 1. Skill in aseptic techniques           | 20                          | 39.2           | 44                           | 86.3           | 47.1     | 0.001   |
| 2. Chemical disinfection                 | 44                          | 86.3           | 49                           | 96.1           | 9.8      | 0.09    |
| 3. Hand washing practice                 | 40                          | 78.4           | 38                           | 74.5           | -3.9     | 0.66    |
| 4. Regular masks use                     | 18                          | 35.3           | 20                           | 39.2           | 3.9      | 0.71    |
| 5. Decontaminant solution preparation    | 23                          | 45.1           | 43                           | 84.3           | 39.2     | 0.001   |
| 6. Proper aseptic hand scrub             | 24                          | 47.1           | 38                           | 74.5           | 27.4     | 0.002   |
| 7. Practice of closed gloving techniques | 13                          | 25.5           | 44                           | 86.3           | 60.8     | 0.001   |
| Total mean +SD                           | 5.82+0.97                   |                | 5.91+1.09                    |                | 1.539    | 0.02    |

**Fig. I. The effectiveness of hands on practice coaching on Asepsis as rated by study participants: post- training program (n =51) in Dessie Referral Hospital, Eastern Amhara, Ethiopia**

How effective were the handouts? And how convenient was the location?

Based on the above seven criteria the overall efficacy of hands on practice coaching on operation room Asepsis was evaluated and the result was found that, 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 (Fig. I)

## DISCUSSION

It is important to note that there is a need to support and guide all hospital staff in performing effective asepsis to prevent health-care-associated infections. The results of the study confirmed that interventions using aseptic techniques education training were associated with improved skills. Based on the results, there was a significant 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 practice on asepsis among nurses. Similarly, a study conducted in USA revealed that well-trained hospital staff plays an important role in health care performances (Oermann *et al.*, 2011). And also a study conducted in China found that dramatic improvement was observed after the training program regarding participants' practice on infection prevention (Kim *et al.*, 2007). The majority of nurses in this study had no previous training on aseptic techniques. Whereas, a study conducted in America and India revealed that many hospitals are providing formal training and updated refresher trainings at regular intervals for their staff (Wissenberg *et al.*, 2013; Gajic *et al.*, 2013). Other studies also conducted in India and Iran suggested that such trainings are very important to improve the waste handling practices of the staff in hospital environment (Kumar *et al.*, 2010). Another study conducted in France reported that health care workers must need regular information and reinforcing messages on the management of health care associated infections (Brunot *et al.*, 2012). Literature proved that the practical demonstration has positively influence the practices of an individual and their behavior at their work place (Larson *et al.*, 2009). A study conducted in Sri Lanka by Senarath *et al.* on comprehensive care for health workers showed that significant change in practice that can greatly bring quality of care for health care settings (Senareth *et al.*, 2007). Most of the respondents rated this hands on practice coaching on Asepsis as very good (67%), good (17%) and excellent (8%) towards the overall effectiveness of the training programs on aseptic techniques in the present training methods.

## Conclusion

There was a remarkable and significance improvement in participants' skill/ practice after the hands on practice coaching on Asepsis. The majority of the respondents rated the hands on

practice coaching on Asepsis as very good and good. But, very few were not satisfied with the hands on practice coaching on Asepsis.

## Recommendations

The training program provided by Wollo University staff was found to be effective, plausible in the hands on practice coaching on Asepsis and which can be scaled up further to nearby Hospital staff. Based on results of the present study it was recommended that; periodic training program shall be provided to nurses who work at operation theatre to update their skill or practices regarding Asepsis. 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 with updated intervention.

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**Contribution of authors:** All the authors were involved in the design of the study, data analysis, and interpretation of the findings, report writing questionnaire preparation and manuscript preparation. All the authors were involved in “Hands on practice coaching on operation room Asepsis” for clinical nurses. All authors read and approved the final manuscript.

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