

# Comparative Study on Compliance to Standard of Preoperative Surgical Asepsis among Scrub Nurses in Misurata, Libya

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**Abstract** This article is all about the compliance of all scrub nurses assigned in hospitals commonly with most of the surgical procedures on the standard of preoperative surgical asepsis in Misurata, Libya purposely to determine how these health care personnel are compliant with the procedure for it is a vital or critical element of controlling or preventing infection prior and after surgical or invasive procedure. A comparative descriptive design was employed. Data were gathered with the aid of a self-made checklist utilized by the authors. The results were tallied, tabulated and interpreted using the Analysis of Variance (ANOVA) or F-Test as a tool for comparison. Indeed, scrub nurses were found to be highly compliant with the standard of preoperative surgical asepsis. Though variability was noted in performing specific key area, there is no difference on level of significance found in the variable examined.

**Keywords** Compliance, Scrub nurses, Preoperative surgical asepsis, Operating theater dress, Surgical hand washing, Surgical mask, Surgical gowning and gloving

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## 1. Introduction

The specialty of operating room nursing is coming of age in both image and practice. In the past few years, operating room nurses have expanded their practice patterns and responsibilities, enhanced their self-concepts and advanced to the level of perioperative nursing. Operating room nurses are responsible for providing a safe, efficient, and caring operating room environment, one in which the surgical team can function with an outcome that patient is as positive as possible. A research result of one study shows that one of the most effective ways of containing hospital acquired infections is through the application of a standardized aseptic technique for clinical procedures. Clients in health care settings are usually vulnerable to infection because they are in high-risk groups. Nosocomial infections result from delivery of health services in a health care facility. Clients may acquire nosocomial infections during their stay in a facility. Health care works may also acquire them as a result of contacting infectious organisms in the workplace [1].

People, rather than the equipment, are the real obstacles to the creation and maintenance of a safe environment. Nursing

considerations for patients undergoing surgery have been refined to emphasize the importance of cleanliness and elimination of all infectious agents, which defines "Asepsis". The knowledge that bacteria exist and are capable of causing-disease and act as transmissible agent was acquired in the nineteenth century. Not until the mid-nineteenth century when the principle of asepsis is developed as we knew it today. Techniques directed at cleanliness and the elimination of all infectious agents is universally applied on a daily basis within the healthcare industries. Cleanliness of environment, adherence to proper hand washing technique, application of aseptic technique, clean linens and uniforms are all important in the prevention of infection. Aseptic technique is a general term involving practices that minimize the introduction of microorganisms to patients during patient care. There are two categories of asepsis; general asepsis which applies to patient care procedures outside the operating theatre and surgical asepsis relating to procedures/processes designed to prevent surgical site infection [2]. With this, the authors were challenged to know the extent of compliance on the standard of preoperative surgical asepsis by the scrub nurses in two hospitals with functional operating theaters and to validate if there is a difference on level of significance according to race for the intention of identifying what key area/s can be subjected for further enhancement.

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## 2. Methodology

Descriptive comparative design was employed and the source of data were scrub nurses assigned in two hospitals with functioning operating theaters in Misurata, Libya. There are three identified races of Scrub nurses and these are Africans (Libyans and Egyptians); Asians (Filipinos and Indians); and Europeans (Ukrainians and Bulgarian). An evaluation checklist comprising the key areas of preoperative surgical aseptic techniques or asepsis was utilized to gather necessary data by the researchers as they conduct direct and actual observation in appraising the compliance of the scrub nurses to standard of preoperative surgical asepsis while at work. Preoperative surgical asepsis has four key areas in which theater dress is the first and items in this category used in evaluating the compliance of the scrub nurses are lifted from a book authored by Colmer [3]. The surgical mask is the second key area and its indicators used to gauge the compliance of the respondents are from the book of White [4]); and the book of Ellis [5] is the source of the indicators utilized to assess the compliance of scrub nurses on the key areas of surgical hand washing, gowning and gloving. Likert Scale was used to quantify observations. Collected data were tallied and subsequently subjected to statistical treatment using the *Statistical Package for Social Sciences Version 20.0 (SPSS)* employing one-way Analysis of Variance (ANOVA) or F-test for the equality of means between races of the respondents.

## 3. Results

### 3.1. Profile of the Respondents

The source of data were twenty seven (27) scrub nurses who are currently employed in two hospitals (Al-shefa and Abu-shallah) with functional operating theaters and they are Africans, Asians and Europeans by race. There are 15 Africans where 13 are Libyans and the rest are Egyptians that covers the 55.56% of the total scrub nurses; 9 Asians (5 are Indians and the 4 are Filipinos) took the second numbered respondents with 33.33%; and 3 or 11.11% are Europeans in which 2 among them are Ukrainians and a Bulgarian. The longest in length of work experience incurred by the scrub nurses is 34 years that is found among Europeans and the shortest is 2 years and is found from the Asians.

### 3.2. Compliance to Standard of Preoperative Surgical Asepsis

Table 1 presents how scrub nurses are compliant to standards of preoperative surgical asepsis in two hospitals with functional operating theater in Misurata, Libya. Generally, scrub nurses are highly compliant to the standards of preoperative aseptic technique/asepsis with over-all weighted mean of 4.34. As per key areas, two from the four were greatly complied and these are surgical gowning and gloving, and theater dress with weighted means of 4.95 and 4.80 respectively. On the other way around, scrub nurses are

highly compliant in surgical hand washing key area with weighted mean of 4.50. Lastly, the surgical mask key area was considered moderately complied as observed with weighted mean of 3.11.

**Table 1.** Compliance to Standard of Preoperative Surgical Asepsis

| Key Area                      | Mean | Standard Deviation | Descriptive Equivalent |
|-------------------------------|------|--------------------|------------------------|
| Theater Dress                 | 4.80 | 0.28               | Great Compliance       |
| Surgical Mask                 | 3.11 | 0.27               | Moderate Compliance    |
| Surgical Hand Washing         | 4.50 | 0.20               | High Compliance        |
| Surgical Gowning and Gloving  | 4.95 | 0.03               | Great Compliance       |
| Over-all Extent of Compliance | 4.34 | 0.84               | High Compliance        |

*Great Compliance = 4.51-5.00; High Compliance = 3.41-4.50; Moderate Compliance = 2.51-3.50; Less Compliance = 1.51-2.50; Poor Compliance = 0.00-1.50*

### 3.3. Differences in Compliance to Standard of Preoperative Surgical Asepsis

Table 2 shows differences on compliance to standard of preoperative surgical asepsis per key areas by race. Along with the theater dress, the F-value is 0.869 and the  $P = 0.452$ . The findings guided the authors to conclude that there is no statistically significant difference between races of scrub nurses which is same as with the key areas of surgical mask (F-value=0.114;  $P=0.893$ ); surgical hand washing (F-value=0.539;  $P=0.590$ ); and surgical gowning and gloving (F-value=0.287;  $P=0.754$ ). The differences between means per race are likely due to chance and not likely due to the compliance to standard of preoperative surgical asepsis.

**Table 2.** Differences in Compliance to Standard According to Race

| Key Area                     | Race     | Mean | Standard Deviation | F - value | P     |
|------------------------------|----------|------|--------------------|-----------|-------|
| Theater Dress                | African  | 4.48 | 1.04               | 0.869     | 0.452 |
|                              | Asian    | 4.93 | 0.10               |           |       |
|                              | European | 5.00 | 0.00               |           |       |
| Surgical Mask                | African  | 2.84 | 1.93               | 0.114     | 0.893 |
|                              | Asian    | 3.09 | 1.95               |           |       |
|                              | European | 3.40 | 1.63               |           |       |
| Surgical Hand Washing        | African  | 4.43 | 1.01               | 0.539     | 0.590 |
|                              | Asian    | 4.35 | 1.08               |           |       |
|                              | European | 4.73 | 0.51               |           |       |
| Surgical Gowning and Gloving | African  | 4.98 | 0.06               | 0.287     | 0.754 |
|                              | Asian    | 4.94 | 0.10               |           |       |
|                              | European | 4.93 | 0.19               |           |       |

## 4. Discussion

It is the goal of any field related to health and medicine to

control or to break the chain of infection for it may give additional burden to any individual who may incur this scenario. This goal directed the authors to dig into compliance of asepsis particularly in preoperative phase for the belief that this is the starting point where chain of infection occurs if not that much complied. In this study, scrub nurses are highly compliant to standards of preoperative surgical asepsis and found no significant difference according to race per key area. Though authors are expecting that compliance of scrub nurses should be great and performed excellently, there is a situation that persists in today's nursing practice referred to as the "theory-practice gap" where theory and practice are interacting improperly, uncommonly, and sometimes irrelevantly most especially that they have different educational qualifications. It is true that length of work experience has to be considered as frequent practice makes a certain task be performed perfectly but knowing reasons why such thing to be done is essential to be able to completely understand why compliance needs to be observed. Scrub nurses must think that the ultimate purpose of preoperative surgical asepsis is on prevention of infection to the patient.

Although all races are with great compliance to operating theater dress, Africans were been observed of moderate compliance as to wearing of surgical cap before the operation. Upon looking closely and by the report of observations, it was because most of the African scrub nurses are females where they are usually wear hijab, a veil that covers the head and chest instead of a disposable cap. Braswell and Spruce stated that [6] all personal clothing should be completely covered by the surgical attire. Surgical hand washing has been observed as great on compliance to preoperative surgical asepsis but some variability was found in which some races were found to be from moderate to high compliance. Indicators involved in differences were observed in which some Africans and Europeans do not maintain short nails that made them high compliant. Asians are fond of using jewelries, Indians in particular that made them highly compliant as observed but again, Braswell and Spruce [6] said that jewelry, including earrings, necklaces, watches, and bracelets that cannot be contained or confined within the scrub attire should not be worn. In India, it will be considered impolite if women go out without any jewelry. It is also very common that men wear jewelry [7]. This is maybe the reason why Asians particularly the Indians sometimes forgot to remove their jewelries but can be covered by the sleeves of the surgical gown. Most especially if there is fast turnover of patients for surgery and yet minimal scrub nurses are on duty. Though, this practice should be avoided most especially inside the operating theater. Removing all watches, rings and bracelets is part of the preparation before doing surgical hand washing, [5] for jewelry and watches harbor microorganisms beneath them [8]. Additionally, Asians prefer to wash their hands with the use of an alcohol-based antiseptic surgical hand rub rather than a liquid soap. This is acceptable according to the revised recommendation of the Association of perioperative

registered Nurses [9] in performing a surgical hand scrub before donning sterile gloves, and noted that healthcare providers could use an antimicrobial surgical scrub agent or an alcohol-based antiseptic surgical hand rub that met Food and Drug Authority requirements for surgical hand antisepsis. This scrub can be done with water aided brushless surgical hand antiseptics, waterless and brushless surgical hand antiseptics or traditional surgical hand scrub using a sponge. This is same as with Africans in washing hands and finger with rigorous movement that requires at least 10-15 seconds. Finger nails is an additional issue when it comes to infection control, it was observed that Africans and Europeans are with high compliance in keeping finger nails short comparing to Asians that are with great compliance. On the other way around, all races are from moderate to high compliance in terms of cleaning finger nails with brush. It is untoward because both hospital uses traditional scrub in which the nail cleaner is included with the scrub sponge. Scrub nurses must cleanse the underneath of nail tip (subungal) at the first scrub of the day. This area can easily harbor microorganisms so it is a must to be cleansed at the first time of scrubbing of the day and ensure that fingernails are in good condition without nail polish or artificial nails. Additionally, because of moisture being trapped between the natural and artificial nails, fungal growth often occurs under artificial nails and long nails may puncture gloves [5].

On the other hand, principles or standard on surgical mask was poorly performed as observed that made the scrub nurses less compliant. This is an awful finding so the authors probe what's really the cause of this matter. It has been found that all of them have poor compliance in doing hand washing before wearing the surgical mask. This significant remarks came to researcher's attention only to found that the transition from one surgical procedure to another surgery is only limited from 10 -15 minutes. This doesn't give enough time for the scrub nurses to do hand washing in between before wearing new mask as they're busy preparing the area and other needed supplies and instruments for operation. One more thing, there are minimal numbers of scrub nurses on duty per shift because of the current safety and security status of Libya due to political conflict where most of the foreign scrub nurses went home to their country of origin. Africans and Asians are poor and Europeans are less compliant in the proper use of mask. The mask protects the vulnerable patient from exposure to microorganisms that might be in the respiratory tract of the health care professional. In addition, Africans are poor and Asians are moderately compliant in terms that mask should cover the mouth and nose. Both of these should be observed strictly as it was said that proper use of mask is describe as the mask covers both nose and mouth and the masks fits the face by molding the nosepiece to the bridge of the nose [5].

## 5. Conclusions

The authors pointed out how scrub nurses comply with the standard of preoperative surgical asepsis and that compliance

is commonly depends on some elements that may influence the one who is complying. Based on the findings and the data presented, there are three identified races employed as a scrub nurses in two hospitals with functional operating theaters in Misurata, Libya. Most of them are Africans and they are Libyans in particular. Europeans are least among them. On the other hand, 34 years is the longest length of work experience incurred by the respondents as scrub nurse and the two years is the least.

Furthermore, scrub nurses are greatly compliant in theater dress and surgical gowning and gloving key areas while they are highly compliant in the surgical hand washing but moderately compliant in the surgical mask key area.

Moreover, compliance of scrub nurses to standard of preoperative surgical asepsis has no significant difference different key areas as to race.

Finally, the researchers therefore conclude that scrub nurses are highly compliant to standard of preoperative surgical asepsis in which there is no significant difference on complying as to race; however, certain enhancements should still be made to achieve perfection in complying the standard.

## 6. Recommendations

Nurses' are the ultimate health care professionals that have more time and direct contacts with clients. They are partners of other health care professionals in the promotion of health, prevention of illness, managing health problems and the restoration of health. In relation to the findings and conclusion, scrub nurses needs to be well equipped on concepts and skills in giving health care particularly on preoperative surgical asepsis, the authors decided to suggest the following:

1. The hospital administration have to plan for continuing education program on perioperative asepsis to give the scrub nurses some updates and reinforcement such as post graduate studies, training and seminars as well as bridging program to Bachelor of Science in Nursing for majority of the Libyan scrub nurses are simply trained and/or obtained a diploma from the higher institute. Operating theater is a specialized area that nurses must have better educational qualification.
2. There must be cooperation among health team members in the observance and strict implementation of the standard in order not to lead into breaking the chain of infection.
3. Scrub Nurses must be aware of unnecessary clothing and accessories they are bringing inside the operating theater which also be avoided to be worn inside the area.

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## Conflict of Interest

There is no professional, personal or family allegiance, bias, inclination, obligation or loyalty which may in any way affect the objectivity, independence or impartiality in making this research.

## REFERENCES

- [1] Garden, J, Andrew W, John L, Forsythe and Rowan, W., 2007, Principles and Practice of Surgery, 5<sup>th</sup> Edition, Oxford Philadelphia, Chapter 6: PP 61, 65, 69.
- [2] Clement, I., 2007, Basic concepts on nursing procedures, Jaypee Brothers Medical Publishers Ltd, Chapter 8: PP52-56.
- [3] Colmer, M.R., 2006, Moroney's surgery for nurses, 16th edition, Reed Elsevier India Private limited, pages 88-89.
- [4] White, L., 2005, Foundation of Nursing, 2<sup>nd</sup> Ed., Thomson Delmar Learning, PP 530-531.
- [5] Ellis, J.R. and Bentz, P. M., 2006, Modules for Basic Nursing Skills, 7<sup>th</sup> Edition, Lippincott Williams & Wilkins, PP 482-483, 484, 488-499.
- [6] Braswell, M. L. and Spruce, L., Implementing AORN Recommended Practices for Surgical Attire, AORN Journal, January 2012 Vol 95 No 1, p 130.
- [7] Yao Chun, Indian beauties wearing gold jewelry, People's Daily Online, 08:10, August 28, 2012, <http://en.people.cn/90777/7925602.html>.
- [8] Centers for Disease Control and Prevention. Guidelines for hand hygiene in health-care settings, Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. MMWR. 2002; 51(RR-16):17-18. <http://www.cdc.gov/mmwr/PDF/rr/rr5116.pdf>. [Context Link].
- [9] Association of peri Operative Registered Nurses. Recommended practices for hand hygiene in the perioperative setting. Perioperative Standards and Recommended Practices 2010 Edition. Denver, CO: Rank: (9.20).AORN; 2010:75-89. [Context Link].