



ORIGINAL RESEARCH ARTICLE

PRACTICE OF GOWNING AND GLOVING TECHNIQUE AMONG HEALTH PERSONNEL AT OPERATION THEATRE OF TEACHING HOSPITAL, BHARATPUR

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ABSTRACT

Background: Gowning and gloving is regarded as the basic component of modern Surgery, its standard of practice is directly concerned with patient safety and infection prevention. The aim of this study was to observe the practice of gowning and gloving technique among health personnel at operation theatre of teaching hospital, Bharatpur, Nepal.

Methods: A descriptive cross-sectional study was carried out among 90 health personnel who had scrubbed in the operation theatre before approached to sterile field, by using observational checklist. Sample was selected by using non probability, consecutive sampling technique. Data were analyzed using descriptive and inferential statistics to find the association between the variable.

Results: The findings highlighted, that only 36.7% of the health personnel fulfill the criteria of surgical gowning and gloving. The main issues found in the study were not picking up the entire folded gown through all layers from the wrapper (31.1%), and not holding the gown near the gown's neck and touch unsterile objects (18.9%).

Conclusions: The level of practice on gowning and gloving technique was statistically significant with professional experience and education of the respondents. Hence, operation theatre department should develop the audit protocol and in-service training model for the surgical team.



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INTRODUCTION

Surgical site infection (SSI) is the major concerns for perioperative team.¹ It is the most frequently encountered type of nosocomial infection in patients who experienced surgical procedures², and threats the lives of million people each year lead to antibiotic resistance infections³. Centers of Disease Control and Prevention (CDC) shows that about 2,90,000 SSI's occur annually in United States (US), costing \$3 to \$8 billion dollars and cause death of 13,000. Further, it estimated that 26-54% of infections can be preventable.⁴ SSI is caused by endogenous and exogenous factors, about four-fifth (80%) of the infections are caused by endogenous flora of patient's derma and mucous membrane. When mucous membrane or skin is incised, the exposed tissue are at the risk for contamination,⁵20% can be traced to operating room and can therefore be minimized by aseptic technique.⁶ Gowning and gloving are the vital steps done before surgery, following standard of practice directly adhered with infection prevention.⁷ Wearing of sterile gown and gloves by surgical team will minimizes the risk of surgical wound infection in patients and protect the team from exposure to contamination

from blood and other body fluids.⁸ Sterile technique i.e. scrubbing, gowning and gloving is regarded as the basic component of modern surgery.⁹ Sterile gowning and gloving technique remain critically important, because of increasing drug resistant pathogens in health care facilities; many patients have weakened immune system that put down patient to other comorbidities. Thus, to ensure patient safety, perioperative surgical team members are obliged to execute accurate steps to prevent microbes shed from body from the surgical site.¹⁰ Such steps are significant to reduce the burden on patient by decreasing length of hospital stay, economical burden, reoperation, readmission, complication and mortality.

METHODS

A descriptive cross-sectional study design was used to find out the practice of gowning and gloving among 90 health personnel who scrubbed in operation theatre of teaching hospital Bharatpur. Study respondents recruited through non-probability consecutive sampling technique and total of 90 health personnel were available between month of June and July, 2019 in order to collect data. Prior to data collection,

ethical approval was obtained from Institutional Review committee of Chitwan Medical College, Bharatpur, and then data was collected by researcher herself. For data collection, utilized structured observational checklist, followed target time observation method and had covert observation technique to avoid bias. The collected data were checked, reviewed and organized daily for its accuracy, completeness and consistency. Collected data were organized, coded and entered in statistical package for social science (IBM SPSS) version 20 and then was analyzed and interpreted in term of descriptive (frequency, percentage, mean and so on) and inferential statistics (Chi-square test) to draw inference of the findings.

RESULTS

The demographic information of study respondents showed that almost near fifty percent (46.7%) were less than 21 years and majority of them (58.9%) were males. In regard to profession, surgeons and residents represented about just below half of total, where around 31.1% of them had super specialization on their professional field. Respondents, who had at least one year or more work experienced in operation theatre, were fifty percent while more than 56% had one year or more total professional experience in health sector. Practiced observation was performed during morning shift was about 76.7% (Table 1).

Regarding the practice of gowning techniques, around (68.9%) respondents picked it up the entire gown from wrapper. Similarly, most of them (81.1 %) hold the gown near the gown's neck without touching unsterile objects. All the staffs who assigned for circulating area followed tasks completely like assist point to position the gown over the shoulders by grasping the inside surface of the gown at the shoulder seams, but only (94.4%) grasped the gown by inner surface and secured the gown, neck and back with a ties (Table 2).

Table 1: Socio- demographic and professional characteristics of the respondents n=90

Variable	Frequency (%)
Age	
<21 year	42(46.7)
21-39 years	30(33.3)
40-59 years	18(20.0)
Sex	
Male	53(58.9)
Female	37(41.1)
Profession	
Registered Nurse	17(18.9)
Surgeon	28(31.1)
Resident	14(15.6)
Intern(MBBS)	31(34.4)
Education	
PCL Nursing	14(15.6)
Bachelor	34(37.8)
Post Graduate	14(15.6)
Super Specialty	28(31.1)
Total Profession Experience	
<1 year	39(43.3)
1-5 years	33(36.7)
6-11 years	13(14.4)
>10 years	5(5.6)
Professional Experience in OT	
<1 year	45(50.0)
1-5 years	32(35.6)
6-10 years	9(10.0)
>10 years	4(4.4)
Working Shift	
Morning	69(76.7)
Evening	21(23.3)

Table 2: Respondents' practice related to gowning technique n=90

Items	Correct practice
	No. (%)
With one hand, pick up the entire folded gown from the wrapper by grasping the gown through all layers, being careful to touch only the inside top layer which is exposed. Step back from the trolley*	62(68.9)
Hold the gown near the gown's neck and allow it to unfold being careful that it does not touch either the body or other un-sterile objects and grasp the inside shoulder seams and open the gown with armholes facing *	73(81.1)
Slide arms part way into the sleeves of the gown keeping hands at shoulder level away from the body*	81(90.0)
Slide arms further into the gown sleeves and when the fingertips are level with the proximal edge of the cuff, grasp the inside seam at the cuff hem using thumb and index finger. Be careful that no part of the hand protrudes from the sleeves cuff.	90(100.0)
The circulating person should assist at this point to position the gown over the shoulders by grasping the inside surface of the gown at the shoulder seams. They can then adjust the gown over the scrub person's shoulders.	90(100.0)
The circulating person's hands are only in contact with the inside surface of the gown.	85(94.4)
The circulating person secure the gown, the neck and back with a ties. The circulating person then ties the gown at waist level at the back	90(100.0)

*Critical steps

Table 3: Respondents' practice related to gloving technique n = 90

Items	Correct practice No. (%)
Pick up the cuff of the right glove with left hand.	89(98.9)
Slide right hand into the glove until snugly fit over the thumb joints and knuckles.*	71(78.9)
Bare left hand should only touch the folded cuff – the rest of the glove remains sterile.	81(90.0)
Slide the fingertips into the folded cuff of the left glove. *	67(74.4)
Place the fingers of the gloved right hand under the cuff of the partially gloved left hand. Unfold the cuff down over gown sleeves.	73(81.1)
Make sure gloved finger tips do not touch bare forearms or wrists. *	89(98.9)
Do not keep hand below mid-chest or waist line. *	90(100.0)

*Critical steps

Practice of gloving technique, respondents (98.9%) picked it up the cuff of right glove with left hand and slide hand into it whereas almost three-fourth of them used gloved left hand and folded cuff of right glove. Only negligible percent

of respondents (1.1%) touched bare forearms with gloved fingertips. None of the respondents kept hand below mid-chest line (Table 3).

Table 4: Practiced scores obtained by respondents on gloving and gowning n= 90

Domain	Obtained Minimum	Score Maximum	Maximum Possible Score	Mean ± SD	Mean%
Gowning	3	7	7	6.344±0.823	90.634
Gloving	3	7	7	6.222±1.089	88.88
Total	8	14	14	12.56±1.506	89.763%

The overall practiced related domains like gowning and gloving reflected that 6.344±0.823 and 6.222±1.089 respectively (Table 4).

Based on developed criteria of scoring good and poor practice, only about one third of respondents (36.7%) were able to demonstrate good level of practice while donning surgical gown and gloves (Table 5).

Table 5: Respondents' level of practice on surgical gowning and gloving n = 90

Level of Practice	Frequency (%)
Good	33 (36.7)
Poor	57 (63.3)
Total	90 (100.0)

Table 6: Association between level of practice and selected variable n =90

Variables	Level of Practice		χ ²	p-value
	GoodNo.(%)	Poor(%)		
Age				
<21	16(38.1)	26(61.9)	0.219	0.896
21-39	10(33.3)	20(66.7)		
40-59	7(38.9)	11(61.1)		
Sex				
Male	20(37.7)	33(62.3)	0.063	0.801
Female	13(35.1)	24(64.9)		
Profession				
Registered Nurse	12(70.6)	5(29.4)	12.902	0.005*
Surgeon	9(32.1)	19(67.9)		
Resident	6(42.9)	8(57.1)		
Intern	6(19.4)	25(80.6)		
Education				
PCL Nursing	10(71.4)	4(28.6)	10.290	0.016*
Bachelor	8(23.5)	26(76.5)		
Resident	6(42.9)	8(57.1)		
Supers peciality	9(32.1)	19(67.9)		
Total Profession Experience				

<1years	10(25.6)	29(74.4)	4.216	0.242 ^f
1-5 years	16(48.5)	17(51.5)		
6-10 years	5(38.5)	8(61.5)		
>10 years	2(40.0)	3(60.0)		
Profession Experience in OT				
<1 years	14(31.1)	31(68.9)	1.641	0.671 ^f
1-5 years	13(40.6)	19(59.4)		
6-10 years	4(44.4)	5(50.0)		
>10 years	2(50.0)	2(50.0)		
Working Shift				
Morning shift	23(33.3)	46(66.7)	1.415	0.234
Evening shift	10(47.6)	11(52.4)		

Significance level at <0.05,* denotes significant^f=Fisher exact test

Respondent's academic achievement and professional background were statistically associated with practice of surgical gowning and gloving techniques (Table 6).

DISCUSSION

The current study was conducted to find out the practice of gowning and gloving technique among health personnel at operation theatre, Bharatpur. The present study found that the overall mean percent of compliance score was about 89.763% which was consisted (100% respondents gloved and gown properly) with previous research findings that conducted in similar setting.¹¹ The reason of this finding might be due to the awareness among health personnel regarding the patient safety. However, this finding was inconsistent with the finding conducted in South India 68.75%.¹ similarly, 36.7% of respondents (n=90) had good (>90% score with or without missing critical steps) level of practice on surgical gowning and gloving, which was contrast with the findings of existed literature where limited percent of respondents practiced aseptic technique in good manner.¹⁵ It highlights the need for periodic reinforcement and motivation to health personnel in practice of sterile technique as per existing protocol so as to reduce the SSI burden and positive patient outcome.

Regarding gowning procedure, 18.9% touched unsterile object and missed holding the gowns near the neck. The finding of this study was supported from previous literature which found 28.9% touched outside of sterile gown.¹¹ But, this finding was inconsistent with the finding conducted by Pierre which revealed that 56.3% of respondent reported touching anywhere on sterile gown.¹² The reason of this finding might be due to lack of in-service training for all surgical team members.

The total mean percentage score of gloving was 88.88% which was near similar with previous findings that showed 81.5% respondents adopted aseptic technique in donning gloves¹³. Likewise Jeyakumar et al highlighted that almost all (98.6%) demonstrated very good technique for donning gloves whilst, practice of gloving technique about one quarter of respondents

forgot to use gloved left hand to pick up folded cuff of right glove and pull the glove to gowned wrist.¹⁴ Similar findings were found in studies conducted in Indonesia which shows the lowest mean score (1.97 ± .158 of the maximum score of 2).¹⁵

Similarly, current study found that the level of practice on surgical gowning and gloving is statistically significant with profession and educational qualification of the respondents. Similar findings were found in the studies conducted in Nepal¹¹ and Rwanda hospital.¹²

Based on selection of research setting, there was limitation to generalize findings of the study while those data might be valuable baseline reference for studied area to enhance surgical team's competency through developing training and guiding strategic actions. At last, health personnel from different corner of the country can recruit in the teaching hospital so that results could be meaningful for similar setting for further audit of surgical gowning and gloving techniques.

CONCLUSION

It can be concluded that only around one third of the health personnel implied good level of practice regarding gowning and gloving which were directly associated with their academic award and professional experience. So Operation Theatre Department should develop the audit protocol as well as in-service training module for surgical team in order to update them more competent and to ensure safety of the operated client.

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CONFLICT OF INTEREST: None

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