

ORIGINAL ARTICLE

Nurses' Knowledge and Practice Regarding Prevention of Surgical Site Infection at Governmental Hospitals in Wasit City, Iraq 2022AMINA HILAL HASSAN¹, DARYADOKHT MASROR-ROUDSARY²¹MSN, Academic Nurse, Wasit Health Directorate, Wasit, Iraq²Dept. of Medical Surgical Nursing, School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran.Correspondence to: Amina Hilal Hassan, Email: hilalhassan335@gmail.com**ABSTRACT****Objective:** The study was aimed at determining nursing knowledge and practices regarding prevention of surgical site infection in governmental hospitals in Wasit city.**Methods:** This cross-sectional study was conducted with descriptive design to determine knowledge and practice of nurses who work in surgical wards regarding prevention of SSI in governmental hospitals in Wasit City. A sample of 180 surgical nurses participated in the study (100% response rate); convenience sampling method was used in this study. The instrument used for data collection was a questionnaire which is composed of three parts: Demographic characteristics, Nurses' knowledge questionnaire, and Nurses' practice questionnaire.**Results:** The results of current study revealed that (58.3%) of the nurses expressed a poor knowledge regarding SSI as described by low average, which is equivalent to 7.68 (± 7.441), and (75.6%) of the nurses expressed an inadequate practice regarding SSI as described by low average, which is equivalent to 36.89 (± 13.55). The results show that nurses practices is positively significant correlated with their knowledge ($r = 0.216$; $p = 0.000$).**Conclusion:** Knowledge and practices among nurses working in surgical wards in governmental hospitals (both teaching and non-teaching) in Wasit city regarding SSI prevention were found to be low. Being male with high educational level were factors which were significantly associated with knowledge of prevention of SSI. On the other hand, serving for 1–5 years is a factor that was significantly associated with the practice of SSI prevention activities. Therefore, efforts have to be made to update the knowledge of nurses regarding SSI prevention activities. Additionally, hospital administrators ought to motivate highly educated nurses to concentrate on putting their learning into practice.**INTRODUCTION**

Surgical Site Infection (SSI) is defined as infection that occurring within 30 days after surgical procedure or within a year of implantation of prosthesis. Surgical Site Infection can happen in up to 30% of surgical procedures and records for up to 14% of Hospital Acquired Infection (HAIs) (1).

An SSI is a frequent healthcare-associated illness that can cause severe discomfort in patients, as well as prolonged hospitalization and increased costs (2).

According to the (CDC), around 500,000 SSI occur each year, accounting for 3% of surgical mortality, longer hospital stays, and higher medical expenses. (3). According to a prevalence survey, SSIs account for 31% of all HAIs among hospitalized patients. Depending on the surgical process and the quality of the data acquired, the incidence of SSIs in Europe might reach over 20%. SSIs are linked to longer hospital stays, readmissions, interventions, lifelong impairment, and even mortality. Furthermore, statistics from the United States suggest that between 38.7 and 50.9 percent of microorganisms isolated from infected surgical wounds exhibit antibiotic resistance patterns. (4).

Based on the study findings, it can be concluded that the nurses in the present study had poor level of knowledge (58.3%) and low level of practices (75.6%) regarding prevention of SSI. Moreover, the results show that nurses practices is positively significant correlated with their knowledge ($r = 0.216$; $p = 0.000$).

Considering the importance and significance of nurses in the healthcare settings, this study was carried out to determine the level of their knowledge and practices towards prevention of SSI in governmental hospitals (both teaching and non-teaching) in Wasit city in order to find a best way for solving the problem and to alleviate the suffering of patients and reduce the economic burden on the health care system, reduce hospital stay and fewer consequences. Furthermore, the results of this study will benefit for the further research in nursing profession.

METHODOLOGY

The descriptive design was used for this cross-sectional study. This study will be conducted on (N=180) nursing professionals working in surgical wards in governmental hospitals in Wasit City (Al- Karama teaching Hospital, Al- Kut hospital for Maternity & Pediatrics, Al- Zahra teaching Hospital, Al- Shaheed Fairouz

Hospital, Al- Numaniyah General Hospital, Al- Hajj Jalal Hospital for Maternity & Pediatrics, Al- Azizia General Hospital, Al - Ssaouira General Hospital).

For this research, using convenience sampling method staff nurses who held the following educational degree in nursing: (Secondary school nursing, Diploma in Nursing and B.Sc in Nursing) working in surgical wards (both teaching and non-teaching) in Wasit City, will be involved in the study.

Ethical approval and code are obtained from the Iran University of Medical Sciences, Tehran, Iran, and Waste Health directorate, Iraq. Informed consents are obtained from all study participants after explaining the data collection method and study procedures.

The current research includes a demographic characteristic, nurses' knowledge, and practice regarding the prevention of SSI questionnaire was assessed by 25 multiple response questions as follows: each question has a group of three and four answers. One point will be awarded for each correct answer; incorrect answer took zero. The total scores range from 0-25. Higher scores will indicate higher level of knowledge. Nurses' practice regarding the prevention of surgical site infection questionnaire will be assessed by 25 statements using a 3-item rating scale (ranging from never practice=1, Sometimes practice=2, Always practice=3. The total scores range from 0-75. The higher scores will indicate higher level of practice. It will take about 15-20 minutes to complete these questionnaires. Then, the data was analyzed by descriptive and inferential statistical tests in SPSS software version 22. A significant level of $P < 0.005$ will be considered.**RESULTS OF THE STUDY**

The data analysis systematically presented in tables corresponded with the objectives of the study as follows:

Out of (180) subjects participating in this study, their age ranged from 21-30 years old (58.3%) at mean age (31.27). In terms of gender, half of studied sample were male (51.1%) as compared with female (48.9%). Marital status related findings, most of sample were married (67.2%). Concerning education, nurses expressed a school nursing graduated (45.6%), nurses had less than 5 years of experiences (40.0%), most of them were less than one years in surgical wards (67.2%), and more than half were not attended training (53.3%).

Table 1: Distribution of Studied Sample by their Socio-Demographic Variables (SDVs)

SDVs	Rating	No.	%
Age/years (M± SD= 31.27±9.42)	21-30 years old	105	58.3
	31-40 years old	47	26.1
	41-50 years old	13	7.2
	+50 years old	15	8.3
Gender	Male	92	51.1
	Female	88	48.9
Marital status	Married	121	67.2
	Single	55	30.6
	Widow	4	2.2
Educational Level	School nursing	82	45.6
	Diploma nursing	80	44.4
	B.Sc. nursing	18	10.0
Workplace	Male surgical ward	90	50.0
	Female surgical ward	90	50.0
Years of Experience	0-5 years	72	40.0
	6-10 years	61	33.9
	11-15 years	19	10.6
	16-20 years	8	4.4
	+20 years	20	11.1
Years of experience in surgical wards	<1 year	121	67.2
	1-5 years	44	24.4
	>5 years	15	8.3
Training Sessions	No trained	96	53.3
	1-2 session	19	10.6
	3-4 sessions	32	17.8
	>5 sessions	33	18.3

No.= number; %= percentage

Table 2: Overall Assessment of Nurses Knowledge Regarding Surgical Site Infection (SSI)

Knowledge Level	No.	%	M (±SD)
Poor (M=0-8.33)	105	58.3	7.68±7.441
Fair (M=8.34-16.66)	39	21.7	
Good (M=16.67-25)	36	20.0	
Total	180	100.0	

M: Mean for total score, SD=Standard Deviation for total score

The results showed that (20%) of nurses were good knowledge, (21.7%) were fair knowledge and (58.3%) of the nurses expressed a poor knowledge regarding surgical site infection as described by low average, which is equivalent to 7.68 (±7.441).

Table 3: Overall Assessment of Nurses Practices Regarding Surgical Site Infection (SSI)

Practices Level	No.	%	M (±SD)
Inadequate (M=25-41.66)	136	75.6	36.89±13.55
Fairly (M=41.67-58.33)	25	13.9	
Adequate (M=58.34-75)	19	10.6	
Total	180	100.0	

M: Mean for total score, SD=Standard Deviation for total score

The results showed that (10.6%) of nurses were adequate practices, (13.9%) were fairly practices and (75.6%) of the nurses expressed an inadequate practices regarding surgical site infection as described by low average, which is equivalent to 36.89 (±13.55).

Table 4: Correlation between Nurses Knowledge and practices regarding SSI (n=180)

Spearman's Correlation	Nurses Knowledge	Nurses Practices
Nurses Knowledge	-	.216**
Nurses Practices	.216**	-

** Correlation is significant at the 0.01 level (2-tailed).

The results show that nurses practices is positively significant correlated with their knowledge (r = 0.216; p = 0.000).

DISCUSSION

Out of (180) subjects participating in this study, almost half of them their age ranged from 21-30 years old (58.3%) at mean age

(31.27), this finding illustrates the policy of the higher health authorities to employ new graduates to fill the shortage of nursing staff, and also because most of the sample members hold a school nursing and diploma degree in nursing.

The findings of the present study are consistent with a study conducted by Jaleta (6), who found that out of 256 participants (67.4 %) of the study sample is in the age group (20-29) years.

In terms of gender, half of studied sample were males (n=92; 51.1%) as compared with female (n=88; 48.9%). The majority of the sample were male because most of the nurses working in the surgical wards were males. These findings are in the same line as the study which conducted to assess knowledge, practice, and associated factors of nurses towards the prevention of SSIs. Which revealed that out of 423 participant that 239 of them (56.5%) were males.(8).

Marital status related findings, most of sample were married (n= 121; 67.2%). compared to those still single; the result comes because most of these age groups are the age of marriage, especially after the completion of the study and appointment in the field of nursing. After graduating from study and finding employment opportunities, the Iraqi young take the side of marriage .

these results agreed with the study of Sham (11)who reported that the number of married nurses (83.7%) was more than the number of unmarried. Also, a study done by Novelia (12) found that the majority of the participants (71.1%) were married.

Concerning to the educational level, there are three educational levels because the presence of these levels only in the Surgical Wards. The results declared that the majority of the educational levels were nurses who graduate from nursing secondary school (n= 82; 45.6%), because the school was the oldest in comparison with the institute and college of nursing; in addition, the college was recently formed in Wasite Governorate. These results are supported by the study of AL-Salih (14), which mentioned that the nursing secondary school had the highest percentage (55%).

Following the nursing secondary school level education in current study which (n= 80; 44.4%) of participants have diploma in nursing, and only (n= 18; 10.0%) have B.Sc. nursing.

This result was in line with a study done by Abd Elhay (15) in Egypt , which reported that 50% of the nurses who participated in the study had attended a nursing school, 40% had a diploma from a health technical institute, and 10% had graduated from a nursing faculty.

Regarding years of work experiences in current study, nurses had less than 5 years of experiences (40.0%) toward SSI. Both Novelia (12) and Desalew (7) supported the result of this study, where reported that the major of respondents had experience for less than five years.

In term of years experiences in surgical wards in current study, most of them were less than one years in surgical wards (67.2%). Moreover, the study reported that nurses with ≥ 2 years of surgical experience were almost three times more likely to have a good understanding of postoperative wound care compared to nurses with less than 2 years of surgical experience (AOR = 2, 97 [1.10, 8.02]),(17, 18).

Regarding of attended training sessions of nurses to gain better and more knowledge regarding prevention of SSI , It appeared in the results of this study that the number of nurses those who have an education and training sessions regarding SSI prevention >5 sessions was only 33 subjects (18.3%) .While nurses who do not have education and training sessions regarding SSI prevention was more than half of 96 subjects (53.3%).

This study finding was in contrast with a cross-sectional study conducted in one of the tertiary institutes in western Maharashtra, India, attempted to assess knowledge and practices of health care professionals to decrease incidence of SSI and to determine their relationship with each other. This study revealed that nearly 60% of participants had no previous infection control training, (20).

A study was disagree with this study finding , showed that 66.7% of participants had participated in the training program fewer than five times over the previous two years, (21).

The results have shown that the level of total knowledge regarding SSI prevention in this group of subjects was at the low level (marginal to moderate level) ($M = 7.68\%$, $SD = 7.441\%$) with the minimal scores of 20.0 % and the maximum scores of 58.3%.

Contrarily, this result was higher than that of a study from Sonia University in Lebanon, where the results showed that 29% of nurses had poor knowledge of the SSI. A study from India also showed that 29% of nurses had poor knowledge, with a mean score of 2.61. Similar findings were found in studies conducted in Pakistan (6%), and Ethiopia showed that 7.6% of nurses at the Amhara regional hospital were not knowledgeable. A study which was conducted in Ethiopia the finding shows that 51.8% of nurse were not knowledgeable toward prevention of SSI (6, 8, 22-24).

While the results of the current study were lower than those of a study conducted at the University of Lahore, Pakistan, which found that the majority of nurses had low levels of knowledge, a studies conducted in Bangladesh, where 70% of staff nurses had poor knowledge; the Maldives, where 60.2% of staff nurses had low levels of knowledge; and India, where 70% of staff nurses had poor of knowledge regarding the prevention of SSI (5, 13, 20, 25).

This study finding was in contrast with another cross-sectional study conducted in one of the tertiary institutes in western Maharashtra, India, attempted to assess knowledge and practices of health care professionals to decrease incidence of SSI and to determine their relationship with each other. This study revealed that 70% of staff nurses had inadequate knowledge regarding the prevention of SSI (20).

This study it was revealed that the average practicing scores of the nurses were low responses towards practices regarding SSI prevention. The results showed that (10.6%) of nurses were adequate practices, (13.9%) were fairly practices and (75.6%) of the nurses expressed an inadequate practices regarding SSI as described by low average, which is equivalent to ($M= 36.89\%$, $SD=13.55\%$).

Nursing practices regarding SSI prevention may be impacted by the workplace environment. The availability of resources including water, washbasins, gloves, masks, and hand soap can help nurses perform good practice (12). An earlier study discovered a relationship between surgical infection control and adequate resources for surgical patients' care (34).

Nurses' practices for SSI prevention may be impacted by the infection control department's oversight of infection control procedures in hospitals. When nurses are under clinical supervision, they tend to perform well. Clinical supervision gives nurses the chance to enhance patient care, with a focus on improving standards of care (35).

This result was in line with a study which is done in Ethiopia which is found that 103 participants (47.2%) of the study participants found with poor practice in preventing SSI (6).

Another study conducted in Ethiopia, this study investigated nurses' level of practice in preventing SSI and found that less than half (48.9%) of nurses had good practice in preventing SSI. Conversely, it means that more than half of nurses are practicing poorly regarding of SSI prevention (2), and this finding was in line with current study.

Moreover, this finding is consistent with studies of (36) in 3 Middle Eastern countries: Jordan, Egypt, and Saudi Arabia, (37) in India and (38), as a result of nurses' poor practices to infection prevention guidelines, this indicates a significant rise in nosocomial infections.

The result of current study was disagree with a study that carried out in Cameroon, this study revealed that, more than 77.5% of the nurses had a good practices on SSI (16). A study in Saudi Arabia on "Knowledge and Practice of Wound Infection Prevention among Healthcare Professionals in Buraidah City" found that 28 out of 100% and 91.20% out of 68 respectively of nurses using good practice to prevent SSI (27).

Finally, the study's questionnaire on SSI prevention practices probably had a low level of sensitivity. Considering each item of the practice questionnaire, The majority of the items dealt with general infection control practices as opposed to SSI prevention. Therefore, the results may not be accurate or do not reflected the real practice of the nurses that participated in this study. Therefore, a version of the practice questionnaire is required for additional research.

The results of current study show that nurses practices is positively significant correlated with their knowledge ($r = 0.216$; $p = 0.000$) regarding SSI prevention. Table (5).

The present results are consistent with those of Desalew (7) who mentioned that nurse's knowledge and attitudes were significantly associated with SSI prevention practice. Meanwhile, Sadaf (10) showed that the connection between knowledge and practice is positive and association is crucial. Knowledge that affect performance may also be required. Also Sickder (39) found that nurses' insufficient knowledge about SSI prevention often compromises their level of appropriate practice in clinical settings.

Also, the present results are consistent with Kolade (40), who showed positive, moderate and significant correlations between knowledge and attitudes towards SSI prevention, just as the same relationship exists between knowledge and SSI prevention practice.

As well in some studies that demonstrated the statistically significant relations were shown between knowledge and practices among studied nurses (15). Also there was a strong and positive correlation between knowledge and practices, (16). As well Hattab (41), significant statistical associations were found between nurses knowledge and practice.

Although the current findings are inconsistent with studies by Sadia (13) and Sickder (42), which showed a strong and significant negative relationship between nurses' knowledge and practice in preventing postoperative wound infections, But knowledge is still linked to practice, but in a different direction.

CONCLUSION

This cross-sectional study was conducted with descriptive design to determine level of knowledge and practice among 180 nurses who work in surgical wards regarding prevention of SSI in governmental hospitals in Wasit City. Based on the study findings, it can be concluded that the nurses in the present study had poor level of knowledge and low level of practices regarding prevention of SSI. Moreover, the results show that nurses' practices is positively significant correlated with their knowledge ($r = 0.216$; $p = 0.000$).

Recommendations: Continuous in-service educational programs and routine monitoring should be implemented by the hospital organization to update the evidence-based knowledge and practices of nurses in order to improve the quality of care and patient safety from suffering SSI by raising the level of knowledge and practices of SSI prevention among nurses to reduce HALs. To advance knowledge and SSI prevention practice, effective standard guidelines are required, especially for nurses working in related fields.

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