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Full Length Research Paper

Knowledge, attitude and practice of surgical site infection prevention among post-operative nurses in a tertiary health institution in north-central Nigeria

Oluwakemi Ajike Kolade¹, Salisu Abubakar³, Sanusi R. Adejumo³, Hanson Victoria Funmilayo², and Adelani Tijani^{3*}

¹Department of Nursing, Ladoko Akintola University of Technology, Ogbomoso, Oyo State, Nigeria.

²Ras AL Khaimah Medical and Health Science University, RAKCON, United Arab Emirate.

³Department of Nursing Sciences, Bayero University, Kano State, Nigeria.

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Surgical operations are vital procedures in the health care delivery system. Advancement in surgery has played a pivotal role in managing and treating complex health challenges requiring the process. However, the process and procedure involved in surgical operations could significantly endanger the life of the patient. Healthcare associated infections (HAI) pose grave danger to patients and health workers alike. Empirically establishing the level of knowledge, attitude and actual practices of surgical site Infections (SSIs) infection prevention among nurses is therefore an issue for research if the alarming rate of SSIs in developing countries is to be checked. The study adopted cross-sectional survey and the population comprised surgical ward nurses in University of Ilorin Teaching Hospital, Ilorin. Data were generated using self-developed questionnaire with a reliability estimate of 0.88 on the Cronbach alpha scale. These data were analyzed using descriptive statistics of frequency counts and percentages and inferential statistics of Pearson Product Moment Correlation Coefficient at 0.01 alpha. Findings showed that respondents demonstrated relatively high level of knowledge on SSIs prevention, relatively poor attitude towards SSIs prevention and unsatisfactory level of SSIs prevention. When associations among the variables were examined, findings showed that there is positive association between all the variables studies. Findings showed that there is positive and moderate correlation between knowledge and attitude towards SSIs prevention ($r = 0.695$, $p = 0.000 < 0.01$) as well as between knowledge and practice ($r = 0.570$, $p = 0.000 < 0.01$). High correlation was however found for attitude and practice of SSIs prevention ($r = 0.763$, $p = 0.000 < 0.01$). Nurses' level of knowledge does not translate to desired attitude and practices on SSIs prevention. Improving attitude and practice of SSIs through close supervision, patients' rights education, in-service training and provision of supplies and consumables were recommended.

Key words: Surgical site infections, knowledge, attitude, practices, prevention, nurses.

INTRODUCTION

Surgical operations are vital procedures in the health care delivery system and becoming one of the most frequent

hospital procedures which is associated with post-operative morbidities (Weiser et al., 2008). Advancement

in surgery has played a pivotal role in managing and treating complex health challenges requiring the process. However, the process and procedure involved in surgery before, during and after the operations could significantly endanger the life of the patient. Healthcare Associated Infections (HAI) pose grave danger to patients and increased workload on health workers which ultimately affect the quality of nursing care (Famakinwa et al., 2014). Surgical site infection (SSI) is one of the most occurring HAI with serious consequence for patients' general condition and survival after a successful surgical intervention (Famakinwa et al., 2014). An SSI can be superficial incisional, deep incisional or organ space infection.

SSI refers to infections that occur as a result of surgical procedure and within thirty days of the procedure or 365 days if there is an implant (Mangram et al., 1999). SSIs are leading cause of HAIs particularly in developing countries (CDC, 2016); the incidence varies from hospital to hospital just as it equally varies from country to country. Available statistics show that incidence is lower in the developed countries where incidence of 2.0 to 6.4% (Anderson et al., 2008) compared to developing countries where incidence has been estimated at between 5.5 and 25% (Lohsiriwat and Lohsiriwat, 2009). Notable consequences of SSIs include but not restricted to prolonged hospital stay, high cost of care, increased psychological stress and trauma for patients and their families, low quality of life, increased risk of morbidity as well as increased risk of death. While some factors associated with SSIs are modifiable, others like age are not thereby calling for increased care among care providers.

However, risks for SSIs are classified into intrinsic extrinsic factors Famakinwa et al. (2014). While the intrinsic factors include advanced age, malnutrition, metabolic diseases, smoking, obesity, hypoxia, immune-suppression, and length of preoperative. Pre-operative skin preparation and skin antiseptics, antibiotic prophylaxis, inadequate sterilization of surgical instruments, surgical drains, surgical hands scrubs, and dressing techniques formed the extrinsic factors. All efforts of infection control among health care providers notwithstanding, infections remain a major unwanted side effect of surgical operation. This unwanted event causes serious harm to patients in both developed and resource constraint countries. The classical statement of Johan Peter Frank, Director of the General Hospital in Vienna around 1800: *Can there be a greater contradiction than a hospital disease: An evil that one acquires where one hopes to loose one's own disease?* Is very much applicable to health care even in this century. The major

problem is not the lack of effective surgical precautions and evidence-based guidelines, but possession of knowledge, development of the right attitude and intention to carry out these guidelines to prevent SSIs. Efforts to reduce the frequency and severity of surgical wound infection continue to focus on peri-operative issues, infection control practices in the operating room, surgical site preparation, timing and choice of antibiotics, and physiologic support of a patient during and immediately following the procedure.

The nurses are important members of the surgical care team that stays with the patient round the clock. It is imperative for the surgical nurses to understand the basics of pre and post-operative wound infection prevention and control. The implementation of quality measures including antibiotic prophylaxis, hair removal using a clipper, tight control of pre- and post-operative glucose levels and avoiding hypothermia are all recognized key quality measures in reducing infection (Wick et al., 2008). The timing of surgical prophylaxis and the appropriate use of antimicrobial prophylaxis is an agreed quality indicator and represents a significant intervention in preventing SSIs (Humphreys and Cunney, 2008). An array of studies reported significant drop in the rates of SSIs associated with increased awareness among healthcare workers (Joyce and Nanjiah, 2009; Eskander et al., 2013). On the other hand, lack of infection prevention and control awareness was found to be associated with poor practices of standard precautions by surgical wards nurses (Mahmud and AbdulSahib, 2011).

Empirically establishing the level of knowledge, attitude and actual practices of SSIs prevention among nurses is therefore an important issue for inquiry. The present study aimed to investigate knowledge, attitude and SSIs prevention practices among nurses in north-central, Nigeria.

MATERIALS AND METHODS

Descriptive survey research design of the correlational type was adopted for this study. The population comprised nurses working at the surgical wards and operating theatres of the University of Ilorin Teaching Hospital Ilorin, Nigeria. A convenience sampling was used to select 250 nurses who were free and willing to participate in the study. Data was collected using a questionnaire with reliability of 0.88 estimated on the Cronbach alpha scale. Participants' knowledge was assessed by 10 question, 2 points were awarded for each correct answer; zero point for incorrect answer while no idea attracted zero point as well. Attitude was assessed using ten questions with the statement constructed along a 4-point scale (strongly disagree to strongly agree). Since the items were negatively worded, strongly disagree attracted 4 points while

*Corresponding author. E-mail: atijani.nur@buk.edu.ng. Tel: +2348184438100.

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strongly agree attracted 1 point with agree and disagree taking 2 and 3 points respectively. In the same vein, practice was assessed using a ten item scale on a 4-point scale (very often to never). Two research assistants collected the data using on the spot administration technique. Respondents were requested to read and fill a consent form before given copies of the questionnaire which were filled and collected on the spot. The essence of this administration technique was to avoid the loss of questionnaire. Filled copies of the questionnaires were scrutinized for complete filling and coded into SPSS. The coded data were analysed using descriptive statistics of frequency and percentages and inferential statistics of Pearson product moment correlation coefficient at 0.05 alpha level.

RESULTS

The ages of the respondents ranged from 25 to 51 mean 36 ± 3.7 and 168 (70.6%) were female with Nursing Officer I forming majority (36.1%). The rest respondents were Nursing Officer II (30.3%), Senior Nursing Officer (14.3%), Principal Nursing Officer (13.4%) and Chief Nursing Officer 5.9%. The years of experience of the nurses ranged from 1 to 20 with a mean of 14 ± 3.2 years.

On the knowledge of respondents on prevention of SSIs, 68.1% of the respondents correctly identified contaminated personnel hands as major sources of SSIs in the hospitals, 97.9% also correctly identified the need to wash hands or sanitize the hands after handling soiled linen. On the place of jewelries preventing proper hand washing, only 40.3% of the respondents demonstrated this knowledge with 22.7% having no idea. Findings also showed that 55% of the respondents reported that shaving before surgery reduces the chance of surgical site infections, 25.6% reported that they do not have an idea. More so, 46.6% reported that antimicrobial soap use before operation could reduce SSIs. Again, 45.8% of the respondents also reported that risk of SSIs after shaving is lowest when done shortly before the operation with a higher percentage, 62.2% reporting that application of antibiotic cream to the entry site reduces the risk of infections. Good knowledge of SSIs prevention was demonstrated by 92.4% response that washing hands or sanitizing before simple surgery or caring of surgical wound is important to preventing SSIs. In the same vein, 86.1% of the respondent also reported the need to wash hands before commencing work at the surgery ward.

Respondents' views on prevention of SSIs are represented in Table 1. The results further showed a relatively high practice of surgical wound prevention guidelines as only 15.1% of the respondents reported not washing their visibly soiled hands sometimes. Findings also showed that 71.4% reported using sterile technique to change dressing often, although 28.6% reported this practice just sometimes. It was also revealed that nearly half of the respondents (45%) reported that they sometimes change damp sterile dressing as often as possible. Also, only 16% reported complying with surgical wound guidelines very often with 34% reporting complying

with these guidelines often. Again, only 22.3 and 27.3% reported using hand gloves and other protective devices very often and often respectively while 34.9% reported washing their hands before and after caring for a surgical wound very often. Generally, being safety conscious while discharging care for surgical wounds was reported to be practiced very often by only 17.6% of the respondents although 30.7% reported being safety conscious often with 6.3% reporting being indifferent.

The result of the study as shown in Table 2 above revealed that there is positive associations between all the variables studied. Findings showed that there is positive and moderate correlation between knowledge and attitude towards SSIs prevention with an r value of 0.695 and the p value at $0.000 < 0.001$ showed that this association is significant. Similarly, there is also positive and moderate correlation between knowledge and practice at an r value of 0.570 and p value at $0.000 < 0.01$. When association between attitude and practice was tested, findings showed that there is a high level of correlation between the two variables at an r value of 0.763 and p value at $0.000 < 0.01$.

DISCUSSION

The result of the study demonstrated that respondents reported a fairly high level of knowledge on prevention or SSIs. A major issue in prevention of deleterious health outcomes is translation of possessed knowledge into actions. This is especially the case with health care providers whose professional trainings expose them to a body of knowledge on critical health issues. The challenge is therefore the translation of this knowledge to needed actions aimed at preventing negative health outcomes like surgical site infections. Knowing what to do is one thing and actually doing what one knows to do is an entirely different thing. It is equally important to ensure that possessed knowledge is potent enough to stimulate needed attitude to help maximize the possibility of translating what is known into desirable actions. Taking the issue of hand washing as an example, over 68% of the respondents reported knowledge of infection transmission in the hospital through professionals or care providers unwashed hands. But when attitude towards hand washing was investigated in the second research question items only 31.9% demonstrated strong positive attitude towards frequent and correct hand washing. When taking down to actual practice, findings showed that only 8.8% of the respondents reported washing their hands as soon as they report for duties at the ward frequently. This goes down to confirm the assertion that knowledge does not necessarily translates into action. It is however important to state that the findings of the study corroborate earlier findings by Famakinwa et al. (2014) that equally reported relatively high level of knowledge on SSIs prevention among nurses in Obafemi Awolowo Teaching Hospital, Ile-Ife, Nigeria. The result of

Table 1. Attitude towards SSIs prevention.

Items	Strongly agree	Agree	Disagree	Strongly disagree
There is no proof of the importance of the guideline for care of surgical wounds	36 (15.1%)	110 (46.2%)	54 (22.7%)	38 (16.0%)
Guidelines for care of surgical wounds make my work harder	60 (25.2%)	102 (42.9%)	76 (31.9%)	-
Following the guidelines for care of surgical wounds takes too much time	54 (22.7%)	127 (53.4%)	36 (15.1%)	21 (8.8%)
I do not care about guidelines for care of surgical wounds since they are not very necessary	21 (8.8%)	147 (61.8%)	49 (20.6%)	21 (8.8%)
Guideline for surgical wounds makes patient care very cumbersome	80 (33.6%)	101 (42.4%)	45 (18.9%)	12 (5.0%)
We do not have enough sterile dressings so this affect compliance with guideline for surgical wounds care	15 (6.3%)	65 (27.3%)	116 (48.7%)	42 (17.6%)
Since some nurses do not follow the guidelines for surgical wound care, I feel it is not important for me to follow them	36 (15.1%)	63 (26.5%)	98 (41.2%)	41 (17.2%)
Washing of the hands before and after taking care of a surgical wound is stressful	39 (16.4%)	90 (37.8%)	92 (38.7%)	17 (7.1%)
Frequent changing of damp sterile dressing brings undue stress	36 (15.1%)	98 (41.2%)	45 (18.9%)	59 (24.8%)
Using sterile technique while changing incision wound increases nurse stress	33 (13.9%)	54 (22.7%)	98 (41.2%)	53 (22.3%)

Table 2. Associations between knowledge, attitude and SSIs prevention practices.

Practice	Knowledge	Attitude	Practice
Knowledge	Pearson correlation	1	0.695(**)
	Sig. (2-tailed)		0.000
Attitude	Pearson correlation	0.695(**)	1
	Sig. (2-tailed)	0.000	0.000
Practice	Pearson correlation	0.570(**)	0.763(**)
	Sig. (2-tailed)	0.000	0.000

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

the study also showed relatively poor attitude towards SSIs prevention and this is suspected to affect practice. As earlier stated, knowledge does not translate into positive attitude. Although knowledge is important in shaping right attitude, it is however not certain that knowledge gained will translate into positive attitude. Many barriers and extraneous factors might come into play to whittle down the potency of acquired knowledge in

bringing about desired attitude. Since attitude is much more likely to influence behavior than just knowledge, emphasis aimed at bringing about improved SSIs prevention practices might be targeted at helping nurses develop positive attitude towards SSIs prevention. Nurses with poor attitude towards SSIs prevention will be more likely to engage in SSIs prevention practices as equally confirmed by this study that showed a positive

and high correlation between attitude and SSIs prevention practices. An important way of improving SSIs prevention practices could therefore be targeted at improving on the attitude of nurses towards the prevention guidelines as this improvement will result in improvement in SSIs prevention practices. This study confirms the findings of Brisibe et al. (2014) that reported similar results among health care providers

working in selected tertiary health institutions in Port Harcourt, Nigeria. On the issue of actual practice of SSIs prevention guidelines, results showed worrisome percentage of respondents who demonstrated lackadaisical attitude and indifference towards the practice of these guidelines. The results showed that a poor percentage of the respondents reported carrying out critical steps in preventing SSIs only sometimes when these practices should be done almost always. This finding corroborates the work of Brisibe et al. (2014) who also reported unsatisfactory level of SSIs prevention practices among health workers in two tertiary health institutions in Port Harcourt Nigeria. Factors relating to shortage of supplies in consumables, lack of in-service training and poor monitoring and supervision were highlighted as causes of unsatisfactory practice of SSIs prevention guidelines

Based on the findings of the study, it is concluded that though nurses working in the surgical wards of the teaching hospital investigated demonstrated evidence of good knowledge of SSIs prevention, the level of knowledge did not translate into desired attitude and practices on SSIs prevention. The results of the study also showed that there is positive, moderate and significant association between knowledge and attitude towards SSIs prevention just as the same relationship exists between knowledge and SSIs prevention practices. Again there is high, positive and significant association between attitude and practice of SSIs prevention. It was therefore recommended that there is need for on the job training for nurses to help re-awaken them to the roles expected of them in protecting and preserving life. Also, there is need for close monitoring and supervision of surgical ward nurses to ensure that they strictly adhere to SSIs prevention guidelines. The authorities of hospitals too should provide on regular basis the necessary consumables and supplies to ensure strict adherence to SSIs prevention guidelines. In the same way, the use of education, information and communication materials need to be conspicuously displaced in and around the ward to help keep nurses on their toes on infection prevention. Lastly, there is need for patients' education and empowerment on their rights and the responsibilities and obligations care providers owe them. This is important to enable them realize when their rights are being trampled upon and their safety threatened by the negligence of care providers.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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