International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Impact Factor (2012): 3.358

Prevention of Post-Operative Wound Infection in Accordance with Evidence Based Practice

Archana Maurya[1], Seema Mendhe[2]

[1]Professor & Head Dept of child Health Nursing SRMM College of nursing, DMIMS (DU), Maharashtra, India

[2]AVBR Hospital, Sawangi Meghe, Wardha Maharashtra India

Abstract: ***Prevention of post operative infection in accordance with evidence based practice. Aim: To assess the existing practices, develop evidence based norms, effect & hidden for implementation of evidence based practice for prevention of post operative wound infection. Method:- This study include staff nurses (n=10 vs. n=15) and facilitators (n=3) from the female surgery ward. Data about nurses' attitude, knowledge and practically skill were collected before and after implementing of new routines. Finding: Overall improvement of knowledge regarding on post operative wound care of nurses 93%. And for attitude in pre-test/baseline 78.13% nurses and 97.6% nurses answered the post test. The skill of doing procedure systematically in the pre test shows was only 58.57% but in post-test shows improvement that is 100% therefore there was significant improvement in developing evidence based skill of doing procedure.***

Keywords: Evidence-based practice, wound care, prevention, nurse facilitator, teacher facilitator

1. Introduction

Dressings are part of a holistic wound management plan with individualized patient goals. One goal may be to facilitate faster wound healing by providing the optimal environment for healing to proceed. Postoperative surgical site infections (SSIs) remain a major source of illness in surgical patients. These infections number approximately 500,000 per year, among an estimated 27 million surgical procedures, and account for approximately one quarter of the estimated 2 million nosocomial infections each year. They are associated with significant morbidity, and frequently lead to increased length of hospital stay, pain and discomfort for the patient, and in some cases even permanent disability[1].

The more than 30 million surgeries performed in the United States each year, surgical site infections (SSIs) are associated with approximately 500,000 procedures. The average SSI adds 7 to 10 days on to the length of the hospital stay and attributable costs for just one case can range from $12,488 to $36,462. Patients with SSIs experience a longer time to recovery, more pain, and a higher likelihood of developing additional complications compared to patients who do not acquire an infection. Moreover, the risk of death for those affected by SSIs is 2 to 11 times greater than non-infected surgery patients.

Most infections are caused by endogenous factors, such as pathogens that inhabit the patient's skin. Staphylococcus aureus is the most frequently found microorganism on the skin and the most common isolate associated with the development of SSIs. Exogenous sources of microorganisms that contribute to SSIs include transient flora from the surgical team members' hands, fingernails, forearms, and jewellery that are transferred to patients. Likewise, instruments, tools, and other materials used in the operating room may be contaminated with bacteria if not properly sterilized

Considering the high rate of morbidity and mortality associated with SSIs, infection prevention is a top priority necessary to improve patient safety. While not all bacterial infections can be prevented, research suggests a significant number can be avoided by the use of assiduous evidence-based infection control measures. Thus, a number of prevention strategies are recommended by the Centres for Disease Control and Prevention (CDC) and the Healthcare Infection Control Practices Advisory Committee (HICPAC) to reduce surgical site morbidity.

2. Need for the Study

Surgical site infection is a type of healthcare-associated infection in which a wound infection occurs after an invasive (surgical) procedure. Other types of healthcare-associated infections that mainly affect surgical patients are postoperative respiratory and urinary tract infections, bacteraemias (including methicillin-resistant *Staphylococcus aureus* infections and intravascular cannula infections) and antibiotic-related diarrhoeas (particularly *Clostridium difficile* enteritis). Surgical site infections have been shown to compose up to 20% of all of healthcare-associated infections. At least 5% of patients undergoing a surgical procedure develop a surgical site infection.

A surgical site infection may range from a spontaneously limited wound discharge within 7–10 days of an operation to a life-threatening postoperative complication, such as a sternal infection after open heart surgery. Most surgical site infections are caused by contamination of an incision with microorganisms from the patient's own body during surgery. Infection caused by microorganisms from an outside source following surgery is less common. The majority of surgical site infections are preventable. Measures can be taken in the pre-, intra- and postoperative phases of care to reduce risk of infection.

Surgical site infections can have a significant effect on quality of life for the patient. They are associated with

Licensed Under Creative Commons Attribution CC BY

considerable morbidity and extended hospital stay. In addition, surgical site infections result in a considerable financial burden to healthcare providers. Advances in surgery and anaesthesia have resulted in patients who are at greater risk of surgical site infections being considered for surgery. In addition, increased numbers of infections are now being seen in primary care because patients are allowed home earlier following day case and fast-track surgery.

Prevention of surgical site infection (SSI) is an important issue in both high and low income countries. Printed material and references for infection prevention are available to affluent health care facilities, but considerably less exists for settings with limited resources. It is difficult for practitioners in such settings to prioritize choices of activities and materials.

A lack of evidence to guide optimum postoperative wound care promotes a wide range of management techniques. Hence, this initiative included the standardization of wound care management, utilizing best practice findings, with a goal of 100% compliance. The hospital epidemiologist provided research data that supported the use of chlorhexidine gluconate soap to cleanse sternal wounds. The surgeons performing the majority of cases collaborated with nursing staff to identify elements of the sternal wound care protocol. Identifies key elements of this protocol. In addition, as part of the wound care educational initiative, all nursing staff completed a learning module on aseptic wound care principles and technique. Objectives focused on patient risk factors, exogenous and endogenous sources of infection, and standard guidelines to reduce the spread of infection. Principles relating to aseptic technique were emphasized and participants completed a post test following the education. In an effort to standardize wound care among physicians, the postoperative order set was revised to integrate consistent dressing change expectations. Engaged bedside ICU nurses, providing peer recommendations for improved practice and adherence to standards, completed monthly real-time chart audits and identified wound care discrepancies among providers. Currently, the ICU and telemetry units have a 98% compliance rate to the wound care standard (n = 58)[2].

The majority of the research literature that relates to wound care focuses on assessment of the wound and treatment options. While this literature offers indispensable information and practical tools for providing good evidence-based care, research literature on the topic of the nurse's experience of dealing with wounds is scarce. In general, the focus of experiential research has been on the patient and their family's response to a health issue or life experience (such as diagnosis of cancer, birth or living with a chronic illness). Nurses themselves have been reluctant to explore the meaning of 'mundane' aspects of care (Lawler, 1991) despite the importance given to these often repetitive and 'basic' tasks (Lomborg and Kirkevold, 2005; Doran et al, 2006).

The goals of wound dressing products are to provide a moist wound bed, protect the open wound bed from trauma or potentially harmful agents, manage drainage/exudate and manage infection. Knowledge of wound care products and their appropriate use, as well as the phases of wound healing and use of products on wounds healing by secondary intention, is crucial. "The skills, knowledge and attitudes of health-care professionals can have a major impact on their ability to assess the complexity of a wound, control a patient's symptoms and manage associated problems."

3. Literature Review

According to Shinde M (2007) Review of literature is important for having a broad understanding of the problem. "The material gathered in literature review should be an integral part of research data. Since what is found in the literature does not only have the influence which is important for formulating the problem and design of research, but also provides useful comparative material, when the data collected in the research is analyzed." A review of related literature gives an insight into the various aspects of the problems under study. The review serves as an integrated function that facilitates the accumulation of knowledge. Hence, review of literature is important to a research in order to know what has been established and documented [3].

The nursing management of people with blood borne diseases involves the risk of occupational hazards to health care workers. As student health care workers become more involved in patient contact during their training, they are at risk of exposure to blood borne pathogens. The safety of student health care workers themselves, and subsequently that of their patients, depends directly upon the degree to which student nurses have knowledge of occupational hazards specific to their jobs and management mechanism for mitigating those hazards. The level of occupational safety and health training resource available to student nurses, as well as management support, are critical factors in preventing adverse out comes from routine job- related hazards[4]. In study highlights the urgent need for introducing measures in order to increase the knowledge, attitudes, practices Teaching Hospital, which may play a very important role in increasing hand hygiene compliance among the staff and reducing cross transmission of infections among patients[5]. Dressings are part of a holistic wound management plan with individualized patient goals. One goal may be to facilitate faster wound healing by providing the optimal environment for healing to proceed. However, it is necessary to look at the whole patient, underlying disease processes and patient-entered concerns before looking at the wound itself [6].

Postoperative surgical site infections (SSIs) remain a major source of illness in surgical patients. These infections number approximately 500,000 per year, among an estimated 27 million surgical procedures, and account for approximately one quarter of the estimated 2 million nosocomial infections each year. They are associated with significant morbidity, and frequently lead to increased length of hospital stay, pain and discomfort for the patient, and in some cases even permanent disability[1].

Evidence-based nursing and ultimately practice with focus on wound care requires the highest level of evidence. Further elaboration from David Sackett (2000) defines evidence-

Licensed Under Creative Commons Attribution CC BY

based wound management as the integration of best research evidence with clinical expertise and patient values[7].

Evidence-based medicine and ultimately practice with focus on wound care requires the highest level of evidence. Further elaboration from David Sackett (2000) defines evidence-based wound management as the integration of best research evidence with clinical expertise and patient values. Wound bed preparation extends the existing practice of using a holistic approach to evaluate and remove all barriers to healing, so that wound repair can progress normally. The overall goal of management is to achieve a stable wound that has healthy granulation tissue and one that is characterized by a well-vascularised wound bed. This would involve the removal of factors that delay healing [8].

The investigators followed the subjects for 30 days after surgery to identify the incidence of any SSI. Results revealed a significant 41% reduction in overall SSI rate in those who were prepped with chlorhexidine-alcohol versus individuals who received povidone-iodine prep (9.5% vs 16.1%; P=0.004, respectively). Chlorhexidine–alcohol was also significantly more effective than povidone–iodine in preventing both superficial incisional infections (4.2% vs 8.6%, P=0.008) and deep incisional infections (1% vs 3%, P=0.05). However, there were no notable differences between the 2 cohorts in the rate of organ-space infections or sepsis due to SSI. Additionally, the occurrence of adverse events was similar in both groups [9].

In 2006, Fellows and Crestodina reported that the optimal cleansing agent for wound cleaning should be sterile, noncytotoxic, and inexpensive. Because of the cost of sterile saline and reluctance of patients to discard unused solutions, Fellows and Crestodina conducted a small, quasi-experimental study in a home health setting to compare the bacterial content of home prepared saline made with distilled water and stored at room temperature (2 gallons) to saline stored in a refrigerator (2 gallons). Based on cultures of the solutions immediately following preparation and at weekly intervals for 4 weeks, the authors concluded that saline solution prepared by patients by adding table salt to distilled water (purchased from a grocery store) remained bacteria free for a month if refrigerated. The saline kept at room temperature had undesirable levels of bacteria after 2 weeks. The authors recommended further studies to confirm their findings [10].

Lawson, Juliano, and Ratliff in a non-experimental, longitudinal study monitored infection rates and supply costs of all patients with open surgical wounds healing by secondary intention before and 3 months after implementing non-sterile wound care. There was no statistically significant difference in infection rates. Dressing costs and time to perform the wound care were reduced using non-sterile dressing techniques (i.e., staff did not use sterile gloves, scissors, or bowls) [11].

In 1997, Stotts and colleagues compared the healing rates and costs of sterile vs. clean technique in post-operative patients (N = 30) who had wounds healing by secondary intentions following gastrointestinal surgery. The authors reported there was no statistically significant difference in the rate of wound healing between the two groups ($p < 0.55$). The cost however was significantly higher with sterile technique ($p < .05$) compared with clean technique[13]. An integrative literature review of seven published studies of clean and sterile technique for dressings revealed that while there is a lack of consensus about the benefit of clean versus sterile technique to improve healing or infection rates, clean technique results in lower costs [12].

There is a paucity of research about clean vs. sterile technique for wound care and studies have varied greatly in their design and findings. Angeras, Brandberg, Falk, and Seeman compared the use of sterile saline or tap water for cleaning acute traumatic soft tissue wounds and found that the infection rate in the tap water group was 5.4% compared to 10.3% in the group using sterile saline ($p < .05$) with a 50% decrease in costs for the tap water group[13].

Two studies examined the strike through contamination in saturated sterile dressings. Alexander, Gannage, Nichols, and Gaskins reported that when gauze sponges were saturated directly in their wrapper, that contamination occurred in 100% of sponges in uncoated wrappers. In the coated wrapped sponges, 80% exposed to Staphylococcus epidermidis and 20% exposed to Escherichia coli had strike through. In another study, cultures were taken from gauze sponges that were saturated directly on their wrappers on hospital over-bed tables of postoperative surgical patients. The saturated gauze showed significant growth of microorganisms. The authors reported there was no significant difference in strike-through contamination in gauze saturated on coated or uncoated wrappers. Investigators in both these studies concluded that the practice of saturating gauze sponges on their wrappers was unacceptable [14].
Post-operative surgical teams that provide wound care and dressing changes for patients should receive education and support in order to provide care that reflects best practices. Education for surgical staff should include the use of aseptic non-touch technique for changing or removing surgical wound dressings. Sterile saline is recommended for wound cleansing48 hours after surgery, and showering is permitted 48hours after surgery [15].

In Australia, a quality improvement initiative established a team consisting of the clinical services director, an orthopaedic surgeon, an infection control nurse, the operating suite and surgical unit nurse managers, a general surgeon and a university professor With team effort and the education of staff and patients, they were able to reduce post-operative infection rates[16].

4. Problem Definition

Prevention of post operative wound infection in accordance with evidence based practice.

a) **Aim:**
To assess the existing practices, develop evidence based norms, effect & hidden for implementation of evidence based practice for prevention of post operative wound infection.

Licensed Under Creative Commons Attribution CC BY

b)Methodology:

Methods: This study include staff nurses (n=10 vs. n=15) and facilitators (n=3) from the female surgery ward. Teacher facilitator trained nurse facilitators about new routine and nurse facilitators; they imparted training to fellow nurses about new routine. Data about nurses' attitude, knowledge and practically skill were collected before and after implementing of new routines.

Material: These tools were used for data collection for evidence based practice.

1. Questionners about Prevention of postoperative wound infection for assess the knowledge of staff nurses.
2. Checklist of post operative wound dressing for check psychomotor skill of staff nurses.
3. Assess the attitude of staff nurses through Attitude scale about for Prevention of postoperative wound infection.

5. Setting of the Study

This study is conducted in AVBR Hospital Sawangi Wardha (M.S.) India. Total Staff Nurses from the surgery ward involve in this study.

- **Research Approach**-Experimental approach
- **Research method**- Qualitative methods
- **Setting of study**- Female Surgery Ward AVBR hospital Sawangi Wardha (M.S.) India.
- **Population**- Sister Incharge & Staff nurses
- **Sample**- Staff nurses
- **Sample size**- n=15 staff nurses

6. Result and discussion

Overall improvement of knowledge regarding on post operative wound care of nurses 93%. And for attitude in pre-test/baseline 78.13% nurses and 97.6% nurses answered the post test scale.

The presences difference is statistically not significant but the participants' nusres took keen interest and effort to update their knowledge on evidence based practise.

The skill of doing procedure systematically in the pre test shows was only 58.57% but in post-test shows improvement that is 100% therefore there was significant improvement in developing evidence based skill of doing procedure.

Feedback reports of the patients' shows that 100% satisfaction regarding care given by nurses. Through the evidence based practice the researcher was collected the evidences of existing practices than prepared the plan on the bases of existing practices than trained the staff nurses about post operative wound care and when they adopt the ideal care in practice taken post test after that researcher analysing the test. The tremendous change came in study its proof the through evidence based practice the skill on wound dressing are more effective.

7. Conclusion

This study reveals that post operative wound care in female surgery ward based on evidence based practice had positive outcome for the patient's satisfaction and for nurses as a new routine for the better patient care. This practice can be implemented in other patient's problem.

The research project demonstrates one hospital's successful use of a clinical process improvement project utilizing a multidisciplinary approach to implement evidence-based practice. Effective change requires strategic planning with all disciplines involved, which promotes ownership of outcomes and sustainability of new practice expectations. Putting these practices in place would provide more comprehensive accountability and address patient needs across the entire continuum of care.

Wound dressing is a complex and dynamic process that is influenced significantly by the changing health status, lifestyle choices and available resources of the individual who is living with the condition. Wound management by Health Care Professionals (HCP) is provided through the adoption of an evidence informed framework that considers the whole client. Through the process of education and knowledge transfer health care professionals can develop the necessary knowledge and skills required to provide best practice informed care for a person with a wound.

Nurses play a critical role in identifying, orchestrating, and evaluating change efforts in clinical practice. With their proximity to the patient, nurses are key drivers of patient-centered change. This exemplar attests to the practicalities and possibilities for nurses to spearhead efforts to enhance postoperative recovery and reduce the risk of premature mortality.

8. Future Scope

- **Nursing Services**
  It can be used as a guide for can serve as reinforcement for psychomotor skill on the bases of evidence based practice in clinical area for other post operative problems.
- **Nursing Education**
  Evidence based practice will help students, colleagues, and junior staff to be trained in using current practice related to other aspect of post operative care.
- **Nursing Administration**
  Findings of the study can be used by the Nursing Administrators in creating policies and plans for wound dressing.
- **Nursing Research**
  Other researchers may utilize the suggestions and recommendations for conducting further study.

Reference

[1] International journal infection control 2008, 4:1 doi:10.3396/ijic.V4i1.007.08 Page of 4
[2] Furnary AP, Zerr KJ, Grunkemeier GL, Starr A. Continuous intravenous insulin infusion reduces the incidence of deep sternal wound infection in diabetic patients after cardiac surgical procedures. *Ann Thorac Surg*. 1999;67:352-362.

Licensed Under Creative Commons Attribution CC BY

[3] SHINDE, M., & ANJUM, S. (2007). Introduction to Research In Nursing. Sneha Publication India, (Dombivili).
[4] Kale, M., Gholap, M., & Shinde, M. (2014). Knowledge and Practices of Universal Precautions among Basic B. Sc. Nursing Students. *International Journal of Science and Research (IJSR)*, *3*(6), 1862-1870.
[5] Shinde, M., & Mohite, V. R. (2014). A Study to Assess Knowledge, Attitude and Practices of Five Moments of Hand Hygiene among Nursing Staff and Students at a Tertiary Care Hospital at Karad. *International Journal of Science and Research (IJSR)*, *3*(2), 311-321.
[6] Sibbald, R.G., et al., Preparing the wound bed 2003: Focus on infection and inflammation. Ostomy/Wound Management 2003, Vol. 49 (11): 24-51.
[7] Sackett, D.L., The fall of ”clinical research” and the rise of ”clinical-practice research”. Clinical and Investigative Medicine 2000, Vol. 23(6): 379-381. Erratum in: Clinical and Investigative Medicine 2001, Vol. 24 (1): 4.
[8] Enoch, S. and Harding, K., Wound Bed Preparation: The science behind the removal of barriers to healing. Wounds: A Compendium of Clinical Research and Practice 2003, Vol. 15 (7): 213-229.
[9] Bleasdale SC, Trick WE, Gonzalez IM, et al. Effectiveness of chlorhexidine bathing to reduce catheter-associated bloodstream infections in medical intensive care unit patients. *Arch Intern Med.* 2007; 167(19):2073-9.
[10] Fellows J, Crestodina L. Home-prepared saline. J Wound, Ostomy Contin Nurs. 2006;33:606-609.
[11] Lawson C, Juliano L, Ratliff C. Does sterile or nonsterile technique make a difference in wounds healing by secondary intention? Ostomy Wound Manag. 2003;49:56-60.
[12] Ferreira AM, de Andrade D. Integrative review of the clean and sterile technique, agreement and disagreement in the execution of dressing. Acta Palulista de Enfermagem. 2008;21:117-121.
[13] Angeras MH, Brandberg A, Falk A, Seeman T. Comparison between sterile saline and tap water for the cleaning of acute traumatic soft tissue wounds. Eur J Surg. 1992;58:347-350.
[14] Popovich DM, Alexander D, Rittman M, Mantorella C, Jackson L. Strike-through contamination in saturated sterile dressings: a clinical analysis. Clin Nurs Res. 1995;4:195-207
[15] Dr John Hyslop, Dr Ash Paul, Liam Smeeth Professor of Clinical NICE Surgical site infection Prevention and treatment of surgical site infection Issue date: October 2008.
[16] Barton, P., Parslow, N. Malignant wounds; Holistic assessment and management in: Krasner, D.L., Rodenheaver G.T., Sibbald, R.G., eds. Chronic Wound Care: A Clinical Source Book for Healthcare Professionals, 3rd ed. Wayne, PA: HMP Communications 2001: pg 700

Author Profile



Archana Maurya is working as Professor and Head of Department of child health nursing, SRMM College of nursing, DMIMS (DU), Maharashtra, India

Seema Mendhe is Staff nurse in SRMM College of nursing, DMIMS (DU), Maharashtra, India

Licensed Under Creative Commons Attribution CC BY