

Patient Centered Care to Reduce Surgical Site Infection in Geriatric Patients : A Scoping Review Protocol

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Abstract - Objective: The objectives of this scoping review are to analysis of Patient Centered Care (PCC) implementation on Surgical Site Infection (SSI) reduction in geriatric patients. The results of this scoping review are expected to provide information related to the implementation of PCC to reduce the incidence of SSI in geriatric patients. **Introduction:** There are at least 234 million operations every year, with the frequency of occurrence of SSI reaching more than 20% in the world. During the last decade, the incidence of SSI has increased very rapidly each year, about 500,000 patients experiencing SSI. Age has been confirmed as a risk factor for SSI after surgery. Currently the geriatric population is increasing rapidly throughout the world. The advancement of health care is an important factor in efforts to prolong life. This phenomenon in turn becomes a challenge for the health service system. Health workers who are in charge of caring for patients required to provide good health services. Currently PCC is emerging as the main approach in patient care. **Inclusion criteria:** The review will include published papers that discuss changes in the incidence of SSI in geriatrics by applying PCC. **Methods:** Search will be carried out to identify literature published between 2012 and 2021. The databases that will be used to search for related journals are: PubMed, Scopus, and EBSCO. The PRISMA protocol will be used in this study. Literature is selected in accordance with the inclusion criteria and then will be critical appraisal and analyzed. **Result:** From several studies it was found that there was a decrease in the Surgical Site Infection rate in the intervention group that applied a multidisciplinary team approach or used bundle care in the implementation of Patient Centered Care. The application of PCC is even more significant to reduce SSI in patients who have higher ASA (The American Society of Anesthesiologists) levels, including patients with old age. **Conclusion:** Geriatric population has unique physiological and social demands. Collaborative care models lead to better outcomes and care for patients and also offer cost savings in healthcare systems.

Index Terms - Patient centered care, surgical site infection, geriatric patients

INTRODUCTION

There are at least 234 million operations every year, with the frequency of occurrence of SSI reaching more than 20% in the world. During the last decade, the incidence of SSI has increased very rapidly each year, about 500,000 patients experiencing SSI (Weiser et al., 2008).

SSI is associated with increased morbidity and mortality, the occurrence of repeat operations, rehabilitation and prolonged antibiotic therapy, and is also associated with loss of individual productivity (Curcio et al., 2019).

Patients with SSI require a longer hospital stay, require longer wound care, and may require costs for further surgeries and repeated treatments at the hospital. The combination of additional costs due to the service required is very high. SSI is the type of HAIs that costs the most with an estimated annual cost of up to 3.3 billion dollars ("9 Surgical Site Infection (SSI) Event," 2020). SSI has a negative impact both physically and psychologically on patients, increasing morbidity, mortality, and also patient income while

undergoing treatment in the hospital. Stress due to SSI experienced by patients and their families is associated with longer treatment periods, so that patients cannot work, thereby reducing the quality of life of patients (Badia et al., 2017; Urban, 2006).

A survey conducted by the Centers for Disease Control and Prevention (CDC) estimated that 110,800 SSI incidents were associated with surgical inpatients in 2015 (“9 Surgical Site Infection (SSI) Event,” 2020). The World Health Organization (WHO) reports that SSI is found in many developing countries with an incidence rate of 11.8 incidents out of 100 surgical procedures. However, as many as 66% of developing countries do not have clear data available regarding SSI (Berríos-Torres et al., 2017).

There are several factors associated with SSI, one of which is aging (Afenigus, n.d.). Age has been confirmed as an independent risk factor for SSI after surgery (Liu et al., 2019). The difference in healing outcomes in children and geriatrics is also not in doubt. This is caused by biological-anatomical factors. The water content, collagen, other connecting proteins and the fat content of the skin change with age (Franzese et al., 2020). Currently the geriatric population is increasing rapidly throughout the world. The advancement of health care is an important factor in efforts to prolong life. This phenomenon in turn becomes a challenge for the health service system (Ren et al., 2019).

The high incidence of SSI in postoperative patients makes health workers in charge of caring for patients required to provide good health services (Curcio et al., 2019). Currently, Patient Centered Care (PCC) is emerging as the main approach in patient care. This approach emphasizes the partnership between the patient and healthcare professionals. PCC is an important part in forming a superior health service system. In addition, PCC is also important to increase cooperation between health service providers (Jo Delaney, 2018). PCC actively involves patients in decision making. The occurrence of system changes can improve service outcomes and also increase patient satisfaction with health workers. PCC also provides benefits for patients, patients can take good care of themselves when they are well educated. In addition, the PCC approach significantly reduces the need for patients to see specialist doctors and reduces the length of stay at the hospital (Jo Delaney, 2018).

However, the complexity of the PCC concept has difficult implications for the implementation of PCC (McCance et al., N.d.). Meanwhile, there is little information regarding the PCC regarding the SSI incident, so there is still little clear guidance in its application.

The results of this scoping review are expected to provide information related to the implementation of Patient Centered Care (PCC) to reduce the incidence of Surgical Site Infection (SSI) in geriatric patients to hospitals, educational institutions and the community. Based on this information, the hospital can create a strategy to start implementing PCC in the service system, and can develop a strategy to overcome the obstacles that arise in the implementation of PCC in the field. The community, especially patients, will get many benefits if this strategy can be implemented in the hospital. One of the advantages of successful PCC application is the reduced incidence of SSI in geriatric patients.

IDENTIFY, RESEARCH AND COLLECT IDEA

Review questions

Based on the background and objectives of the upcoming scoping review, the following review questions are formulated: how is the implementation of Patient Centered Care (I) to reduce the incidence of Surgical Site Infection (O) in geriatric patients (P)?

Inclusion criteria

Participants

This review will include studies that discuss changes in the incidence of Surgical Site Infection in geriatric patients aged ≥ 65 years who performs the surgical procedure.

Concept

The studies will be selected if it is a paper that applies Patient Centered Care. Patient centered care (PCC) is a concept and standardization of health care systems. Today, PCC is a popular approach in many health care systems. PCC is a health service standard that ensures patients become the center of the health service itself (McCance et al., n.d.; Natan, n.d.).

Context

This review will include studies with a research area only in the hospital area, such as a public hospital, private hospital, teaching hospital or tertiary care hospital.

Types of sources

This scoping review will consider quantitative, qualitative, and mixed methods study designs for inclusion. This review will include studies that published between 2012 and 2021. Studies written in language other than English will be excluded. Papers that discuss Healthcare-Associated Infections (HAIs) will not be included unless the paper specifically mentions about Surgical Site Infection. Only research paper will be include in this study, opinion, letter to editor, etc will not be include in this study.

Methods

The proposed scoping review will be conducted in accordance with the JBI methodology for scoping reviews (Peters et al., 2017).

Search strategy

Search strategy will start with developing keywords. This will be done through discussions conducted by researchers and experts, focusing on incidents of Surgical Site Infection, Patient Centered Care and geriatric patients, to ensure the main points are adequately covered in the literature search. Boolean operators (ig AND, OR, and NOT) will be used to combine or exclude keywords in searches, resulting in more focused and relevant results. A list of keywords that will be used as the basis for a broader literature search will be detailed in Appendix I.

This review will include studies that published between 2016 and 2021. Studies written in language other than English will be excluded.

Information sources

Search will be carried out to identify literature published between 2012 and 2021 (the timeframe for the publication of research journals when PCC first introduced in Hospital). The databases that will be used to search for related journals are: PubMed, Scopus, and EBSCO.

Study selection

Following the search, all identified citations will be collated and uploaded into EndNote and duplicates removed. Following a pilot test, titles and abstracts will then be screened by two independent reviewers (YDI and NMS) for assessment against the inclusion criteria for the review. Potentially relevant sources will be retrieved in full and their citation details imported into the JBI System for the Unified Management, Assessment and Review of Information (JBI SUMARI) (JBI, Adelaide, Australia) (Peters et al., 2017). The full text of selected citations will be assessed in detail against the inclusion criteria by two independent reviewers (YDI and NMS). Reasons for exclusion of sources of evidence at full text that do not meet the inclusion criteria will be recorded and reported in the scoping review. Any disagreements that arise between the reviewers at each stage of the selection process will be resolved through discussion, or with an additional reviewer/s. The results of the search and the study inclusion process will be reported in full in the final scoping review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for scoping review (PRISMA-ScR) flow diagram (Moher et al., 2015).

Data extraction

Data will be extracted from papers included in the scoping review by two independent reviewers (YDI and NMS) using a data extraction tool developed by the reviewers (YDI and NMS). The data extracted will include specific details about the participants, concept, context, study methods and key findings relevant to the review question/s.

Data presentation

The literature selected according to the inclusion criteria will then be subjected to critical appraisal and analysis. Thematic analysis is used to analyze the literature that fits the inclusion criteria. Thematic analysis is a method of analysis that directs systematic insight into a pattern of meaning or theme. The collected literature will be categorized and summarized and then summarized systematically to answer the research problem (Snyder, 2019).

RESULTS

Based on the results of literature searches from 3 databases, 10 literatures were found that met the criteria. Publication dates between 2012 and 2021, 7 of which are studies from the USA, 1 study from the UK, 1 study from China and 1 study from Japan. All literature is published in English and full text is available.

In general, almost all literature states that there is a significant reduction in surgical site infections with the application of multidisciplinary patient care bundles.

A study conducted at a tertiary medical center involved a multidisciplinary team to form a bundle of care that would be implemented for patients undergoing surgery. This study revealed that there was a statistically significant reduction in the intervention group, namely fewer SSIs when compared to the pre-intervention group (pre-intervention group: 0.57%, intervention group 0.34%, with p value = 0.044). When compared between the intervention and non-intervention groups, a higher complication rate was found in the intervention group. This is due to the higher level of ASA in the intervention group. However, if analyzed more deeply, patients with ASA IV who complete at least 3 bundle elements have a 50% lower prevalence of complications in each category (Kelley et al., 2018).

In 2013, the Memorial Sloan Kettering Cancer Center (MSK), a comprehensive cancer center designated by the National Cancer Institute, developed a program to reduce the incidence of SSI. A multidisciplinary team gathers to review the patient's care from the preoperative period to the patient's discharge home. The intervention was carried out to test the bundle care which consisted of 13 components. The results of this study showed a decrease from 11.0% to 4.1% after the implementation of the bundle in high-risk patients including BMI 30kg/m², diabetes mellitus and a history of smoking. The largest reduction in SSI was in SSI with moderate risk (from 10.3% to 4.7% with p = 0.006) and high risk (from 19% to 2% with p < 0.001) (Weiser et al., 2018).

The study conducted at the Mayo clinic also involved a multidisciplinary team. This team plays a role in developing and evaluating bundle care which consists of 15 components, including preoperative, intraoperative, postoperative, and postoperative patient elements. The overall SSI rate during the preintervention period was 6.0%. After the adoption of the bundle, the overall SSI rate decreased to 1.1% (p = .01). Among ovarian cancers without bowel resection, the overall SSI rate fell from 4.8% to 1.0% for a relative risk reduction of 79.3% (p = .12). The overall SSI rate among ovarian cancer with bowel resection decreased from 10.6% to 2.4% for a relative risk reduction of 77.6% (p = .19). Among hysterectomies performed for uterine cancer, the overall SSI rate decreased from 5.1% to 0.0% (p = .23) (M. P. Johnson et al., 2016).

A study that reviewed the medical records of patients who underwent elective colon surgery for 2 years (January 2016 to December 2017), implemented bundle care in 2017. Patients were divided into two groups: preprotocol (PP: 2016) and postprotocol (PoP: 2016). year 2017). The results showed that PoP patients had significantly lower rates of superficial infection (odds ratio: 0.91 [0.74-0.98]; P = 0.045) and deep SSI (odds ratio: 0.97 [0.65] -0.99]; P = 0.048) than PP patients (Martinez et al., 2020).

This retrospective study of 637 patients who underwent surgery from January 2004 to June 2016, applied a multidisciplinary approach combined with the application of the antibiotic vancomycin to the wound site and surgical instruments. Patients were divided into 3 different surveillance groups: before surveillance and preoperative period were defined (January 2004–May 2007, n =152, control group); surveillance period 1, after implementation of surveillance and perioperative protocol (June 2007–July 2011, n =199, surveillance group 1); and surveillance period 2, following the implementation of surveillance, perioperative protocols and intrawound application of vancomycin (August 2011–June 2016, n =286, surveillance group 2). Patient characteristics were comparable between the 3 groups, with the exception of a higher mean age for surveillance group 2 compared to the control group. The rate of SSI was significantly lower in the surveillance group 2 (1.4%) compared to the control group (4.6%; P = 0.04). In the subgroup of patients who experienced superficial SSI, there were no differences between groups. While the distribution of deep SSI is as follows: 6 in the control group, 5 in the surveillance group 1 and 3 in the surveillance group 2 (Sono et al., 2018).

SSI surveillance at Guy's and St Thomas' NHS Foundation Trust (GSTT), a large acute healthcare organization in central London implements a locally developed bundle of care. This bundle consists of 3 parts: preoperative patient preparation, intraoperative implementation, postoperative wound care and patient support. The results of this surveillance are the overall rate of SSI in adult heart surgery decreased from 5.4% in 2009 to 1.2% in 2016 and the rate of Coronary Artery Bypass Graft (CABG) from 6.5% in 2009 to 1.7% in 2016, p <0.001 (Chiwera et al., 2018).

Another study conducted in the neurosurgery department at Haihe Hospital used a retrospective and prospective review. The care bundles created by the multidisciplinary team were applied to a prospective study that took place between 2008 and 2014 and were compared with results from a retrospective review. This retrospective review included 86 adult patients with an overall SSI rate of 10.5% (9 SSIs in 86 patients). Whereas in a prospective review, the SSI rate decreased to 1.8% (2 SSI in 113 patients). The difference was statistically significant (P = 0.01) (Liu et al., 2019).

There is a retrospective study conducted by collecting patient registers to evaluate the incidence of SSI in colorectal cancer cases at Samsung Medical Center, Korea. Patients who underwent colorectal surgery either laparoscopically or openly from March 2013 to December 2014 were included in this study. The multidisciplinary team developed a bundle of care consisting of 8 components, which are expected to reduce the risk of SSI. The results obtained from this study are SSI rates of 8.0% (12/150) during the 3 months before implementation, 3.3% (16/480) from April to December 2013, and 2.3% (14/607) in 2014 (Park et al., 2020).

Another retrospective study using data collected from surgeries performed at tertiary referral hospitals reported to Japanese Nosocomial Infections Surveillance (JANIS). Patients who were operated on from November 2010 to December 2015 will be included

in the study. Analysis was performed on 1,042 patients undergoing spinal surgery. There were 741 operations that occurred before implementation of bundle care (control group), and 301 operations after implementation occurred (intervention group). The result of this study was that the SSI rate decreased significantly from 3.8% to 0.7% ($p < 0.01$) after the intervention, with an overall relative risk reduction of 82% (Yamada et al., 2018).

Whereas in a prospective study conducted at the Memorial Sloan Kettering Cancer Center (MSK) involving all patients who underwent concurrent intestinal and liver resection from 1 January 2011 to 31 December 2016. The intervention, carried out on 1 November 2013, consisted of 13 perioperative components of a multidisciplinary bundle. This bundle was developed following a literature review and discussed with representatives from the departments of surgery, anesthesia, nursing, infection control, administration, and quality and safety. Overall superficial, deep, and organ SSI decreased by 60.5% ($p < 0.001$), 80.6% ($p < 0.001$), and 47.6% ($p = 0.008$), respectively. In the pre-intervention group ($n = 231$) there were 79 (34.2%), 31 (13.4%), and 48 (20.8%) superficial, deep, and organs, respectively. In the post-intervention group ($n = 193$) there were 26 (13.5%), 5 (2.6%), and 21 (10.9%) superficial, deep and organ respectively (Tufts et al., 2019).

CONCLUSION

From several studies it was found that there was a decrease in the Surgical Site Infection rate in the intervention group that applied a multidisciplinary team approach or used bundle care in the implementation of Patient Centered Care. The application of PCC is even more significant to reduce SSI in patients who have higher ASA (The American Society of Anesthesiologists) levels, including patients with old age. Geriatric population has unique physiological and social demands. Collaborative care models lead to better outcomes and care for patients and also offer cost savings in healthcare systems.

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