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Journal of Public Health Research and Community Health Development , well known as JPH RECODE, is a journal published by Public Health Study Program *Sekolah Ilmu Kesehatan Dan Ilmu Alam (SIKIA)* Universitas Airlangga. Our journal is published biannually in October and March.

JPH RECODE is on public health as discipline and practices related to preventive and promotion measures to enhance health of the public through scientific approach applying variety of technique. This focus includes area and scope such as biostatistics and health population, epidemiology, health education and promotion, health policy and administration, environmental health, public health nutrition, sexual and reproductive health, and occupational health and safety.

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JPH RECODE was first published since October 2017 (Volume 1 Issue 1) with 6 manuscripts in 60 pages, then from March 2018 until now our journal has been publishing 8 manuscripts in every edition. Every edition now consists of 65-75 pages. Manuscripts are written in full Indonesian (Bahasa Indonesia) or full English except on abstracts used both languanges are Indonesian and English.

The journal employs peer-review mechanism where each submited article should be anonimously reviewed by expert peers appointed by the editor. Articles published in this journal could be in the

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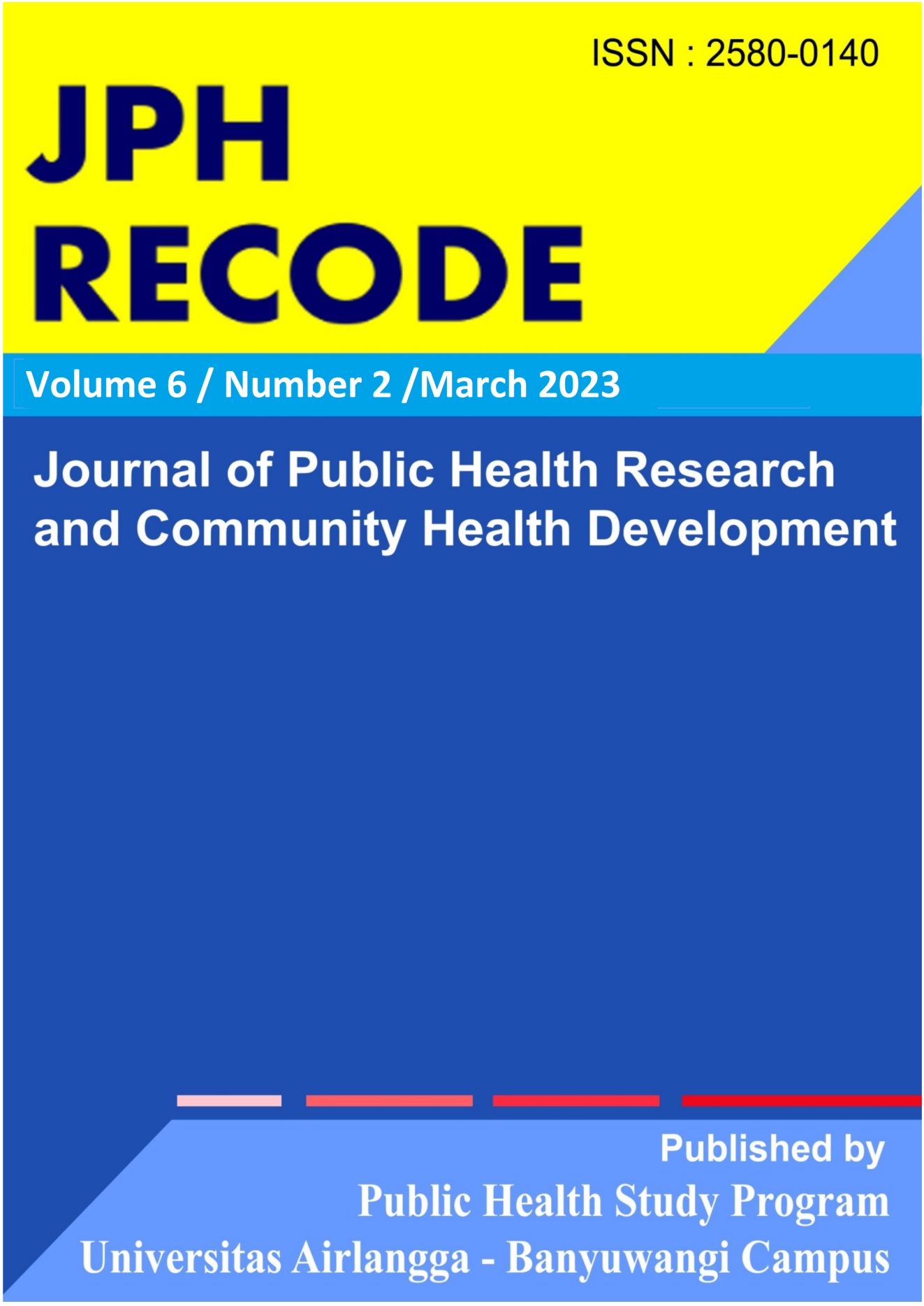
Current Issue



Vol. 6 No. 2 (2023): March

Volume 6 No 2 contains 4 research articles and 6 literature review in the area of public health. These articles were authored/co-authored by 26 authors from 12 institutions and 3 countries (Indonesia,

Malaysia, and Australia).

Published: 2023-03-01

Front Matter

FRONT MATTER

Abstract : 47
PDF : 42

PDF

Editorial

Achieving High Quality Publication from Indonesian Scientists

DOI : 10.20473/jphrecode.v6i2.44166
82
Abstract : 44
PDF : 18

PDF

Research Articles

CORRELATION BETWEEN OHS KNOWLEDGE, MOTIVATION, WORK STRESS, AND UNSAFE ACTION (STUDY ON PRODUCTION SECTION WORKERS AT PT MANDIRI JAVA FOOD SEMARANG, INDONESIA): A CROSS-SECTIONAL STUDY

DOI : 10.20473/jphrecode.v6i2.29460
Ayu Sekar Pawening , Tri Martiana
83-92
Abstract : 168
PDF : 50

PDF

THE RELATIONSHIP BETWEEN MALNUTRITION AND SEVERE PNEUMONIA AMONG TODDLERS IN EAST JAVA, INDONESIA : AN ECOLOGICAL STUDY

DOI : 10.20473/jphrecode.v6i2.34831
Milistia Kristi Prastika , Erni Astutik
93-101
Abstract : 116
PDF : 49

PDF

CHEMICAL HEALTH RISK ASSESSMENT IN THE METALLURGY DEPARTMENT OF A MINING COMPANY, INDONESIA : A CASE STUDY

DOI : 10.20473/jphrecode.v6i2.23367
Yenni Miranda Savira , Arif Susanto , Aprilia Listiarini , Wiliam Engelbert Yochu , Edi Karyono Putro , Danny Rosalinawati Santoso , John Charles Willmot , Anita Johan
102-113
Abstract : 204
PDF : 64

PDF

EDUCATING THE IMPACT OF COCONUT SPROUT ON MATERNAL HYPERTENSION IN TANGERANG, INDONESIA: A CASE STUDY

DOI : 10.20473/jphrecode.v6i2.33514
Sumiaty Aiba , Desman Berkati Larosa , Maria Maxmila Yoche , Christie Lidia Rumerung , Komilie Sitomorang
114-124
Abstract : 90
PDF : 50

PDF

Literature Review

SYSTEMATIC REVIEW: FACTORS AFFECTING NURSE'S WORK STRESS IN HOSPITAL EMERGENCY ROOM DURING THE COVID-19 PANDEMIC

DOI : 10.20473/jphrecode.v6i2.34422
Dian Putri Suryati , Nuzulul Kusuma Putri , Normala Ibrahim
125-133
Abstract : 89
PDF : 43

PDF

FACTORS AFFECTING WORK FATIGUE IN INPATIENTS' FEMALE NURSES: LITERATURE REVIEW

DOI : 10.20473/jphrecode.v6i2.21714
Shafiera Rosnia , Dyah Utari , Agustina
134-143
Abstract : 75
PDF : 21

PDF

QUALITY IMPROVEMENT FOR MATERNAL AND CHILD HEALTH IN PRIMARY HEALTH CARE: A SCOPING REVIEW

DOI : 10.20473/jphrecode.v6i2.34624
Dhea Benedikta Tarigan , Inge Dhamanti

144-152
Abstract : 74
PDF : 56

PDF

IMPACT OF IMPLEMENTING A SURGICAL SAFETY CHECKLIST IN HOSPITAL: LITERATURE REVIEW

DOI : 10.20473/jphrecode.v6i2.34769
Ezha Gadis Rekly Arimbi , Inge Dhamanti
153-160
Abstract : 86
PDF : 45

PDF

THE USE OF COGNITIVE BEHAVIOUR THERAPY AS A TREATMENT OF INTERNET ADDICTION DISORDER IN ADOLESCENTS: LITERATURE REVIEW

DOI : 10.20473/jphrecode.v6i2.31158
Lutfian , Ayunda Puteri Rizanti , Ilany Nandia Chandra
161-169
Abstract : 142
PDF : 125

PDF

STUDY OF LITERATURE RELATED TO STAFF PERFORMANCE FACTORS' LINKAGES TO INCOMPLETE MEDICAL RECORD DOCUMENTS IN PUBLIC HEALTH CENTER

DOI : 10.20473/jphrecode.v6i2.31050
Rossalina Adi Wijayanti , Widian Almas Zatin , Novita Nuraini
170-180
Abstract : 84
PDF : 34

PDF

Back Matter

BACK MATTER

Abstract : 25
PDF : 22

PDF

National Accreditation

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IMPACT OF IMPLEMENTING A SURGICAL SAFETY CHECKLIST IN HOSPITAL: LITERATURE REVIEW

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ABSTRACT

Background: The Surgical Safety Checklist is part of WHO's efforts to reduce the number of deaths worldwide. **Purpose:** To analyze the impact of implementing the WHO Surgical Safety Checklist in hospitals. **Methods:** Article search was carried out through PubMed and ScienceDirect databases using keywords ("impact") OR ("effect") AND ("implementation") AND ("surgical safety checklist") AND ("hospital") . The total number of articles found was 195, but only six articles met the inclusion criteria. **Results:** A comprehensive study in 7 hospitals located in 4 countries found the impact of implementing the Surgical Safety Checklist in hospitals could improve the quality of care, reduce the length of hospitalization, reduce mortality and complications that cause morbidity, reduce treatment costs, improve surgical team communication, increase trust in the safety culture in the operating room, improve teamwork climate, safety climate, surgical outcomes, and improve patient safety. **Conclusion:** Surgical Safety Checklist can reduce mortality and morbidity, improve quality of care, reduce treatment costs, and affect the attitudes & perceptions of team members and patient safety.

Keywords : impact, effect, implementation, surgical safety checklist, hospital

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INTRODUCTION

Patient safety is a basic principle of health care. Research by the World Health Organization (WHO) in the United Kingdom estimates that the average incidence of injury to a patient is reported every 35 seconds. Likewise, in low- and middle-income countries. Health care safety is currently a major global concern. Unsafe and low-quality services will result in diminished or even harmful health outcomes (*WHO*, 2017).

There is evidence that nearly half of complications stem from surgical procedures. It is estimated that surgical site errors and surgical errors occur in approximately 50,000-100,000 procedures in the United States, equivalent to 1500-2500 incidents annually. The Joint Commission for Accreditation of Health Organizations found that more than 13% of reported side effects were due to incorrect surgical site. Analysis of 126 cases related to surgical site errors and errors during surgery in 2005 revealed 76% surgical site errors, 13% surgical errors, and 11% procedural errors (*WHO*, 2009). The most common incidence of patient complications was related to surgical procedures (27%), medication errors (18.3%), and health care-related infections (12.2%) (*WHO*, 2017).

In 2008, WHO has a patient safety program (safe surgery saves lives) which is part of WHO's efforts to reduce the number of surgical deaths worldwide, WHO published a document recommending the use of a surgical safety checklist with the aim of reducing the risk of accidents that could otherwise be prevented. during the surgical procedure (*WHO*, 2009).

WHO shows the impact of implementing a surgical safety checklist can reduce complications from 11% to 7% and reduce mortality by 53%. Since then it has been applied to more than 4100 hospitals, 1790 of which are actively used (Lacassie et al., 2016). Surgical safety checklists have been implemented at both institutional and national levels, currently used by most surgical service providers worldwide (*WHO*, 2017). Surgical safety checklist is a tool that has been promoted with the aim of improving patient safety, morbidity, and mortality (Anderson et al, 2017).

The rationale for the surgical safety checklist was to assist the operating team in reducing the number of surgical deaths worldwide, patient safety WHO consulted surgeons, anesthesiologists, nurses, patient and patient safety experts around the world to identify ten important goals for a safe operation, then compiled into a surgical safety checklist. Surgical safety checklists strengthen patient safety practices by encouraging better communication and teamwork. Thus, WHO formulated a surgical safety checklist which is divided into 3 parts, which are before induction of anesthesia (sign-in), before skin incision (time out), and before the patient leaves the operating room (sign-out).

Sign-in is carried out by nurses, anesthesiologists, and patients which consists of verifying the patient's identity, location, surgical procedure and other things that must be done related to anesthesia. The time-out is carried out by the entire team by confirming the names and roles of team members. In the sign-out phase, the surgical team will review the operations that have been carried out by checking the completeness of the equipment or other problems that need to be addressed *(WHO Patient Safety & WHO*, 2009).

The WHO surgical safety checklist has been proven to reduce morbidity and mortality as well as improve teamwork, communication and consistency of care in the operating room. Implementation of a surgical safety checklist can significantly reduce morbidity and mortality (an average of about 36%) (*WHO*, 2017).

In some country, the implementation of a surgical safety checklist can also improve team performance and good communication (Haugen et al., 2020). It can then be used to ensure that the surgical team consistently follows several patient safety measures, thereby minimizing the most common and avoidable risks that could compromise well-being (Gillespie et al., 2018). The aim of this study is then to assess the latest evidence of the impact of the implementation of the surgical safety checklist that has been implemented in hospitals.

METHOD

The method used in writing this article was a literature review. Data collection was undertaken through two data base sources: PubMed and ScienceDirect. The keywords used in writing the article were ((("impact") OR ("effect")) AND ("implementation")) AND ("surgical safety checklist")) AND ("hospital").

The search for articles was limited to the last five years (2016-2021). The articles used were in the form of original articles, full text, in English and limited by quantitative research. The writing of the article was in accordance with the purpose of knowing the impact of implementing a surgical safety checklist in hospitals. The study discussed the impact of implementing a surgical safety checklist in hospitals, without regional restrictions.

Extraction and identification of data is described in Figure 1:

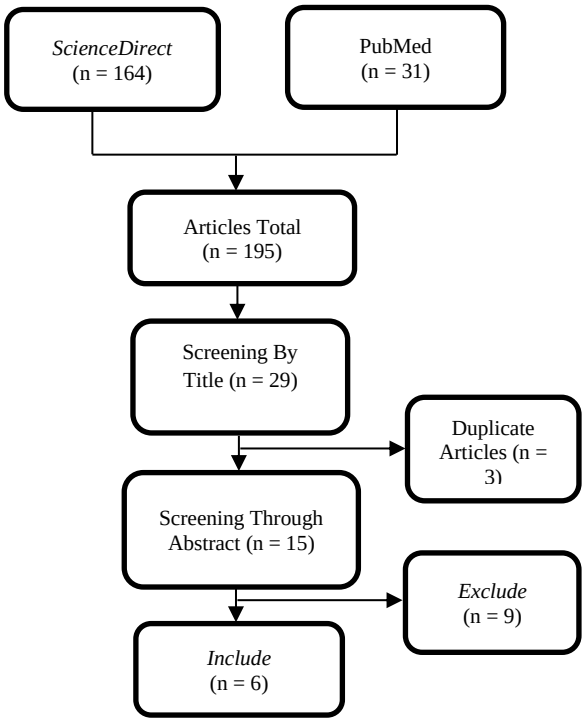

Figure 1. PRISMA Diagram

RESULT

Based on Figure 1 on the prism diagram, the researcher obtained as many as 195 articles that match the research keywords. Researchers screened articles using predetermined inclusion and exclusion criteria to obtain the final findings of 6 articles with a total study conducted in 7 hospitals located in 9 countries. The following is a table of study characteristics in the literature review.

Table 1. Study Characteristic

No.	Criteria	Number of articles
1.	Research Method	
	a. Quantitative Research	6
	b. Qualitative Research	0
	c. *Mixed Method*	0
2.	Sample	
	a. Surgical execution data	3
	b. Surgical team members	3
3.	Year of Publication	
	a. 2016	2
	b. 2017	1
	c. 2018	1
	d. 2019	1
	e. 2020	1
4.	Country	
	a. Latin America	1
	b. United States	2
	c. Australia	1
	d. Norwegia	2

Sources: The screening result of articles in the research

Based on Table 1, the research method used quantitative research with total 6 articles. The article sample uses 3 articles of surgical execution data and 3 articles of surgical team members. The year of publication of articles from 2016-2020, as many as 2 articles from 2016 and 1 article each from 2017-2020. The selected articles came from Latin America and Australia as many as 1 article. Then the United States and Norway with 2 articles each.

Table 2. Summary of the Research Results

Author (Year)	Study Design	Sample	Place	Results
Haugen *et al* (2019)	Randomized controlled trial Study (RCT)	Data on the application of Surgical Safety Checklist as many as 3702 (1398 controls compared to 2304 interventions Procedure)	Two Hospitals in Norway (Community Hospital and Tertiary Educational Programs)	1. Surgical Safety Checklist Implementation can improve the treatment process. a) An increase in the use of forced air warming blankets from 35.3% to 42.4% (p <0.001). b) Increased antibiotic before incision from 54.5% to 63.1%. c) Decrease in the administration of post -incision antibiotics from 12.5% to 9.8%, without antibiotic administration from 33.0% to 27.1% d) Surgical infection decreased from 7.4% (104/1398) to 3.6% (p <0.001). 2. Complications including breathing, heart, surgical infection, wound rupture, bleeding, and blood transfusion are all reduced significantly. 3. The average blood transfusion cost in the control procedure is USD 46.42 vs USD 36.39 in the intervention procedure (p ¼ 0.092). The cost is USD 28.03 in an intervention procedure that uses surgical safety checklist with high accuracy (all 3 parts, p ¼ 0.007), represent 40% reduction in blood transfusion costs.
Lacassie *et al* (2016)	Observation study, retrospective analysis.	Data on surgery (n = 70,639) during the period from January 2005 to December 2012.	Hospital at the Latin American Tertiary Health Treatment Center.	1. Decreased mortality rate before and after the application of Surgical Safety Checklist in hospitals from 0.79% [95% Confidence Interval (CI), 0.69-0.89] to 0.61% (95% CI, 0, 46-0.71) after the application [odds ratio (OR) 0.73; 95% CI, 0.61-0.89]. 2. The average inpatient length (LOS) is 3 days and 2 days for the period before and after the application of Surgical Safety Checklist, respectively (p <0.01).
Anderson *et al* (2017)	Prospective observational studies	8 Specialization of the main pediatric surgery that performs elective pediatric operations on weekdays.	Children's Memorial Hospital, Hermann, Texas	1. Based on 591 observed cases, 19% has at least one documented intraoperative delay. Cases without delays have an average level of compliance 7.6% compared to cases with a delay of 5.8%. 2. 2. The degree of loyalty to the implementation of the surgical safety checklist with cases without delay has an average compliance rate of 14.3% compared to cases of delay of 14.6%.
Cabral et al (2016)	Study design of *single-group* (*pretest* and *posttest*)	Voluntary sample of surgical team members. Participants included surgeons, nurses, and surgical technologists.	Broward Health Imperial Point Hospital, Ft Lauderdale, Florida	1. Showed an increase in the perception of surgical team communication by 6% as measured by SAQ from pretest to posttest, from an average score of 60.81 to 64.68 2. Nurses' perceptions of communication increased by a maximum of 12% from pretest to posttest. 3. Improved perception of communication for surgeons 4.0% and surgical technologists lower at 2.3%
Haugen *et al* (2020)	C*ross-sectional longitudinal study*	1754 operating room personnel to participate in the study, 920 of whom responded to the survey at three times in 2009, 2010 and 2017	Norway's largest tertiary teaching hospital.	Eight of the 12 dimensions of safety culture improved significantly over time with the largest increase being 'Hospital manager support for patient safety' from a mean score of 2.82 in early 2009 to 3.15 in 2017 (change in mean : 0.33, 95% CI 0.21 to 0.44).
Jager *et al* (2018)	Retrospective review study	Data from 21,306 surgical procedures, performed over a 5 year time period	Tertiary care centers in Australia	1. Postoperative mortality rate decreased from 1.2% to 0.92% 2. Length of stay decreased from 5.2 to 4.7 days (p = 0.014). 3. The reduction in mortality reached significance in the 2-3 year post-implementation period.

Treatment Quality

Implementation of a surgical safety checklist can improve the treatment process. The implementation carried out in the treatment process at the Norwegian University Hospital was able to improve the quality of nursing services including the use of forced air warming blankets and the administration of antibiotics before incision. There was a decrease in post-incision antibiotics, without antibiotics, and surgical infections decreased (Haugen et al., 2019). In addition, when compared in terms of the average length of stay (LOS) before the application of the surgical safety checklist, which is 3 days and after the implementation of the SSC, it is 2 days (Lacassie et al., 2016).

Mortality & Morbidity

Surgical safety checklist from WHO has been proven to reduce morbidity and mortality. The effectiveness of the surgical safety checklist can reduce mortality after implementing to patients. Research conducted in Latin American tertiary hospitals showed a comparison of mortality before and after implementation (Lacassie et al., 2016). Haugen et al (2020) stated that the initial evaluation of the surgical safety checklist showed a reduction in complications and mortality.

The study of Haynes et al (2017) revealed the implementation of an effective surgical safety checklist supported by a statewide surgical safety program, demonstrated a significant reduction in 30-day mortality in US South Carolina hospitals. If the application is not equipped and associated with the risk of complications after surgery, it has a higher tendency to die. By completing the three components of the surgical safety checklist, the risk of complications is lower (Mayer et al., 2016). If the surgical safety checklist is implemented properly, it can reduce postoperative bleeding and the need for blood transfusions (Haugen et al., 2019). Haugen et al (2020) in their research showed a reduction in complications by implementing a surgical safety checklist (Haugen et al., 2020)

Lower Maintenance Cost

Implementing a surgical safety checklist in US hospitals is estimated to result in cost savings after preventing at least 5 major complications. The observation results are estimated to be a reduction in costs related to blood transfusion after the implementation of the surgical safety checklist (Haugen et al., 2019). Likewise, based on the research of Anderson et al (2017) the application of a surgical safety checklist that is conducted correctly can reduce intraoperative delays which have an effect on reducing costs.

Attitudes and Perceptions of Team Members

Research conducted at Children's Memorial Hermann hospital had at least one documented intraoperative delay. When compared to cases with delays, they did not have a level of compliance with the use of a surgical safety checklist (Anderson et al., 2017). Operation delays are a frequent occurrence, a major cause of equipment-related delay issues. Some delays cannot be predicted or prevented, but the poor relationship between the surgical team's loyalty in implementing the surgical safety checklist will affect the delay. Operational delays can be reduced if you apply the surgical safety checklist correctly and appropriately. The degree of loyalty of the surgical team to the application of the surgical safety checklist differs between cases with delay and without delay (Anderson et al., 2017). According to Cabral et al (2016), if the surgical safety checklist is used over a long period of application, the effect on the perception of communication will be greater. In its application, it can increase the perception of surgical team communication, increase nurses' perceptions of communication, increase communication perceptions for surgeons and surgical technologists. Cabral et al (2016) re-added that the application of the surgical safety checklist not only increased the perception of communication among surgical team members, but as several team members stated that the implementation of the surgical safety checklist would increase trust in the safety culture in the operating room.

Molina et al (2016) in their research revealed that if used correctly, it can improve teamwork, including clinical leadership, communication, coordination, assertiveness, and respect. Implementation of the WHO surgical safety checklist has been shown to improve surgical team communication, teamwork climate, safety climate, and surgical outcomes (Cabral et al., 2016). The results of Ayabe et al's research (2017) examined that the

implementation of the surgical safety checklist had a visible impact on improving communication and on the use of the surgical safety checklist, which seemed to contribute to the staff in the operating room to build good communication, teamwork, and collaboration in the operating room.

Patient Safety

Patient safety is a basic principle of health care. Unsafe and low-quality services will provide poor results and can even harm patients (WHO, 2017). Eight of the 12 dimensions of safety culture improved significantly over time with the largest increase being 'Hospital managers' support of patient safety (Haugen et al., 2020). This is supported by Sokhanvar et al (2018) that the application of a surgical safety checklist can improve patient safety. The research of Schmitt et al (2018) proves that there is a significant reduction in the frequency of reported incidents when a surgical safety checklist is applied compared to no application. In the research of Gitelis et al (2017) conducted on the operating team that the surgical safety checklist has a positive impact on patient safety. In line with the research of Jager et al (2018), after the implementation of the surgical safety checklist the postoperative mortality rate decreased from 1.2% to 0.92%. Then the reduction in mortality reached a significant level in 2-3 years after implementation.

CONCLUSION

The results of the literature review show that the impacts of implementing a surgical safety checklist in hospitals are divided into several points including quality of care, mortality and morbidity, reducing treatment costs, attitudes and perceptions of team members, and patient safety. At the point of quality of care, it can improve the quality of care and reduce the length of hospitalization. The effectiveness of the surgical safety checklist can reduce mortality and morbidity. Good implementation will result in cost savings. Improve the attitudes and perceptions of team members include increasing the perception of surgical team communication, increasing trust in the safety culture in the operating room, improving teamwork, including clinical leadership, communication, coordination, assertiveness, and respect, improving teamwork climate, safety climate, surgical outcomes, and improve patient safety.

SUGGESTIONS

Hospitals are expected to implement a surgical safety checklist in carrying out surgery. Surgical safety checklist can provide safe and quality surgery for patients. Then it is hoped that further research will conduct studies on the implementation of the surgical safety checklist in Indonesia.

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CONFLICT OF INTEREST

Author have no conflict of interest.

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AUTHOR CONTRIBUTION

Author Ezha Gadis Rekly Arimbi served as data collector, data analysis, study design, writing article manuscripts, literature review, and bibliography. Author Inge Dhamanti served as study design, overseeing and reviewing the writing of article manuscripts, and revising article script.

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SURAT KETERANGAN

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Telah melaksanakan penelitian dengan judul sebagai berikut :

No.	Judul Karya Ilmiah	Tahun Pelaksanaan Penelitian
1.	Implementation of Computerized Physician Order Entry in Primary Care: A Scoping Review	2021
2.	Adverse Reactions of COVID-19 Vaccines: A Scoping Review of Observational Studies	2023
3.	Literature Review: Cause Factor Analysis and an Effort to prevent Medication Administration Error (MAE) at Hospital	2020
4.	A Literature review on the Identification of Variables for Measuring Hospital Efficiency in the Data Envelopment Analysis (DEA)	2021
5.	Telemedicine Use In Health Facility During Covid-19 Pandemic: Literature Review	2022
6.	Faktor yang Menghambat Pelaporan Insiden Keselamatan Pasien di Rumah Sakit: Literature Review	2021
7.	Comparison of Four Methods To Detect Adverse Events in Hospital	2015
8.	Infections Prevention and Control (IPC) Programs in Hospitals	2021
9.	Studi Komparatif Pengembangan Contact Tracing Applications Di Singapura dan Indonesia (Studi Kasus: TraceTogether dan PeduliLindungi)	2022
10.	Faktor Penghambat Pelayanan Kesehatan Rutin di Rumah Sakit saat Pandemi COVID-19	2021
11.	Governmental Policies in Managing COVID-19 Pandemic: Comparative Study Between Indonesia and Vietnam, Period of January – March 2020	2021

12.	Akses Pelayanan Kesehatan Ibu dan Anak di Puskesmas Selama Pandemi Covid-19	2022
13.	Comparison of Dental Care Policies Before and During The COVID-19 Pandemic: A Literature Review	2022
14.	Analysis of Implementation of Patient Identification In Hospitals to Improve Patient Safety in Indonesia	2022
15.	Literature Review: Implementation Of Patient Safety Goals In Hospitals In Indonesia	2021
16.	Literature Review: Hospital Service Quality During The COVID-19 Pandemic	2022
17.	Comparison of Hospital Emergency Room Management Regulations in Indonesia Before and During The COVID-19 Pandemic: Literature Study	2022
18.	Analisis Pelaksanaan Pelayanan Kesehatan Perorangan (Ukp) Di Puskesmas Sebelum Dan Selama Pandemi Covid-19: Literature Review	2022
19.	Perbandingan Kebijakan Pelaksanaan Imunisasi Rutin pada Anak sebelum dan selama Pandemi	2022
20.	Recommendation Analysis Of Mental Health Services For Health Workers During Pandemic Covid-19	2021
21.	Impact Of Implementing A Surgical Safety Checklist In Hospital: Literature Review	2023
22.	Quality Improvement For Maternal And Child Health In Primary Health Care: A Scoping Review	2023
23.	Implementation Of Root Cause Analysis On Patient Safety Iincidence In Hospital: Literature Review	2022
24.	Analisis Peran Stakeholder dalam Kapasitas Rumah Sakit akibat COVID-19: Literature Review	2022
25.	Lessons from Indonesia, a country with highest COVID-19 mortality rate in the world: dissecting multiple aspects	2022

Adapun penelitian tersebut layak dilakukan dan menghasilkan output yang sangat baik, meskipun belum ada ***Uji Etical Clearence*** karena menggunakan metode litteratur review . Demikian surat keterangan ini kami buat untuk dapat dipergunakan sebagai persyaratan pengusulan Jabatan Fungsional Lektor Kepala.

Surabaya, 13 April 2023

Hormat kami,

Dr. Sangi Martini, dr. M.Kes

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