Systematic Literature Review: Analysis of Assessment Elements of OHSMS in Indonesia Hospital

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Abstract. As a workplace, hospitals have high hazards and risks, especially related to occupational health and safety (OHS). Therefore, to protect human resources, assets, and hospital facilities, a comprehensive system is needed to regulate the implementation of OHS in hospitals. To ensure the OHS system is implemented properly, special assessment instruments are needed. Furthermore, to develop an appropriate assessment instrument for hospital care, an analysis of the assessment elements of the hospital’s Occupational Health and Safety Management System by reviewing the previous research results. Based on searches on the Science Direct, Jstor, SpringerLink, ProQuest, Sage Publication, Oxford Journal, Google Scholar, and Garuda Dikti databases, 486,132 journals were obtained. Through the evaluation of inclusion and exclusion tests, 18 literature was selected. It was found that the important elements needed in assessing the hospital’s Occupational Health and Safety Management System implementation are: implementation of OHS, building and maintaining commitment, management of OHS risk, and developing skills and capabilities of hospital staffs.

1. Introduction

As a workplace, hospitals have complex potential hazards and risks due to the number of human resources with various backgrounds (labor intensive) and using a variety of cutting-edge tools and technologies such as medical devices (technology intensive). In 2015, the National Safety Council (NSC) [1] reported that the risk of accidents at work in health care facilities is higher than in other industries. Based on the research of Dr. Joseph in 2005-2007 noted that work accidents due to syringes had the highest percentage of incidents among health workers, reaching 73% of the total accidents. Another study of two hospitals in Tana Toraja District also noted that more than 60% of hospital staff had work accidents. Trisilawati (2006) reported that there was a fairly large of workplace accidents of 57.83% and work-related disease of 21.69% at RSUD Dr. Haryoto Lumajang. The Covid-19 pandemic condition has added the important roles of Occupational Health and Safety Management System in hospitals. According to the Head of the Department of Hospital Management, Hasanuddin University, Irwandy, the death rate for Indonesian health workers reached 6.5%. This means that for every 100 deaths, there are about 6-7 health workers who die [2].

To protect human resources, assets, and hospital facilities, a comprehensive system is needed to regulate the implementation of OHS in hospitals. The government requires each hospital to develop a Hospital Occupational Health and Safety System as stipulated in the Minister of Health Regulation No. 66/2016 on Hospital Occupational Health and Safety. The Chapter VIII Paragraph 3 (three) of the
Minister of Health Regulation No. 66/2016 regulates an external assessment of Hospital Occupational Health and Safety integrated with hospital accreditation. The Minister of Health Regulation No. 12/2020 on Hospital Accreditation states that hospital accreditation in Indonesia is carried out by an independent institution designated by the government, i.e. the Hospital Accreditation Commission [3]. Based on the results of research at the Lebanese Hospital conducted by Habib et al. [4], although other standards in accreditation are related to OHS issues, the number of elements related to OHS are still relatively small and causes aspects of OHS assessment to be underpaid attention. Thus, it is found that many hospitals passing the accreditation have not fully met OHS standards.

It can be concluded that the assessment instrument currently used in the hospital has not been able to provide an overview of the implementation of the hospital’s occupational health and safety management system as a comprehensive system. Therefore, it is necessary to study the development of assessment instruments to evaluate the occupational health and safety management system in hospitals.

2. Methodology

This study uses a systematic literature review with sequential steps in finding, collecting, knowing, understanding, analyzing, synthesizing, and evaluating appropriate references to become the foundation for the topics written. The aim of a systematic literature review is to answer research questions by bringing together the literature evidence.

Table 1. PICO Criteria

| P (Population) | I (Intervention) | C (Comparison) | O (Output) |
|----------------|------------------|----------------|------------|
| Hospital       | Hospital Occupational Health and Safety Management System | Assessment elements of Hospital Occupational Health and Safety Management System and SNARS | Assessment instrument that if applied has an impact on improving the quality of the implementation of Hospital Occupational Health and Safety Management System for all hospital stakeholders |

Table 2. Research Question

| RQ 1 | What elements are assessed in the evaluation of the Hospital Occupational Health and Safety Management System from 2010-2020? |
| RQ 2 | What are the key elements assessed in the evaluation of the Hospital Occupational Health and Safety Management System? |
| RQ 3 | What types of research methods are used to assess the implementation of the Hospital Occupational Health and Safety Management System in the selected journals? |

Research questions are defined to keep reviews focused and designed using the criteria of Population, Intervention, Comparison, Outcome (PICO) [5]. Table 1 shows the PICO structure of the research questions. Meanwhile, the research questions can be seen in Table 2.
Literature selection was carried out using SLR steps consisting of identification, feasibility selection, and writing/article selection (see Figure 1). The databases used in the search for articles are Science Direct, JStor, Springer Link, Sage Publication, Proquest, Oxford Journal, Google Scholar, and Garuda Dikti (national database). The access uses full open access library of the Universitas Indonesia with the documentation method.

Data were collected through several stages including:
- Observation
  This stage collected data through observation to database sources on the internet.
- Literature review
  This stage reviewed the data related to the SLR method in journals obtained from a predetermined database.
- Documentation
  This stage inputted the data into the Mendeley software.

The following are steps taken from observation to documentation obtained through one of the sources: http://googlescholar.co.id.
1. Visit http://googlescholar.co.id.
2. Type the keyword “Occupational Health and System Evaluation in Hospital” in the search form. This step can be seen in Figure 2.
3. Select Range in Year, choose 2010-2020 to determine the source of the source year to find the issue of Occupational Health and System Evaluation in Hospital. The results displayed by the Google Scholar search process are 18,200 journals as shown in Figure 3.

To ease the search, the following inclusion and exclusion criteria can be used.

| Table 3. Inclusion and Exclusion Criteria |
|------------------------------------------|
| **Inclusion Criteria**                   |
| The data used are in the range of 2010 - 2020 |
| Research is written in English and Indonesian |
| Research discusses the occupational health and safety management system of hospitals |
| **Exclusion Criteria**                   |
| The data in the research comes from newspapers, opinions, or case reports |
| Research only discusses patient safety |
| Research was published at the conference |

3. Result and Discussion
A literature search from a total of 6 databases resulted in a total of 486,132 articles as presented in the chart below:
From a total of 486,132 articles, screening was carried out using inclusion and exclusion selection, and it obtained 23 literatures (Table 4). From a total of 23 selected literatures, 18 articles fulfill the quality assessment. The articles selected and assessed in this review are articles that are relevant to the research question and show the assessment parameters of instrument for the preparation of the hospital’s occupational health and safety management system. Meanwhile, the articles excluded from this review are articles that are not relevant to this research question and do not show the assessment parameters of instrument for the preparation of the hospital’s occupational health and safety management system.

Table 4. Results of Literature Selection based on Database

| No | Database            | Articles shown in the initial search | Articles shown after the inclusion and exclusion criteria were used | Articles shown after title screening | Articles shown after abstract screening | Articles shown after full text and quality screening |
|----|---------------------|--------------------------------------|-----------------------------------------------------------------|-------------------------------------|----------------------------------------|-----------------------------------------------|
| 1  | Science Direct      | 43,640                               | 22,021                                                          | 56                                  | 23                                     | 8                                             |
| 2  | ProQuest            | 109,559                              | 29,027                                                          | 33                                  | 12                                     | 4                                             |
| 3  | JSTOR               | 12,507                               | 1,326                                                           | 8                                   | 2                                      | 1                                             |
| 4  | Springer Link       | 10,178                               | 2,688                                                           | 19                                  | 7                                      | 4                                             |
| 5  | Sage Publication    | 6,904                                | 1,877                                                           | 15                                  | 1                                      | 1                                             |
| 6  | Oxford Journal      | 2,302                                | 679                                                              | 6                                   | 1                                      | 1                                             |
| 7  | Google Scholar      | 301,000                              | 18,200                                                          | 95                                  | 6                                      | 3                                             |
| 8  | Garuda Diki         | 42                                    | 36                                                               | 16                                  | 4                                      | 1                                             |
|    | TOTAL               | 486,132                              | 75,854                                                          | 248                                 | 56                                     | 23                                            |

Judging from the country of origin (Figure 5), the most literature comes from Canada, followed by America and Iran. Furthermore, if these countries are grouped into the division of continental areas, the literature will be spread across 4 continents, namely Asia, America, Europe, and Africa. The percentages for each continent are as follows: Asian continent (5 literature/28%), American continent (7 literature/39%), European continent (3 literature/17%), and African continent (6 literature/33%). Based on Statista 2020 data, many hospitals in Canada and America are ranked in the Global Top 100 Hospitals.
The results of the search for assessment elements of instrument for the preparation of the hospital occupational health and safety management system show that there are 11 assessment elements needed to determine whether a hospital has implemented Occupational Health and Safety Management System as shown in Figure 6.

![Figure 5. Distribution of Literature Data by Country](image)

**Figure 5. Distribution of Literature Data by Country**

From 11 assessment elements, 48 sub-elements were assessed from 18 selected literature. The results of the search for factors show 56% supervisory assessment elements, 44% OHS policy, 44% commitment and leadership management, 39% hazard identification and risk assessment, 39% training for workers, 94% OHS programs, 22% emergency preparedness and response, 33% monitoring standards, 28% reporting and deficiencies repair, and 22% work systems, training strategies, maintenance, repair and change, communication and awareness, infection control programs, emergency and disaster preparedness, and fire protection and detection.

Based on this percentage, a sequence of important parameters based on the highest percentage is arranged as follows:

1. Supervision, up to 56%
   
   In OHS MS, supervision has an important role in all lines of the organization. Supervision has the function of ensuring the implementation of OHS MS goes well through providing information, instructions,
training and ensuring consistency in the implementation of procedures. Effective supervision is structured based on work standards, physical and the environmental aspects. Supervision also plays a role in shaping the OHS culture in an organization. To ensure that supervision can run well, the fulfillment of supervisor competencies is an absolute requirement. Supervision that does not function properly can be one of the factors causing work accidents. The number of supervisors is determined by the complexity of the work and the risks associated with the work [6]. The supervisory assessment based on PP 50/2012 includes the development and assurance of implementation of commitments, organization, human resources, regulations and legislation on the implementation of the occupational health and safety management system, occupational safety, inspection, testing and measurement of the implementation of occupational health and health. safety management system, emergency and hazard control, deficiency reporting and correction, and audit follow-up.

2. Commitment management and leadership and OHS policies, up to 44%
A study by Ghahramani [7] found that senior management commitment in companies has an important role in the successful implementation of occupational health and safety management system. Assessment can be done by looking at management participation in OHS activities, management support through provision of funds for OHS programs, OHS policy formulation, OHS policies and objectives, integrating OHS into business processes, promoting OHS culture, and commitment to continuous improvement [8].

3. Hazard identification and risk assessment, up to 39%
The objectives of occupational health and safety management system are to protect workers and the workplace, reduce the number of work accidents, minimize inadequate information, and increase employee awareness, from a multi-disciplinary point of view. As one of the most important OHS management processes, OHS risk management is incorporated into regulations related to occupational health and safety management system. The objective of OHS risk management is to identify sources of risk and determine control measures before an injury occurs. OHS is just as important in health care settings as it is in industrial or agricultural settings. Healthcare workers are at risk of exposure to harmful biological, chemical and physical agents as well as repeated strains, violence and fatigue, many of which may be life-threatening. Exposure to hazardous agents depends on the occupational category and work environment of the health worker [9].

4. Training for workers, up to 39%
Training for workers in OHS is an important factor that can affect the effectiveness of the occupational health and safety management system. Safety training helps employees to increase their knowledge, skills, and ability to do work safely. It can also lead to increase the knowledge of employees as they have sufficient information about the importance of safety in their work and even reduce workplace accidents. A study by Gimeno et al. [10] found that public hospitals in Costa Rica, which did not conduct safety training for employees, reported 41% more injuries when compared to those who did the training.

4. Conclusion
The use of assessment instrument of Hospital Occupational Health and Safety Management System is not yet able to assess a comprehensive Occupational Health and Safety Management System. Based on the results of this study, there are 11 main elements, and 48 sub-elements of assessment used to assess Hospital Occupational Health and Safety Management System. Thus, the assessment can produce a complete picture of the implementation of the Hospital Occupational Health and Safety Management System in accordance with OHS regulations and standards. Based on the results of the analysis, there are 4 key sub-elements in the evaluation of the Hospital Occupational Health and Safety Management System, namely: OHS implementation, building and maintaining commitment, making and documenting OHS plans, and developing skills and abilities. These four elements must be included in the assessment instrument of Hospital Occupational Health and Safety Management System.

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