Maturity Model and Safety Culture in Healthcare: A Systematic Review

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Abstract

Background: Research on safety culture maturity in hospitals is rare and still focuses on patient safety, not yet involved safety and occupational accidents. Previous research uses the *Manchester Patient Safety Framework* (Ma PSaF) instrument to measure 5 levels of patient safety culture maturity: Pathological, Reactive, Bureaucratic, Proactive and Generative. This study aims to investigate the level of patient safety culture maturity in hospitals.

Method: This study used a systematic literature review of 5 databases: PubMed, EBSCO, Proquest, Science Direct and Scopus. Inclusion criteria in this study are articles related to patient safety criteria; research outcome in this study is patient safety maturity level; 3) articles in the form of results obtained from the keywords used;articles have been published since 2009-2019; the article is an academic journal;english articles. 498 articles were obtained and after screening 2 articles selected.

Results: The two articles involved 2 countries: United Kingdom and Indonesia. There are 10 indicators examined in both studies which one developed 10 indicators with 24 dimensions. Study in UK, using univariate quantitative method. Research in Indonesia uses a qualitative method by interviewing experts and literature studies, there is a change in the definition of maturity in 3 dimensions to maintain research reliability, such as safety, communication and teamwork. Maturity of patient safety culture in the UK is proactive level.

Conclusions: There are 10 keys indictors for maturity of a patient safety culture: commitment to overall continuous improvement, priority given to safety, system errors and individual responsibility, recording incidents and best practices, evaluating incidents and practices best, study and make changes, communication about safety issues, personnel management and safety issues, staff education and training, teamwork. At present the safety culture maturity measuring instrument only patient safety. Further research should measure the maturity of safety culture more comprehensive including patient safety, occupational safety and health (OSH).

Keywords: *Maturity of patient safety, patient safety, occupational safety and health, hospital, clinic.*

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Introduction

Maturity of safety culture describes attitudes and behaviors related to incident and accident prevention, reporting, investigation and accident solutions. Maturity of safety culture is used to develop safety culture in organizations [(1)]. According to Westrum,

1988 divides safety culture maturity groups based on how organizations handle safety information, namely pathology, bureaucratic and generative which are then developed by adding reactive and proactive levels[2][3].

Safety culture maturity models help organizations to know the level of safety culture conditions so that efforts can be made to improve culture[4][5]. Safety culture is defined as a set of organizational characteristics and attitudes as well as the behavioral characteristics of its workers related to organizational performance in the aspect of safety[6][7]. The WHO publication in 2004 collected research figures on KTD in hospitals in various countries, namely the United States, United Kingdom, Denmark, Australia, New Zealand, Canada, found to range from 3.2 to 16.6%[8]. It is estimated that almost 50% are preventable events [9].

National Health and Safety states that safety culture organizations influence the behavior of workers in terms of taking risks, following rules and talking about security[10]. Good safety culture practices can have an impact on reducing individual accidents and can stimulate the risk assessment process that causes these accidents [11]. There are 9 instruments that have been formulated to measure safety culture and climate in the health service sector, where 8 instruments use quantitative method with a Likert scale and only 1 instrument measures maturity using qualitative method, namely *Manchester Patient Safety Framework* (Ma PSaF). In Indonesia, patient safety incidents were reported by hospital patient safety committees in 2006 as many as 145 incidents. In 2007 to 2011 457 incidents occurred, 11.23% in the nursing unit, 6.17% in the pharmaceutical unit and 4.12% by doctors. Hospital patient safety committee report for 2008 found the case of near-death 47.6%, side effects (46.2%).[12]

The hospital is one of the organizations providing health services that also should guarantee the safety of human resources, namely hospital workers. Hospital is a place of work that has the risk of workplace accidents and the potential to cause workplace accidents or occupational diseases[13]. *National Safety Council* (NSC) reports that the number of accidents that occur in hospitals is around 41% [14].Data from the Bureau of Labor Statistics in the United States reveals that injuries and illnesses that occur in health workers are 2 times greater than in the private industry as a whole[12][15][13]. So this study aims to determine the maturity model of safety culture in health care.

Method

Eligibility Criteria: This research is a systematic literature review with electronic literature searching of academic journals with a certain criteria. Literature on patient safety maturity is considered relevant if it meets the inclusion criteria, which are 1) articles related to patient safety criteria; 2) research outcome in the form of patient safety maturity level; 3) articles in the form of results obtained from the keywords used; 4) articles have been published since 2009-2019; 5)the article is an academic journal; 6) English language articles. The number of articles found was 533.

Search Strategy: All references that have been found are managed using endnote software. Study selection process includes 4 stages: identification, screening, eligibility and include. Keywords in this study were maturity of safety culture AND healthcare used to search articles on the database. The number of articles obtained as many as 498 articles that was then screened so as to obtain articles eligible to be synthesized as many as 2 articles. The outcome definition is the level of patient safety maturity in health services consisting of Pathological, Reactive, Bureaucratic, Proactive and Generative. The result of articles presented using instruments of Preferred Reporting Items for Systematic Reviews & Meta-analyses (PRISMA) and flowchart arranged according to checklist guidelines from PRISMA 2009.

Quality Assessment: Assessment of research quality used standard criteria that test for misclassification, selection and reporting by evaluating factors of sampling strategy, adequacy of samples, anticipation of bias, focus of intervention and comparison groups, analysis, suitability of statistical tests, description of intervention procedures, determination of inclusion criteria and exclusion, limitations of research and reporting of outcome data. Study quality was classified according: high (score 8 to 12), moderate (score 5 to 7) or low (score 4 to 0). The article used is the value of Quality Assignment≥8.

Results

From the literature search results with systematic literature review techniques obtained 498 articles with the keywords maturity of safety culture and healthcare. Duplicate selection and open access are obtained 480 articles and the we screened (457 articles are not according to population, 18 are not in accordance with

outcome, 1 article is systematic review/literature review and 4 articles are researching not in health services). Two articles are eligible to besynthesized.

The research were obtained from hospitals in United Kingdom and Indonesia. The method of study was pilot study and qualitative research through surveys and interviews with experts about the maturity of patient safety culture. Measuring instruments used in the study are Ma PSCAT (Manchester Patient Safety Culture Assessment Tool) and Ma PSaF (Manchester Patient Safety Framework). Statistical analysis in both journals used univariate analysis and qualitative.

Study by Madelyn P. Law, et al[16] showed that the highest Hamilton Health Science (HHS) teamwork is proactive. Design method in the study was pilot study and employed survey using Ma PSaF. Response rates ranged from 33 to 85%, pathological rates 6.14%, reactive rates 10.53%, bureaucratic rates 12.28%, proactive rates 58.11%, generative rates 12.94%.

The second study was by Arum Astika, et al[17] showed that modifications Ma PSaF from 10 variables to 24 dimensions in research. There were different definition in 3 variables before and after for reliability in the maturity level. Design method in this study was qualitative research that used experts interview and literature study approach. There is a change in the definition of 5 levels of maturity for 3 dimensions to maintain reliability, such as the priority dimensions of safety, communication and teamwork.

Discussions

From the results of this study it appears that research on patient safety maturity is still very rare. Safety maturity research was carried out in hospitals and clinics. In the study of Madelyn P. Law, 2010 in the United Kingdom, 10 variables were measured using The Manchester Patient Safety Culture Assessment Tool (Ma PSCAT)[16]. Ma PSCAT is a collaboration between researchers in Unted Kingdom and Canada based on MapSaF. The study was conducted in the form of a survey of hospital workers using patient safety culture maturity instruments (Ma PSaF). There are 10 variables studied related to patient safety. The results of the highest maturity research at the level of Proactive (58.1%), Bureaucratic (12.28%), Generative (12.94%), Reactive (10.53%), Pathological (6.14%). The results describe the level of proactive or generative maturity there are safety priority variables (73.01%), incident evaluation (68.42%) and collaboration (71.05%). The bureaucratic level includes commitment to continuous development (82.4%), system errors and individual responsibility (96.26%), recording of incidents and best practices (85.84%), learning and effective change (88.29%), safety communication (72.56%) and training and education of workers (82.34%). At the reactive level are management personnel for safety (84.41%).

Arum Astika Research, 2017 in Indonesia, it was conducted qualitatively. Researchers conducted interviews with experts and study literature. The study used a modification of 10 Ma PSaF maturity variables into 24 measured dimensions. And there is a change in definition at 5 levels of maturity for 3 dimensions to maintain reliability, namely the priority dimensions of safety, communication and teamwork. According to NPSA(18), the lowest level of safety culture maturity is Pathological, where patient safety has not been considered. Reative level if the conditions in a patient safety event. Bureaucratic level if there is a patient safety issue system Proactive level if workers in the organization are alert and think about patient issues that might occur. And at the Generative level where the patient safety system is integrated in the organization.

Maturity models describe the development of an entity over time. This entity can be anything that is interesting such as humans, organizational functions, etc. (19)or a collection of structured elements that describe the characteristics of effective processes at various stages of development. It also suggests demarcation points between stages and the method of transition from one stage to another (20).Maturity models can be used as a tool to assess and make improvements to the organization's culture towards a more mature level of safety [5][20][21]. The measurement of cultural maturity is based on a comprehensive set of criteria, measuring an organization's ability to make continuous improvements (23). Measurements can be made using group discussion method, interviews, questionnaires, audits and checklists (21).

In the field of health services, there are 8 instruments measuring patient safety culture using quantitative method with a Likert scale such as HSOPSC, MSI, SCSu, PSCHO, SCORE, SAQ, Victorian SCS. There is only 1 measurement of patient safety culture maturity using a qualitative method, the Manchester Patient Safety Framework (Ma PSaF). The use of qualitative method can provide an in-depth explanation of worker

perceptions so as to combine quantitative and qualitative method to get a complete picture of safety culture(24). According to Weigman, 2002 explains that to assess safety culture it is necessary to use a combination of quantitative method with structured interviews, surveys and questionnaires as well as qualitative method that can be used by means of observation, FGDs, prior information reviews and case studies. This combination of method is usually known as triangulation (25).

Conclusions

This study found evidence that hospital-related research on patient safety culture maturity is still very rarely studied. There are no studies in hospitals that combine patient safety with occupational safety and accidents. In the United Kingdom, the maturity of patient safety in hospitals is at a proactive level. In Indonesia there needs to be improvements in terms of commitment, audits, policies, patient safety priorities, risk management systems, patient safety practices, causes of incidents, patient safety culture, feelings and reporting systems, data analysis, focus and results of investigations, incident learning, people in determining changes, communication about patient safety between staff, patients or both.

Based on the two articles found the similarity of basic instruments used in measuring the maturity of a patient safety culture consisting of 10 indicators namely commitment to overall continuous improvement, priority given to safety, system errors and individual responsibility, recording incidents and best practices, evaluating incidents and practices best, studying and influencing change, communication about safety issues, personnel management and safety issues, staff education and training, teamwork. At present the safety culture maturity measuring instrument only prioritizes patient safety. So that further research is needed that can measure the maturity of safety culture in a more comprehensive hospital including patient safety and occupational safety and health (OSH). In the article, the data analysis is still descriptive so further research needs to use statistical analysis to determine the predictors associated with the maturity of patient safety culture.

Ethical Considerations: Ethical clearance of this study is received from the Ethical Committee of the Faculty of Public Health at Universitas Indonesia,number:17/UN2.F10.D11/PPM.00.02/2020.

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