

# Information Systems and Patient Safety Incident Reports: A Systematic Review of Literature and Observational Incident Reporting System in Hospitals

Savitri Citra Budi, Sunartini, Lutfan Lazuardi, Fatwa Sari Tetra Dewi

**ABSTRACT**--- An electronic patient safety incident reporting system is established as an effort to save patients, health workers and management from the second incident to recur. It requires all staff's participation to develop an effective incident reporting culture. Objectives: To explore articles about the patient safety incident reporting system, and observe the incident reporting system in type B hospitals in Yogyakarta, Indonesia. Method: Undertaking a systematic review of literature along with the keyword "(patient safety) AND (hospital incident reports\* OR patient safety event reporting)" based on the PRISMA reporting guide and conducting observational studies on the incident reporting system in type B hospitals in Yogyakarta, Indonesia. Results: A systematic review presents a pattern of patient safety related to incident reporting systems: procedures, data content, goals, challenges, improvement efforts, and inhibiting factors for incident reporting so as to provide information for the development of incident reporting systems. Conclusion: An electronic incident reporting system can increase officers' motivation to report incidents, and facilitate the patient safety team to analyze the incident reports and report the results.

**Keywords**— Incident Reporting System, Patient Safety.

## I. INTRODUCTION

The patient safety culture prevails in the hospital performance evaluation criteria. This cultural application reflects the continuity of incident reporting. Internal reporting provides information on all types of incidents the staff found and reported to the quality manager who is responsible for analyzing incident reports. In the sentinel event, the quality manager's task is to analyze the root of the problem and reporting to the health ministry level [1]. Proper socialization of incident reports is useful to prevent the occurrence of the second incident [2]. Incident reports are learning materials for the staff to improve the patient safety, so that innovation is set to get a participatory, transparent, non-punitive, easy, efficient and functioning reporting culture for learning.

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The review of articles presents several incidents in developed, middle-income, and low-income countries. Results of research in the middle and low income countries show a rate of Unexpected Events (UE) ranging from 8% [3] to 2.9% in Utah and Colorado [4]. Unexpected Events (UE) in the United Kingdom occur in surgical cases by 20-25% [5]. In New York, approximately 4% of patients were accidentally harmed as a result of treatment [5]. Researchers found the number of incidents in 2016 in several type B hospitals in the Special Region of Yogyakarta, Indonesia. One of the private hospitals reported 100 incidents, other private hospitals reported around 50 incidents, 10 incidents occurred in the government hospitals, and 25 incidents were found in the local government hospitals. Meanwhile, education hospitals did not publish the number of incident data for confidentiality reasons. As the record shows, the number of reported incidents does not reflect indicators of services quality, but it is an illustration of an incident reporting culture in hospitals.

This article systematically reviews a range of incident reporting as a method to improve the patient safety through an incident reporting culture. A systematic review of literature is related to incident reporting procedures [6] [7], contents of incident reporting data [7][8][9], the learning side [8]–[15], purpose of reporting incidents [15], challenges in carrying out a reporting culture [10] [14], efforts to improve the culture of incident reporting [6] [10] [12] [14]–[19], development of incident reporting systems [7] [8] [15] [19] [20], and inhibiting factors [7]–[9] [12] [19]. Thus, as obviously expected, such a systematic review is likely to improve the culture of incident reporting.

## II. METHOD

This research is a systematic review of literature undertaken by collecting relevant articles using guidelines from PRISMA Reporting and observational studies of incident reporting systems in type B hospitals in Yogyakarta, Indonesia. Steps of research include determining (1) eligibility criteria; 2) the source of information; 3) data selection stages; 4) data collection processes; and 5) data analysis.

*Eligibility Criteria*



The inclusion criteria for this research sample are explained in the following data analysis guidelines:

Criterion 1: Original research, and open access data in the last 10 years (January 2008 - April 2018), using English, and the inclusion of health and medical research groups. This criterion was chosen to make it easier for researchers to find out research data.

Criterion 2: Research that discusses the culture of patient safety incident reporting specifically regarding procedures, formats, reporting incidents as learning materials, benefits, challenges, and efforts to increase reporting on patient safety incidents. The determination of Criteria 2 aims to answer research questions.

Criteria 3: The location for a preliminary study in type B hospitals in the Special Regions of Yogyakarta, Indonesia.

The researchers used a PRISMA's guide to get results in accordance with the research theme. Not all PRISMA's guidelines are used considerably as to expand the research results. Data search results are presented in Figure 1.

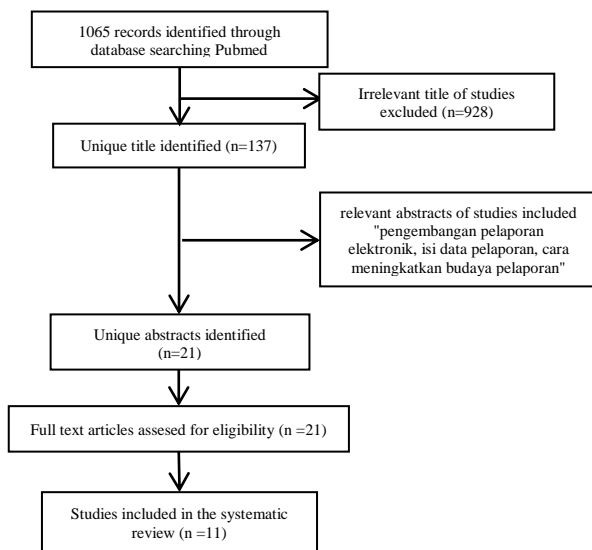


Fig 1. Articles Search Results

#### Sources of Information

In what follows, researchers collected relevant articles from the PubMed online database and continued with an observation study of incident reporting systems in type B hospitals in Yogyakarta, Indonesia.

#### How to Select Data

Research data are generated through several stages:

- (1) Check the standard terms in the subject heading list using the Medical Subject Headings (MeSH) application. MeSH is used to find out similar terms from the keyword "patient safety" and advanced search with the keyword "incident reporting".
- (2) Article search keywords use "(patient safety) AND (hospital incident reports\* OR patient safety events reporting)".
- (3) Conduct an article search on the PubMed database that generated 1065 articles.
- (4) Carry out an analysis based on the eligibility criteria in a title choice including the term "reporting" in 137 articles.

- (5) Subsequent searches based on service criteria in the abstract and discussion: the development of electronic reporting, content of reporting data, ways to improve a reporting culture in 21 articles.
- (6) The last analysis is undertaken by reading research articles, so that 11 articles can be obtained. These search results are used as materials to review.
- (7) Conduct observational studies of incident reporting systems in type B hospitals in the Special Region of Yogyakarta, Indonesia.
- (8) Conduct an analysis and comparison of the results of a systematic literature review and observation study.

#### Processes of Collecting Data

The data collection is based on established guidelines including years, topics, keywords, types of articles, and contents. Articles that meet the eligibility criteria are analyzed by reading the full texts and the researcher extracts from the research data. The Zotero application is used to facilitate the management of collected data for an ease of citation writing later.

Preliminary studies were carried out by interviewing the quality team and patient safety authorities at hospitals continued with observing the incident reporting form at hospitals.

#### Data Analysis

The data analysis used guidelines from The Cochrane Collaboration Handbook for Systematic Reviews. This aims to avoid a bias among researchers who involved in conducting systematic reviews.

#### Results

The application of patient safety culture is interesting for some concentration organizations on this matter, for example, Agency for Healthcare Research and Quality (AHRQ). In America, AHRQ has a task to set a format of incident reporting, while Patient Safety Organizations (PSOs) manage to ensure confidentiality and legal protection, so that a patient's safety culture can be built [11]. This policy is framed to provide an easy implementation of incident reporting. The patient safety incident report provides indirect insight into hospital staff concerning incidents, handling, documentation, and communication with related parties [10]. Reporting technology is an effort to make it easier to carry out a culture of incident reporting with the use of computer applications, for example, incident reporting (Carl) [10], the National Reporting and Learning System (NRLS) [15], and Critical Incident Reporting Systems (CIRS) [6].

Incidents are interpreted as "adverse events", which are called unexpected events that a patient's experiences, causing a loss of the patient's life during hospital treatment. The term "near-miss" is defined as an incident that almost occurs, but it can be prevented (because of luck) and does not lead to events that endanger the patient. "Harm" is an injury to a patient that results in an extension of treatment due to a temporary or permanent physical or psychological

loss such as a loss of social function or up to death. The incidence of deterioration in the patient's condition as a result of natural disease progression is not considered the definition of "harm" [9].

#### *The Purpose Of Incident Reporting*

The use of incident reports for learning can improve patient safety. Building a patient's safety culture that does not blame and guarantee legal protection can encourage better reporting of incidents [15]. Incident reporting management requires a good organization, so that the report serves as a good learning system for staff. Valid collection of incident data, effective processes, and appropriate socialization to support the second incident can be prevented.

#### *Incidents Reporting Procedures*

A quick reporting demand and a root cause analysis make it difficult for the department to provide detailed data. It is necessary to create a policy of two reporting periods, first to report the existence of incidents and second to provide detailed data including an analysis of the root of the incident problem. Reporting procedures are designed in two periods to fulfill the contractual demands. The first report contains the date the incident was found, the location, the cause of the incident, and the incident rate. Reports deal with the incident reporting system that are automatically sent through email to the director. The second report must be sent prior to a week of the first report, containing details of the incident and the results of analysis of the cause of the problem, including the incident of an anonymous form that will be sent to the department on the seventh day and so on (every day). If the second report has not been sent, the notification email will be sent automatically until the second report is sent. The patient safety team conducts meetings every month to determine important factors or efforts that improve patient safety in each department [7].

A result of studies in several type B hospitals in Yogyakarta, Indonesia, shows similarities in the reporting system of incidents. Hospitals apply the Indonesian government's incident reporting system standard [20]. The hospital innovates incident reporting procedures to get the convenience and comfort of officers in reporting. Variations in the reporting of incidents are closely related to systems and procedures. Manuals of incident reporting systems are implemented in private hospitals, government-owned referral hospitals, education hospitals, and regional government hospitals. While private hospitals and private education hospitals use computerized incident reporting systems.

The second variation is in line with the reporting procedure, the procedure for reporting incidents in private hospitals starts from reports by all health workers using a system that aims at increasing the hospital quality team. The quality team analyzes incident reports with two conclusions, namely, returning the problem to the department to complete with a simple investigation or conclusion to the two hospital quality teams by forming a team to carry out a Root Cause Analysis (RCA) and giving recommendations to the department for repairment and sending the results to the director. This procedure is almost the same as what is

applied in government referral hospitals. There is a difference in the process of forming teams to conduct the RCA, and in this hospital the RCA team is formed by the director based on the basis of reports from the quality team. Subsequent variations can be found in private hospitals and this hospital incident reporting system starts with reports from all health workers addressed to the space coordinator. The room coordinator is in charge of validating and reporting to the hospital quality team. The hospital quality team analyzes incident reports and draws conclusions, the next process is the same as the procedure in the previous private hospital. The next variation is the procedure for reporting incidents at regional government hospitals, reporting starts from oral reports or in a written form from all health workers, and the space coordinator's task is to capture the report to the head of the room at the same time to obtain the approval of the report. Then the report is sent to the hospital quality team. The next process is the same as the report analysis process in a private hospital.

#### *Reporting Officers*

The organization has a policy on incident reporting procedures, including accessible rights to report incidents. The variation of accessible rights to report incidents has two significant parts: first is the employee and the second is the patient families who are given the right to report to the system [6].

Junior doctors are at the forefront of services to patients, but reporting incidents by junior doctors is still relatively low compared to nurses. This is due to feelings of fear of being blamed, lack of knowledge about reporting procedures, lack of knowledge about incident definitions, lack of reporting procedures, feedback systems, and team failures in analyzing incidents [14].

The results of a review of incident reports in several type B hospitals in the Special Region of Yogyakarta, Indonesia outline that patients or families and non-health workers have not been able to report the occurrence of suspected incidents. Most nurses report what has occurred in the ward, and all health workers are given accessible rights to the report. This reporting culture must be built with the support of all parties in the hospital. The results of interviews at the private hospital prove that education system is developed by providing accessible rights to all staff in the hospital including cleaning staff. This decision-making is inspired by the interesting story of the incident in the ICU, which was finally discovered because the janitors removed electricity in the room connected to the cleaning equipment used.

#### *Fill in Incident Report Data*

The standard policy of incident report data in various countries is regulated as needed. Broadly speaking, it tells about the time and description of the incident occurred. Anonymity is one alternative to increase the number of incoming incident reports. Contents of incident reporting data include the description of events (5 W + 1 H), results of a report analysis, reporter's identity, and patient identity [7]-[9] The researchers found additional variations in the



contents of the incident report data such as the identity of the person who committed the incident [7]; recommendations for preventative measures [7] [9]; medical record of the last treatment episode and data of the treating physician [8].

In the incident reporting application, facilities are provided to facilitate the analysis of incidents. Some facilities are added in the form of a probability table of occurrence of incidents, severity, and risk grading matrix. Risk grading is obtained from multiplying the frequency of events with the impact of risk [9].

The results of observational studies show incident reports in several type B hospitals in the Special Region of Yogyakarta, Indonesia, and the contents of incident reporting refer to existing guidelines. In fact, some hospitals modify contents. In private hospitals, patient identity data are not included in the incident report. This confidentiality of patient data and the quality team focuses more on solutions and preventive efforts for the second event. Computerized incident reporting systems present information on the number of events and trends concerning the types of incidents. Private hospitals are specialized in modifying the contents of incident reports, namely types of incidents, patient identities, reporting unit, Doctor in Charge of DPJP Care (DPJP), place of incidents, name of the reporter, date of incidents, name of staff involved, chronology of events (details of events and corrections of actions made), the impact, proposed preventive measures, validation by the responsible nurse and head of installation/section, incident data analysis, corrective action plans (actions, start date and end of investigation), analysis by the quality team.

#### *Incident Reporting as a Team Learning Process*

The incident reporting culture was successfully built over the past ten years and it was carried out within cultural changes to punish or look for those who made mistakes in the system platform that might need a review [10].

The smallest possible error monitoring system and errors-related comprehensive treatment prove to be the most effective way of improving patient safety by focusing on preventive strategies [8] [9] [11]–[15].

The interview results with the hospital quality and patient safety teams in Yogyakarta outline some facts that they tried not to blame or punish staff, but to carry out investigations, so that they find a system to show improvements. For example, cases in the late administration of drugs by nurses to inpatients that obviously occur because the nurse is exhausted after working for 2 shifts in a row. It is the staff scheduling system that results in the incidence of patient safety. As a solution, there is an improvement in the scheduling system along with a policy of not allowing staff to work in two consecutive shifts.

#### *Efforts to Improve the Incident Reporting Culture*

Factors supporting the implementation of an incident reporting culture in education hospitals include eliminating gaps in terms of the staff education, binding legal rules, good communication, effective reporting, and communication between leaders and education practitioners [17].

To familiarize the incident reporting culture from an early age, WHO released the concept of learning related to incident reporting as a basis for introducing and evaluating errors due to human factors [18]. The purpose of the reporting system is to maintain patient safety, protect students at work, and control students' behaviors. This system is mainly concerned with students who fear and feel threatened for the behaviors they have [16]. As this system was developed using an online open access portal, staff, students and public users can report incidents. The system offers the form of positive feedback, security and warning systems in a professional manner. The reports types are categorized into the completion plan that covers three levels: level 1 (next 2 weeks), level 2 (1 week ahead), and level 3 (next 24 hours) [16].

In addition to preparing resources at the education level, it is necessary to increase the role of junior doctors at the hospital level by applying the incident reporting culture. Junior doctors play a role in incident reporting, and it is necessary to measure the incident reporting culture for junior doctors through: (1) assessing the knowledge and trust of junior doctors in the reporting system; (2) selecting an important clinical area as the focus of incident reporting; (3) providing motivation for 1 week related to the incident area at the specified focus; and (4) evaluating the experience of junior doctors in reporting incidents [14]. To maintain the knowledge of officers about incident reporting, evaluation is managed by carrying out survey methods [19].

The same perception about the definition and scope of the incident needs to socialize, so that standard reporting is worth obtaining. This key component can be applied to create an optimal incident reporting system, namely entering the data to support a patient's safety culture, a detailed description of incident events, analysis of data with time and expertise to make the learning system, and incident report feedback [15]. Reporting incidents is insufficient to improve patient safety, and efforts have to be made to develop an incident reporting system by prioritizing convenience factors, implementing a patient's safety-based management, and action to solve problems as a guide toward the system improvement [10].

Austria developed a culture of reporting patient safety incidents supported by existing sanctions and confidentiality policies. This is an attempt to increase the number of reporting [6]. Efforts to improve the obstacles in implementing the reporting culture are carried out both internally and externally. Internal factors deal with increasing issues of the organization and staff in developing a reporting culture. External efforts provide input, so that incident reporting materials are an integral part of education and training components, accreditation programs, and the existence of institutions that support patient safety activities [12].

Commitments from all parties are required to build a reporting culture. An effective electronic reporting system, motivation, training, improved communication, and establishing a culture of incident reporting are synergistic



elements in applying a patient safety culture. Training sessions to improve the quality of reporting can provide materials in the form of understanding the contents of incident reporting data [7]–[9] including ways to report, to access reporting systems, to enter data on the system, and the definition of patient safety incidents [9], describe the type of incident, incidence of severity, and analysis of the causes of the problem [8] [19]. An analysis of incident causes is mainly concerned with the Root Cause Analysis (RCA) method [19].

Efforts to improve the culture of incident reporting have obviously been made in several type B hospitals in the Special Region of Yogyakarta, Indonesia, aiming to create easy and effective reporting innovations according to the input from users in each hospital. Innovations in private hospitals and education hospitals are in the form of electronic incident reporting systems developed by the team using assignments from the director. Special private-owned hospitals make reporting innovations by modifying the reporting format and giving staff the freedom to report according to the ability of the reporter (the report will be completed by the head of the room). The education hospital innovates an incident reporting system electronically, while the description of incidents is reported in a manual form. Government referral hospitals try to get input from users for the development of an electronic incident reporting system. In contrast to the regional level hospitals, efforts are made to improve the culture of incident reporting by appointing a reporting team from each ward in the hope that this team will report incidents in each ward.

#### *The Development of Incident Reporting Systems*

Manual incident reporting systems have limitations including errors, and inaccuracies in reporting [8]. The development of an electronic incident reporting system is integrated with an electronic medical record system. The number of incidents is reported when the manual system is less effective, for example, errors and inaccuracies in the data may occur. Based on manually collected reports, there are as many as 62 incidents. This number has doubled to 128 incidents reported on electronic systems [8]. This proof shows the ease of reporting systems that can increase the interest of officers in reporting incidents.

The aim of developing a system of patient safety incident reporting in the form of computerization is to gain experiences from previous cases, find solutions to new cases, and reduce the likelihood of the same recurring incidents [21]. The incident reporting application provides an easy reporting system and incident analysis with facilities for incident probability tables, incident severity, and risk grading matrices [9].

The development of incident reporting systems starts from the preparation stage, determining system features, feedback and analysis, and the socialization stage system [15]. The preparation stage includes: (1) the dissemination of the system approach; (2) starting from small incidents, experiences, and broadly scopes; (3) getting support from financial resources and managers; (4) determining the scope of initial activities; (5) preparing special officers to initiate reporting incidents; and (6) avoiding the overlap of the existing system and preparing the stages of application. The second step is to plan system features in incident reports by taking into account: (1) standardization of terms used; (2) providing the sample of solution facilities on the system database; and (3) providing a brief and clear incident reporting form. The feedback and system analysis stages mainly cover: (1) Database systems to provide a warning signal of similar incidents; (2) sending feedback from the results of report analysis; and (3) an expert advisory team analyzes reports and provides recommendations for improvements. The fourth stage disseminates the results of the analysis involving: (1) the provision of continual education to officers; (2) the engagement of expert speakers to provide recommendations, and (3) the publication of recommendations [15].

To facilitate the development of an incident reporting system, it is compulsory to take heed of the following stages of incident data collection and the feedback process. Attractive procedures can increase the motivation of officers to collect incident reports desirably. Algorithms are set to build databases that facilitate processing and analysis of incidents by expert teams. The element of confidentiality and the accuracy of the data format is strongly complicated considerations in building an incident reporting system database. The system interface attracts users to focus on an accepted and executed system capital. Feedback is conveyed to users to get enlightenment as a follow-up material [21].

As a central part of the system development rules, electronic reporting of patient safety incidents is built on the web, database server, server management facilities, user authentication, and network security along with a firewall provision. Interestingly, this database server facility offers an automatic backup function when officers start entering data on the system [8]. The incident reporting system was developed online by considering the ease of input and the accuracy of information that needs to describe the details of incidents that occur, making it easier to carry out the analysis of the root of the problem [7]. In Table 1. a variation of the patient safety incident reporting system can be used for consideration.

**Table 1: A Variation of the Patient Safety Incident Reporting System**

Sources	Countries	Servers Application	DBMS	Technology Applications
(Jang, Choi and Kim, 2017)	Korea	1. Microsoft.NET Framework 4.0 2. Windows Server 2008 R2	Microsoft SQL 2008 R2	1. Microsoft Visual Studio 2012 2. WCF 3. WPF 4. Component One 5. Infragistics 6. Cristal Report
(Kanda, 2011)	Japan	1. TurboLinux Server 6.1 2. Server Web Apache	PostgreSQL	-
(Reed et al., 2014)	Spain	-	Web-based Microsoft Access database	-

The strength of an electronically incident reporting system is that it can retrieve the patient information from electronic medical records, making it easier to complete the patient history data. The reported data on the system include names, medical record numbers, patient conditions, causes of incidents, follow-up steps, and other relevant actions. A manager has the right to verify the staff's reporting system. A staff member has accessible rights to search for reports, revise reporting data, and delete pending reports. Managers have accessible rights to view all reports that enter the system, choose, and save them as registered reports of the patient safety team. This team has accessible rights to open reports the managers had registered and write key determinants and other opinions in the reports for the sake of suggestions or improvements [8].

The system evaluation is carried out after 10 months of application to get users' ratings regarding quality, users' satisfaction, health anxiety, and individual impacts [8]. For educational purposes, evaluation of incident reporting system can be processed after two months of implementation to obtain reported incident data and system facilities [19]. The application of incident reporting in the emergency department can be evaluated after 14 months of system implementation. Evaluations using survey methods include two parts, namely the frequency of incident events and the reporters' knowledge of the incident reporting system [19].

At present the development of an incident reporting system at a government-owned referral hospital has not reached the design stage, but the quality team has had a candidate name for the created system. The choice of this name is easy to remember and reflects the incident reporting system. The plan to develop an incident reporting system at regional government hospitals for the time being has not developed an electronically incident reporting system, but it will develop an electronic-based reporting system to facilitate incident data input using computers, androids, and telephones. In addition, the

officer added that the system would be developed using a security system such as a password and user name.

*Challenges for Implementing an Incident Reporting Culture*

Doctors including staff report the least incidents compared to other staff. On the other hand, incidents reporting system from doctors has a relatively high level of relevance for patient safety [10].

In addition to resources, another challenge is the role of the organization in implementing a reporting culture, for example, the blame and tendency to refuse the root cause analysis. The system focuses on mistakes, embarrassments, and blames that must be abandoned immediately. The new paradigm is applicable in that an incident occurs due to a system error (system failure). The basis of developing this paradigm is that humans have limitations, so they can make mistakes even though the organization has been managed well, or known as making mistakes is human (to err is human) [14].

The inhibiting factors for the incident reporting process include fear of punishment, feelings of lack of trust in efforts to improve the patient safety after the reporting process, lack of knowledge about incidents reporting systems, and the presence of concerns about increased workload [8] [19]. In addition, lack of feedback is also a limiting factor for reporting. In general, this research classifies two factors that inhibit the implementation of incident reporting, namely organizational and individual factors [12]. The number of incidents caused by the presence of fatigue from individuals, meaning that incidents can be prevented [7]. Most incidents that occur in perioperative cases occur due to human failure, such as non-compliance with procedures, forgetfulness, errors, and lack of communication between teams [9].

The research results of interviews with the quality team in several type B hospitals in Yogyakarta show that the challenge to implement this incident reporting culture includes staff who understand events or incidents of patient safety and the interest of officers to report incidents.



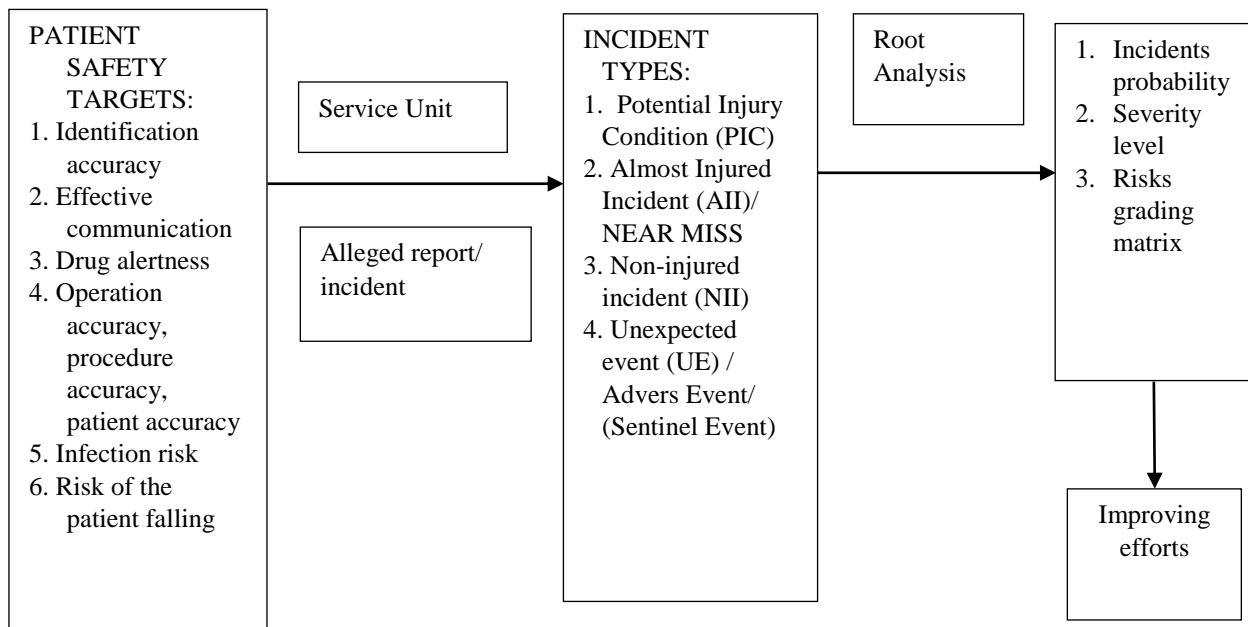


Fig 2. A Scheme of Patient Safety Incidents Reporting System

### Discussion

Reports on incidents of patient safety are important data to provide information on improving patient safety quality. This article explores a variety of incident reporting systems through which reviews of journal articles aim to find out updated information about patient safety incident reports. The research presents the results of studies in several type B hospitals in Yogyakarta, Indonesia in addition to information that has not been written in other articles. This paper is a preliminary study on a reporting culture of incidents and the patient safety in hospitals.

The research results of several journals recommend an effective reporting system to support all staff. Standardization of type definitions and terms in the incident reporting needs to be periodically disseminated to get perceptions. Understanding the focus of patient safety goals, definition of incident types, and the reporting flow as summarized in the system of reporting schemes (Figure 2.), and it is a step to begin implementing the culture of incidents reporting.

Electronic incidents reporting systems can increase the incident reporting [8] [12]. This reporting system offers convenience and effectiveness of data input for officers who will report. In addition, the quality team delivers services through the help of root cause analysis and presentation of information on reporting profiles of incidents in terms of the patient safety in hospitals.

### CONCLUSION

Referring to the review results of articles in the PubMed database followed by comparison of the results of preliminary studies in several Type B hospitals in the Special Region of Yogyakarta, a patient's safety incident reporting culture can be applied involving all hospital staff and effective reporting facilities that can increase the number of incoming reports.

This facility also benefits the patient safety quality team, because it can facilitate the process of analyzing incidents data and presenting information based on the results of incident reporting.

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Photo

**First Author** personal profile which contains their education details, their publications, research work, membership, achievements, with photo that will be maximum 200-400 words.

Author-2  
Photo

**Second Author** personal profile which contains their education details, their publications, research work, membership, achievements, with photo that will be maximum 200-400 words.

Author-3  
Photo

**Third Author** personal profile which contains their education details, their publications, research work, membership, achievements, with photo that will be maximum 200-400 words.

