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Compliance of the Nurse for Fall Risk Assessment as a Procedure of Patient Safety: A Systematic Review

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Abstract

Fall is an incident that is often reported in hospitals. Fall can result in a loss to the patient. Fall risk assessment is an operational standard procedure that becomes a part of the performance and behaviour of the nurses. The aim of this study is to find out the level of compliance of the nurses in assessing the risk of fall in hospitalized patients. This study uses systematic review based on the Prisma Protocol. A search was conducted on electronic databases ProQuest, Scopus, and Google Scholar using relevant keywords. The relevant studies were further selected using inclusion and exclusion criteria. Twelve studies were included in this review. Five studies were conducted in wards, one study in emergency room, and six studies did not specifically mention the place. All studies show that nurses are already quite obedient in doing the standard operational procedure but there are still many nurses who do not do the fall risk assessment. The compliance of the nurses are influenced by the assessment instrument Morse scale, socialization of the operational standard procedure by the supervisor, level of education, age, work experience, and team work. As conclusion, the compliance of the nurses in assessing the risk of fall in patients is getting better. The most important factor is the availability of assessment instrument.

Keywords: fall, fall risk assessment, nurses' compliance, patient safety, Morse scale

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1. Introduction

The hospital as a health care provider must consider and ensure patient safety. The hospital is an organization with high risk of incidents involving patient safety caused by human error. Mistakes regarding safety most often caused by human errors, and these are caused by the failure of the system in which the individual works [1]. Some of the cases resulted in death and serious injuries were caused by not evaluating the risk of falling. Falling is the incident that is often reported, almost 20–30% of the overall

patient safety incidents report. A study conducted by the University Health System Consortium in 2003 for 18 months showed that there were 13% cases involving falls compared to other patient safety incidents [2].

Falls can lead to various kind of injuries, physical and also psychological damage. The most feared event of physical damage is hip fracture. Other fractures that often occurs after a fall are wrist, arm, and pelvis fracture, as well as soft tissue damage. The psychological impact include shock after falling and fear of falling, which lead to anxiety, loss of confidence, restrictions in daily activities, and falafobia or phobia of falls [1]. Another effect is the prolonged length of stay and escalated patient care cost, which increase potential harm to the patient and the hospital. The risk of falling can also reduce the patient's trust in the hospital.

In the implementation of patient safety programs in hospitals, the incidence of falls is one indicator of the program. Defining falls also has its own challenges. MiakeLye (2013) in the National Database of Nursing Quality Indicators defines a fall as 'an unplanned descent to the floor with or without injury' [3]. Meanwhile, WHO defines a fall as 'an event which resulted in a person coming to rest inadvertently on the ground or floor or some lower level'.

Nurses are professionals who play an important role in the functioning of the hospital. This is based on the number of nurses as the largest segment in the hospital [4]. In carrying out its functions, a nurse is the staff who have the most contact with patients (24 hours continuously). Nurses are also part of a team, in which there are a variety of other professions such as doctor [4]. Nurses should implement patient safety and concern when providing nursing care to the patients. Nurses must also involve cognitive, affective, and action that promotes patient safety [1]. Perception of the nurses to maintain the safety of the patient is important in the prevention and control of patient safety. The extent of the role of nurses allows the risk of errors and service.

The behaviour of nurses who do not maintain patient safety contributes to patient safety incidents. Nurses who do not have an awareness of the rapidly deteriorating situation fail to recognize what is happening and ignore important clinical information, and thus threaten patient's safety [1].

To start building a culture of patient safety, one of which is fall prevention, can be started by performing a standard operating procedure for fall risk assessment. Fall risk assessment can be done at the beginning and also periodic reassessment, including the potential risks associated with drug administration schedule and taking action to mitigate all the risks that have been identified [5].

The fall risk assessment can be carried out since the patient begins to register (within 24 hours since inpatient admission) by using a fall scale. Fall risk assessment should be multidimensional, consisting of medical, physiological, and behavioural aspect of the patient [6]. Fall risk assessment scale that has proven effective in reducing the risk of falls is the Morse Fall Scale for adult patients humpty dumpty scale for paediatric patients [7].

Fall risk assessment by nurses are part of the performance and behaviour of nurses in working according to their duties within the organization, usually associated with compliance [3]. Compliance is the level of someone in implementing a rule in the recommended behaviour. Another definition, Compliance is obedience or disobedience to the commands and the starting point of a change in attitude and behaviour of individuals. Several studies suggest that nurses lack an understanding of patient safety culture and have bad compliance with fall risk assessment. Based on the aforementioned introduction, this study was conducted in order to determine the level of nurses' compliance with fall risk assessment.

2. Methods

This study used a systematic review based on the Protocol Prisma. The literature search was conducted on October 10 to October 19, 2016. Restriction of the search includes the availability of complete and articles.

2.1. Search process

The search focused on electronic databases by using remote-lib.ui.id website. We did a search on ProQuest, Scopus, and Google Scholar. On ProQuest, we entered the advanced search page and entered the keyword 'Assessment' AND Fall Risk. With these keywords we obtained 257.883 journal, then we narrowed our search by limiting the studies conducted in 2010 to 2016 and the results obtained were 11.803. On Scopus we used keywords Compliance AND Assessment, reducing patient falls and found 103 journals. We focused our search on studies in 2012 to 2016 with a total of 36 journals.

On Google Scholar we used keywords Nurse AND reducing patient falls, resulting in 18 journals. Then we conducted search with keywords *kepatuhan perawat DAN risiko jatuh*, and found 52 journals. Total journal obtained on early identification stage is 11.909. After identification we conducted initial screening by reading the titles and

TABLE 1

Journal Parameter	René Schwendimann*1,2, Hugo Bühler1, Sabina De Geest1,3 and Koen Milisen3, (2006)	Huey-Ming Tzeng Chang-Yi Yin (2008)	Hesti Oktaviani (2015)	Rene Schwendiman, Hugo Buhler, Sabina De Geest, Koen Milisen	Elizabeth Ari Setyarini, Lusiana Lina Herlina	Tini Ariyati, Raharjo Apriyatmoko, Heni Hirawati Pranoto
Title	Falls and consequent injuries in hospitalized patients: effects of an interdisciplinary falls prevention program	Nursing's solutions to prevent inpatient falls in patient rooms	Correlation between nurses' knowledge and the nurses' obedience to the implementation of the standard operating procedure (SOP) of patient fall risk prevention in Panti Waluyo Surakarta Hospital.	Falls and consequent injuries in hospitalized patients: effect of an interdisciplinary falls prevention program	Nurses' compliance with implementation of standard operating procedure: patient fall risk's prevention in Yosef 3 Dago Building and Surya Kencana Borromeus Hospital	Correlation between nurses' characteristics with compliance with implementation of patient safety procedure in ward II Prof. dr. Soerojo Psychiatric Hospital, Magelang.
Method	Serial survey design	In this qualitative study, researchers used inductive and deductive methods to understand the clinically accessible solutions to minimize the extrinsic risk factors of inpatient falls.	Descriptive observational with cross sectional approach	Survey, cohort	Descriptive quantitative cross sectional, observational of the implementation patient fall prevention	Descriptive correlation with cross sectional approach.
Variable	The population under study included adult patients, hospitalized in the departments of internal medicine, geriatrics, and surgery.	Nurses	a. 65 nurses b. Nurses who have standard operating procedure (SOP) of patient fall risk prevention knowledge c. Nurses who implement the standard operating procedure (SOP) of patient fall risk prevention	The incidence decrease before and after the Interdisciplinary Falls Prevention Program (IFP)	1) Assessing the MFS 2) Putting on wrist bracelets 3) Putting on the fall prevention pins (triangular red or yellow label) on the bed board 4) Write the patients at fall risk on the whiteboard 5) Lowering the bed 6) Ensure the safety rail bed in installed state in order to prevent the risk of falls	Categorical variables including age, education, marital status, years of training, and nurses' compliance with implementation of patient safety procedure were analysed using frequency and proportion of each variable.

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Analysis	Administrative patient data and fall incident report data from 1999 to 2003 were examined and summarized using frequencies, proportions, means and standard deviations and were analysed accordingly	The findings from the nurse interviews were compared with the intervention strategies towards the five primary root causes of fatal falls as suggested by the Joint Commission (2005b).	There were 65 nurses as samples. Sampel yang digunakan sebanyak 65 perawat. The analysis was done using Spearman rank correlation.	Frequency distributions and summary statistics including proportions, means, and standard deviations were utilized to describe patient characteristics, the prevalence of patient falls and associated characteristics across hospitals departments and years	This study collected data by observation, which observer only observed the respondents and gave checklist in 'yes' column if respondent did the assessment and checklist in 'no' column id respondent did not do the assessment. The instrument used in this study was observational sheet.	Univariate and bivariate analysis

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Result	Overall, a total of 3,842 falls affected 2,512 (7.2%) of the hospitalized patients. From these falls, 2,552 (66.4%) were without injuries, while 1,142 (29.7%) falls resulted in minor injuries, and 148 (3.9%) falls resulted in major injuries. The overall fall rate in the hospitals' patient population was 8.9 falls per 1,000 patient days. The fall rates fluctuated slightly from 9.1 falls in 1999 to 8.6 falls in 2003. After the implementation of the IFP, in 2001 a slight decrease to 7.8 falls per 1,000 patient days was observed ($p = 0.086$).	Twenty-four solutions were identified from the nurse interview transcriptions: five were related to the dimension of inadequate caregiver communication, none was associated with the dimension of inadequate staff orientation and training, three were related to inadequate assessment and reassessment, 15 were associated with unsafe care environment, and one was related to inadequate care planning and provision	a. There were 48 nurses (69.2%) who had enough knowledge of patient fall risk prevention standard operating procedure (SOP). b. There were 36 nurses (55.4%) who had compliance with implementation of fall risk prevention standard operating procedure (SOP).	**Frequencies of in-patient falls** total of 3,842 falls, (71.8%) patients fell once, (17.5%) fell twice, and (10.7%) fell three times or more. **Severity and type of injuries and evolution over time** 66.4% remained without injuries, while 29.7% falls resulted in minor injuries (pains, bruises, scratches, haematoma, superficial wounds), and 3.9% falls resulted in major injuries **Evolution of patient characteristics from 1999 to 2003** The proportion of female patients increase from 52.7% to 54.2% ($p = 0.235$) The mean age of the patients increased from 66.2 ± 19.2 years to 67.8 ± 19.2 years ($p < 0.001$) the mean nursing care time per patient increased from 3.4 ± 1.4 to 3.7 ± 1.4 hours per day ($p < 0.001$)	1) Assessing the MFS Almost all of the respondents were obedient to assess the MFS, 49 persons (98%). 2) Putting on wrist bracelets Nurses' compliance with use of bracelets was 68% and it was 34 persons. 3) Putting on the fall prevention pins (triangular red or yellow label) on the bed board There were 34 persons (68%) who complied to put on the fall prevention pins. 4) Write the patients at fall risk on the whiteboard There were 29 persons (58%) that wrote the patient s at fall risk on the whiteboard. 5) Lowering the bed There were 31 persons (62%) who comply to adjust the height of the bed. 6) Ensure the safety rail bed in installed state in order to prevent the risk of falls Almost all of the respondents, 48 persons (96%), did ensure the safety rail bed in installed state	The nurses' compliance with implementation of patient safety procedure was 51.3%. Correlation between age and the nurses' compliance with implementation of patient safety procedure with p-value 1.0

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Discussion	If clinicians adherence to the intervention protocol was inconsistent, it remains unclear if this can be explained by a lack of commitment on the part of the physicians and the nurses, by insufficient knowledge about which patients were at risk for falling, or whether the high priority given to the acute care treatment of patients contributed to the multifactorial falls risk modification protocol being neglected. The clinicians may not have been adequately prepared and facilitated to integrate the intervention protocol into their daily routine and, therefore, no sustained change of the clinical practice was established.	A hospital can be a dangerous and erratic place for inpatients because of its unfamiliar physical environment (different from their home settings) and because of changes in patients' medical conditions as related to their physical and psychological health and sensory systems (e.g., pain). A better physical facility design may lead to better health care outcomes, such as fewer patient falls in acute care hospitals	In this study, almost all of the nurses in Panti Waluyo Surakarta Hospital had a good compliance with standard operating procedure of fall risk assessment using Morse scale. This is proven by the majority of nurses already performed Morse scale's standard operating procedure. This was affected by many factors such as education level, age, and duration of work.	Following the implementation of the IFP, no reduction of in-patient fall rates and no reduction in consequent injuries were observed within individual departments or in the hospital. The mean length of hospital stay decreased slightly, while the mean nursing care time per patient day increased. The prevalence of risk factors for falls increased significantly Overall fall rates per 1,000 patient days (e.g., 8.9 falls) were higher compared to other studies reporting rates between 2.7 and 4.1 falls per 1,000 patient days	1. Assessment of MFS score 2. Use of fall risk bracelet 3. Installation of a red triangle 4. Writing the MFS score on the whiteboard 5. Lowering the height of the bed 6. Installation of safety bed rails	Of the six goals of patient safety, nurses' highest level of compliance is obtained in implementing right procedures, right location, and right patients procedures (61,5)

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Conclusion and suggestion	Following the implementation of an interdisciplinary falls prevention program, neither the frequencies of falls nor consequent injuries decreased substantially. Future studies need to incorporate strategies to maximize and evaluate ongoing adherence to interventions in hospital falls prevention programs.	A safety-driven design with a goal to prevent inpatient fall-related injuries should be a hospital design principle.	Conclusion from this study is that there is a significant positive relation between knowledge and compliance of the nurses in implementing patient fall risk prevention standard operating procedure (SOP)	Following the implementation of an interdisciplinary falls prevention program, neither the frequencies of falls nor consequent injuries decreased substantially. Future studies need to incorporate strategies to maximize and evaluate ongoing adherence to interventions in hospital falls prevention programs.	a. MFS assessment b. Use of fall risk bracelet c. Installation of red triangle label d. Writing MFS score on the whiteboard e. Lowering the height bed f. Installation of safety bed rails	There is no association between age and compliance with implementation of patient safety. There is association between work experience and compliance with implementation of patient safety. There is no association between marital status and compliance with implementation of patient safety. There is no association between level of education and compliance with implementation of patient safety. There is association between training and compliance with implementation of patient safety. Suggestion Regular evaluation to determine the availability of equipment and the extent of knowledge and skills of nurses to be able to have good compliance.
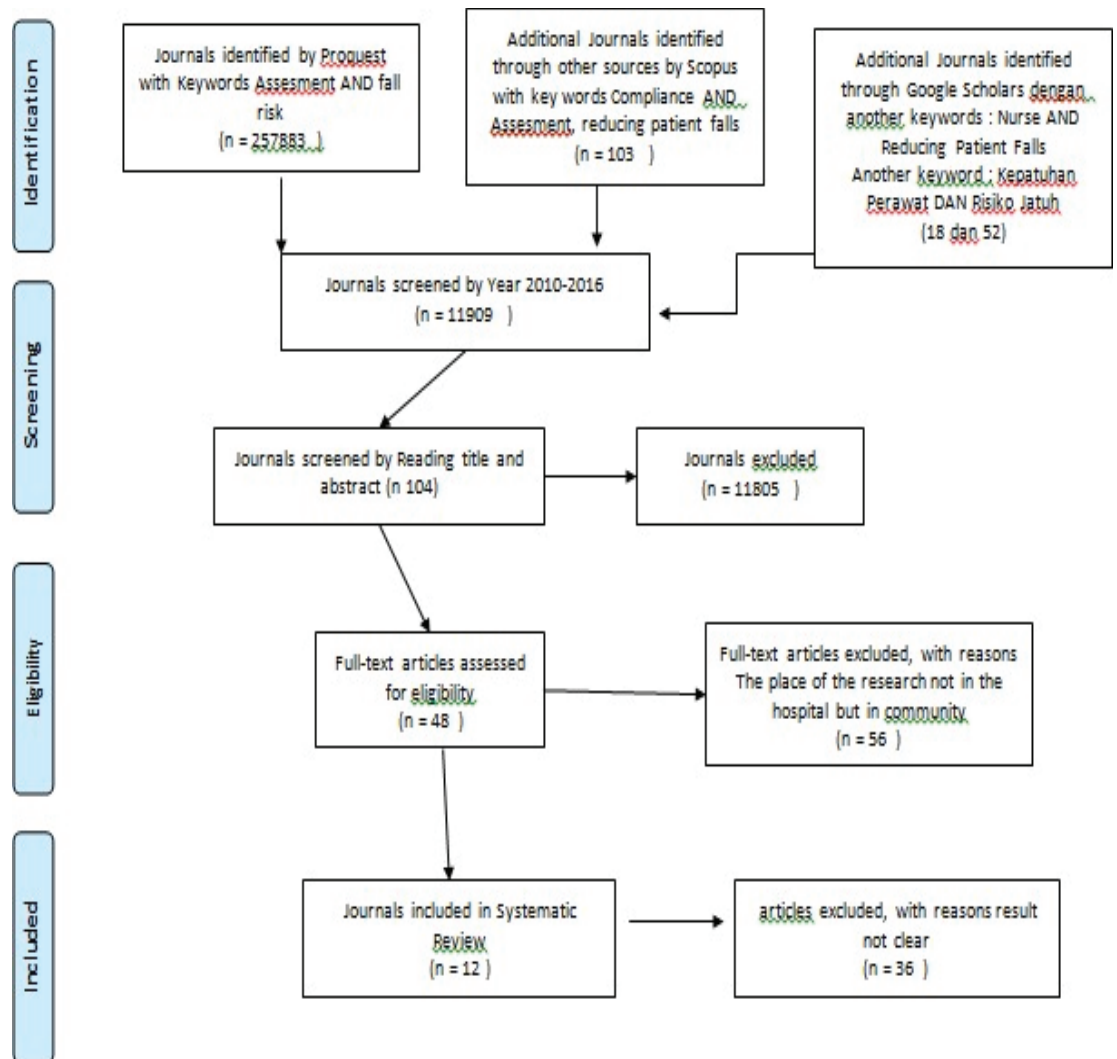
Figure 1: PRISMA protocol.

abstracts, we divided the result of the screening to all five authors. In the initial screening we managed to remove 11.805 journals and left only 104 to be proceeded.

At eligibility stage, 104 journals divided evenly to five authors in which the authors used inclusion and exclusion criteria. Exclusion criteria includes studies conducted in the community instead of in the hospital such as in elderly group. Inclusion criteria include studies related to the topic of nurses' compliance with fall risk assessment in hospital and the factors affecting such compliance. In this stage we obtained 12 journals.

3. Results

Nurses' compliance with fall risk assessment from twelve journals systematic review, five studies were conducted in wards, one study in emergency room, and six studies did not specifically mention the place. From all of these studies, the nurses is getting better in compliance with fall risk assessment.

The systematic review done by Hesti showed 10.8% of the nurses had bad compliance, 33.8% had adequate compliance, and 55.4% had good compliance. The nurses who had bad compliance were related to their knowledge of risk of falling. The knowledge of fall risk was 69.2% and it was considered good enough [3].

The study done by Setiowati showed 36.7% nurses did not assess the risk of falling and 63.3% assessed the risk of falling. The study conducted in Santo Barromeus Hospital in Bandung done by Setyarini et al. concluded that 98% of the nurses assessed the risk of falling in hospitalized patients using Morse scale, 58% of the nurses had good compliance with writing assessment results on the whiteboard at the nurse station and 42% had bad compliance [8].

According to Suparna, 50% of the nurses had good compliance with fall risk assessment and 68.75% of the nurses implemented the fall prevention in patients [1].

Study done by Schwendimann et al. showed that management program for risk of falling, which include fall risk assessment, could lower fall incidence by 15.3% in one year observation period.

Study done by Tini Ariyati et al. showed 51.3% had good compliance with fall risk assessment and 48.7% had not [9].

4. Discussion

In analysing this systematic review we found that nursing care to patients, especially patients at risk of falling, was good enough. It is proven by most of the nurses who already did fall risk assessment using Morse scale by the standard operating procedure [3]. Nurses' compliance is also greatly assisted by the Morse scale. Morse scale can be used to predict patients at risk of falling because it consists of six risk factors – history of falling, second diagnosis, walk assistance, parenteral therapy, gait, and mental status [7]. According to Schwendimann, Morse scale is sensitive and specific for predicting falls. It is easier for nurses to focus on fall risk assessment with an adequate instrument [6].

Nurses' compliance is also affected by many things. Nurses who have good compliance with fall risk assessment are influenced by some factors, including level of education, age, and work experience. Nurses who have received socialization or understanding about fall risk assessment using Morse scale tend to be better than the nurses who have not been socialized before [3]. Study done by Setyarini stated that the fall risk assessment was socialized by the division head and patient safety team of Santo Barromeus Hospital so the nurses had good compliance with fall risk assessment, but the division head as a supervisor must improve the ability to supervise regarding to the principles and technique of supervision [10]. The supervisor also need to build a good cooperative relationship with the nurses and it will develop with good communication.

Age is also one of the factors that affects nurses' compliance with fall risk assessment. Seniors are more likely to have poor compliance with fall risk assessment using Morse scale and tend to assess based on patients' dependency [3].

Study done by Hesti showed that nurses' knowledge is related to compliance with fall risk assessment. Nurses who have a good knowledge in fall risk assessment always have good compliance, but on the other hand they also found nurses with lack of knowledge about fall risk assessment so the implementation of fall risk assessment was not optimal. This is due to lack of training and evaluation of the risk of falling using Morse scale.

Nurses perform the fall risk assessment as a nursing care routine, it causes the performance to assess or compliance with assessment to decrease. To overcome this problem, we need to create a conducive environment at work to anticipate being saturated at work. Saturation at work can be minimized with a proper staff development and fulfilment of equipment for nursing care. Staff development can be done with an opportunity to continue their formal education and training. And for the fulfilment of the equipment consists of tools to facilitate patient care or tools for self-protection in high risk exposure to disease transmission and hazardous drugs.

In contrast to saturated work factor, study done by Alvarez said that nurses' satisfaction rate with work environment was not related to the compliance with fall risk assessment [11].

The other factor that affect the fall risk assessment is teamwork. The disruption in teamwork can affect the compliance with fall risk assessment [4]. Besides that, the compliance is also affected by the burden of care that must be done by the nurses in accordance with the number of patient at that time (hours per patient day or HPPD). The lower the HPPD or the higher the number of patients is associated with high incidence of falls in hospitalized patients [12], so the nurses' competency is necessary

to be prepared to face the condition of patient loads. Adequate staff, either in number or skills are essential for quality care.

In the end, nurses who have good compliance with fall risk assessment will help themselves to identify patients at risk of falls and taking security measures in these patients.

5. Conclusion

Nurses' compliance with fall risk assessment in hospitals shows a better change than before. The compliance is influenced by the Morse scale instrument. Morse scale is very effective in helping nurses to conduct fall risk assessment. Nurses' compliance is also affected by many factors such as level of education level, age, work experience, training, supervision from division head or head room and also by the workload itself.

Based on the systematic review, authors have a few suggestions:

1. Hospitals should use Morse scale as an instrument for fall risk assessment.

2. Training and review are needed to improve nurses' compliance with fall risk assessment.

3. Standard operating procedure needs to be regularly updated to prevent patient safety incidents.

4. Head nurses is required to evaluate the fall risk assessment.

5. Regularly conduct an analysis on the workload of the nurses and continuously conduct staff development activities.

This study in systematic review is limited in assessing the risk of falling for adult patients using the Morse scale instrument. The authors have not found literature that explains the fall risk assessment for paediatric patients using Humpty Dumpty scale instrument that has a multidimensional element.

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