

## Factors influencing pediatric nurses' compliance with risk of falls prevention standards to achieve patient safety at Wonosari Hospital Special Region of Yogyakarta

Anita Widiawati<sup>1,2</sup>, Alida Lienawati<sup>1,3</sup>, Siti Nurunnayah<sup>1\*</sup>

<sup>1</sup>Alma Ata Graduate School of Public Health, Faculty of Health Sciences, Alma Ata University  
Jalan Brawijaya Road no 99. Tamantirto, Special Region of Yogyakarta

<sup>2</sup>Rumah Sakit Umum Daerah Wonosari  
Taman Bakti Road no 6. Purbosari, Wonosari. Gunung Kidul

<sup>3</sup>Dr. YAP Hospital  
Cik Di Tiro Road. No.5. Yogyakarta

\*Corresponding author : [nurunnayah.siti@almaata.ac.id](mailto:nurunnayah.siti@almaata.ac.id)

### ABSTRACT

**Background:** The incidence of fall risk for inpatient pediatric patients increased from 2022 to 2023. The incident is a serious problem and has an impact on child morbidity and mortality. The incident occurred due to a lack of evaluation of nurses' compliance with efforts to prevent the risk of falls in hospitalized children. Several studies have been conducted to determine the factors that affect nurses' compliance with fall risk prevention standards, such as education, attitude, motivation, workload and work environment factors but have not been carried out systematically on all of these factors and have not been implemented specifically for pediatric nurses.

**Objectives:** This study aims to find out what factors most affect nurses' compliance with fall risk prevention standards in hospitalized children at Wonosari Hospital.

**Methods:** This study uses a cross sectional approach. The population is 86 respondents of nurses that holding care in pediatric rooms. Samples were taken using the total sampling technique. Compliance, knowledge, attitudes, motivation, workload and work environment measured by valid and reliable adoption questionnaire with calculates  $r > \text{table } r$  and Cronbach's alpha  $> 0.70$ .

**Results:** The results show that the  $p$  value of  $< 0.05$  There is a relationship between knowledge, attitudes, motivation, workload, and work environment to comply with the prevention of the risk of falling. The most influential factor on nurses' compliance is the motivation factor, was shown to have an odds ratio value of 83.444 followed by knowledge factors (OR=58.164), attitude (OR=4.064), workload (OR=0.626), and work environment (OR=0.085).

**Conclusions:** There is a relationship between knowledge, attitudes, motivation, workload and work environment to compliance with the risk of falling in hospitalized children. Motivation is the most influential factor in nurse compliance, It is hoped that the management of the hospital, will evaluate programs to prevent the risk of falling in hospitalized children

**KEYWORD:** *compliance; nurse; preventive; risk of child fall; hospital*

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## INTRODUCTION

Patient safety in the hospital is the main foundation of safe and comfortable services for the sake of creating healing for patients (1). Research shows patient safety can affect patient satisfaction (2). In the process of providing services, health problems are still found that can harm patients so that they cause injuries to patients (3). A patient safety incident, hereinafter referred to as an incident, is any accidental incident and condition that results in or has the potential to result in an injury that can actually be prevented; (1) Sentinel Event, an untoward event that causes death or serious injury (2) Unexpected Events, incidents resulting in injury to patients (3) Non-Injury Incident incidents that have already occurred to the patient but did not cause injury (4) Near Injury Incident, incidents that have not been exposed to the patient (5) Potential Injury Conditions, conditions that have the potential to cause injury but have not yet occurred (6).

Harvard Global Health Institute has been reported that unsafe care is responsible for the loss of 64 million disability-adjusted life years each year across the globe (4). Patient harm during the provision of healthcare is recognized as one of the top 10 causes of disability and death in the world. Meanwhile,

in the United States, it is reported that 700,000 to 1,000,000 people experience falls every year. In Indonesia, the incidence of patient falls is among the top three hospital incidents and ranks second after *medicine errors*, data shows that there are 34 cases of patient falls or equivalent to 14% of fall incidents in hospitals in Indonesia, this is still far from the standard of hospital accreditation. According to hospital accreditation standards, the incidence of patient falls in hospitals is expected not to occur (0%) (4). The Hospital Patient Safety Committee explained that there were 137 patient safety incidents in several provinces in Indonesia from January 2018 to April 2019. Based on the type of event, of the 137 incidents, 55.47% were Unexpected Events, 40.15% KNC, and 4.38% other events, 8.76% resulted in death, 2.19% *irreversible injuries*, 21.17% *reversible injuries*, and 19.71% minor injuries (5).

Based on the number of patient safety incidents, hospitals are encouraged to implement a system that functions to reduce falls and reduce injuries due to falls and the impact caused by falls on patients (6). Regulation of the Minister of Health No. 11 of 2017 concerning patient safety and hospital accreditation standards on patient safety

targets in the sixth assessment element, it is explained that there must be regulations that regulate the prevention of patients from injuries due to falls in hospitals. The hospital carries out the initial assessment process, follow-up assessment, re-assessment of inpatient patients based on the identified records of fall risk and continues to efforts to reduce the risk of falls (7).

Nurses have a role in preventing falls in hospitals through efforts to assess the risk of falls in patients. The implementation of the initial fall risk assessment takes place when the patient enters the hospital for a systematic examination and identification of nursing problems in the patient within 24 hours (8). Nurses carry out an initial assessment of fall risk using a child fall risk assessment instrument based on seven assessment items, namely age, gender, diagnosis, cognitive impairment, environmental factors, response to surgery or sedation, and the use of medication received by the patient (9,10). Nurses' compliance in implementing standard to prevent the risk of falls can affect the implementation of patient safety in hospitals and reduce the number of patients in pain due to falls (4). However, the implementation of fall risk assessment is still rarely carried out due to the workload of nurses who have to provide care to many patients in the treatment room. In addition, fall risk assessment is associated with knowledge, attitudes, and facilities in the nurse's work environment (11). The study explained that there is a relationship between

knowledge and compliance with patient safety procedures (12), so that the need for training on patient safety (13). However, other studies have shown that the understanding of fall risk does not guarantee that nurses comply with the implementation of fall risk (14). Mappanganro 2020 stated that motivation and facilities affect nurses' compliance in identifying the risk of falls in pediatric patients (15). Adequate facilities such as good lighting levels, non-slip floor surfaces, bed heights and bed safety are supporting factors in reducing the incidence of falls in patients. Other research also shows that nurse attitudes and motivation are a predisposing factor for realizing nurse compliance behavior. Attitude is a tendency that comes from within nurses to be professional in caring for patients in order to provide nursing services that will have an impact on patient safety services (16). Motivation, Workload and Work Environment affecting nurses compliance with patient safety standard (17).

Compliance with fall risk prevention efforts is included in the quality dimension, namely Standar Operating Procedures (SOPs) for initial fall risk assessment, fall risk reassessment, and monitoring and intervention to prevent fall patients. *In-house training* (IHT) on patient safety goals was carried out, but the duration of the training was lacking and the material was less specific to discuss SOPs for efforts to prevent the risk of falls. The implementation of clear and effective SOP is very important to reduce the

risk of falls and ensure the safety of hospitalized children at Wonosari Hospital. This SOPs includes preventive measures, identification of risk factors, and quick and appropriate handling in the event of an incident, thereby creating a safer environment for children in hospitals when receiving inpatient services. Socialization and supervision of nurses' compliance with SOPs to reduce the risk of falls has not been carried out optimally.

A preliminary study conducted by researchers at Wonosari Hospital obtained data that the number of cases of patients falling in 2022 amounted to 8 cases that occurred in 7 adults with the Unexpected Events category and 1 child who was included in the Non Injury Events category, while in 2023 there were 27 cases of fall incidents that occurred in 12 adults and 15 incidents in children who were included in the Non Injury Events incident category as many as 8 incidents. Near Injury Events as many as 2 incidents, as many as 4 incidents and Non Injury Events as many as 13 incidents. This shows that there has been an increase in patient safety incidents related to the risk of falls in patients from 2022-2023.

Nurses have a very big role in efforts to prevent the risk of falls, especially in children, because nurses have a long time with patients, compared to other medical personnel. One of the roles of nurses is carried out by complying with SOPs to prevent the risk of falling on children. Nurses' compliance with SOPs to prevent the risk of

falling on children, what factors affect them and which is factors more influencing has never been measured systematically, so it cannot be known.

Based on the above background and in order to be able to overcome it, it is necessary to conduct research on what factors affect the level of compliance of nurses in carrying out SOPs to prevent the risk of falling in children at Wonosari Hospital. This research aims to find out what factors most affect nurses' compliance with fall risk prevention standards in hospitalized children at Wonosari Hospital.

## **MATERIALS AND METHODS**

This study uses a quantitative design with a *cross sectional approach*. The population is 86 nurses on duty in the inpatient room that deals with pediatric patients. Samples were taken using *the total sampling technique*. The research was conducted in April-August 2024 at Wonosari Hospital. The dependent variable in this study is nurses' compliance with standards. Independent variables are knowledge, attitude, motivation, work environment and workload of nurses. The study used 6 types of questionnaires, namely knowledge questionnaires, attitude questionnaires, motivation questionnaires, workload questionnaires and work environment questionnaires as well as nurses' compliance questionnaires with SOPs. The questionnaire is a questionnaire adopted from previous research and has been tested for validity and reliability in

Yogyakarta hospital with *calculates r > table r* ( *table r=0.361*) and *Cronbach's alpha reliability result > 0.70*). The following is an explanatory table of the questionnaire.

The collected data has been statistical-ly tested with pearson correlation test and linear regression analysis. This research has received ethical approval from the Health Research Ethics Committee of Wonosari Hospital with number 33/KEPK/RSUD/V/2024.

**Table 1. List of questionnaire used in this study**

Name of Questionnaire	Adopted from	Items of Questions
Knowledge Questionnaire	Faridha, 2019 (18)	20
Attitudes Questionnaire	Inesia Ayudhita, 2022(19)	10
Motivation Questionnaire	Dian Mardiani,2018 (20)	10
Workload Questionnaire	Erima Elizar, 2019 (21)	10
Work Environment Questionnaire	Imam maulana, 2020 (22)	9
Compliance Questionnaire	Wonosari Hospital (23)	25

(17.4%).

**Tabel 2. Characteristic of respondent at wonosari hospital (n=86)**

Characteristic	f	%
Sex		
Male	5	5.8
Female	81	94.2
Age		
17-25 Years Old	7	8.1
26-35 Years Old	38	44.2
36-45 Years Old	27	31.4
46-55 Years Old	12	14
56-65 Years Old	2	2.3
Education		
Diploma	74	86
Graduate/Profesin al nurse	12	14
Length of Work		
<=5 Years	22	25.6
>5 Years	64	74.4
Work Unit		
Amarilis	13	15.1
Anggrek	10	11.6
Dahlia	13	15.1
Kana	3	3.5
Melati	16	18.6
NICU	16	18.6
Wijaya Kusuma	15	17.4
Total	86	100

## RESULTS AND DISCUSSION

### RESULTS

**Table 2** shows that, most of the respondents are female (94.2%) and the majority are aged 26-35 years (44.2%), with the most education being Diploma (86%) and most of the respondents have worked  $\geq 5$  years (74.4%) and the distribution is in the wards of Amarilis (15.1%), Orchid (11.6%), Dahlia (15.1%), Kana (3.5%), Jasmine (18.6%), NICU (18.6%) and Wijaya Kusuma

The results **Table 3** showed that nurse respondents who had knowledge in the good category were mostly compliant in preventing the risk of falls, namely 39 respondents (73.6%).

The results **Table 4** showed that nurses who had attitudes in the positive category were mostly compliant in preventing the risk of falling, namely as many as 32 respondents (65.3%).

**Tabel 3. The relationship between knowledge factor and fall risk prevention at wonosari hospital (n=86)**

Knowledge	Fall Risk Prevention Compliance		Total	$r^2$	p-Value
	Compliance	Not-Compliance			
Good	39 (73.6%)	14 (26.4%)	53 (100%)	0.455	0
Less	7 (21.2%)	26 (78.8%)	33 (100%)		
<b>Total</b>	46 (53.5%)	40 (46.5%)	86 (100%)		

**Table 4. Relationship between attitude and fall risk prevention at wonosari hospital (n=86)**

Attitude	Fall Risk Prevention Compliance		Total	$r^2$	p-Value
	Compliance	Non-Compliance			
Positif	32(65.3%)	17(34.7%)	49 (100%)	0.263	0.011
Negatif	14(37.8%)	23(62.2%)	37(100%)		
<b>Total</b>	46(53.5%)	40(46.5%)	86(100%)		

The results **Table 5** showed that nurse respondents who had high motivation were mostly compliant in preventing the risk of falling in pediatric patients, namely 37 respondents (77.1%).

The results **Table 6** of the study showed that nurse respondents who felt a workload in the light category were mostly compliant in preventing the risk of falling, namely 23 respondents or 69.7%.

**Table 5. The Relationship between motivational factors and compliance to prevent fall risk at wonosari hospital (n=86)**

Motivation	Fall Risk Prevention Compliance		Total	$r^2$	p-Value
	Compliance	Non-Compliance			
High	37(77.1%)	11(22.9%)	48(100%)	0.469	0
Low	9(23.7%)	29(76.3%)	38(100%)		
<b>Total</b>	46(53.5%)	40(46.5%)	86(100%)		

**Table 6. Relationship between workload factors and fall risk prevention compliance at wonosari hospital (n=86)**

Workload	Fall Risk Prevention Compliance		Total	$r^2$	p-Value
	Compliance	Non-Compliance			
Heavy	23(43.4%)	30(56.6%)	53(100%)	0.248	0.017
Light	23(69.7%)	10(30.3%)	33(100%)		
<b>Total</b>	46(53.5%)	40(46.5%)	86(100%)		

**Table 7. The Relationship between work environment factors and fall risk prevention at wonosari hospital (n=86)**

Work Environment	Fall Risk Prevention Compliance		Total	$r^2$	p-Value
	Compliance	Non-Compliance			
Tinggi	30(63.8%)	17(36.2%)	47(100%)	0.222	0.035
Rendah	16(41.0%)	23(59.0%)	39(100%)		
<b>Total</b>	46(53.5%)	40(46.5%)	86(100%)		

**Table 8. Factors affecting fall risk prevention compliance at wonosari hospital (n=86)**

Factors	B	p value	Odds Ratio	IK 95%	
				Lower	Upper
Knowledge	4.063	0.001	58.164	8.562	395.111
Attitudes	1.402	0.108	4.064	0.736	22.452
Motivation	4.424	0.001	83.444	10.007	695.804
Workload	-0.469	0.558	0.626	0.131	3
Work Environment	-2.46	0.015	0.085	0.012	0.616
Constant	-4.034	0.001	0.018		

The results **Table 7** showed that respondents who felt that the work environment was in the good or high category were mostly compliant in preventing the risk of falling, which was as many as 30 respondents (63.8%).

The results **Table 8** showed that the motivation factor had the greatest influence on nurses' compliance in preventing the risk of falls in children, which was shown by an *odds ratio* (OR) value of 83.444.

## DISCUSSION

Based on **Table 2** we know that the majority of respondents are women, this may happen because female nurses are more suitable for caring for children because of their nature that tends to be gentle on children. The majority are in young adulthood,

indicating that the respondents are mature people in age, and the majority have worked together for more than 5 years, indicating that the respondents already understand the rules that apply in the workplace. The majority of respondents with a real diploma education need to be encouraged to continue their undergraduate and professional education, because professional nurses have at least a bachelor's and professional education.

According to result in **Table 3** The results of the study also showed that respondents who had less knowledge in the category were mostly non-compliant in preventing the risk of falling, which was as many as 26 respondents (78.8%). Good knowledge about the prevention of fall risks greatly affects nurses' compliance in carrying out the necessary procedures (table 3).

Nurses who have adequate knowledge tend to better understand the importance of precautions, how to identify risks, and the steps to take to prevent falls, so nurses are more likely to adhere to existing protocols (15). This shows that lack of knowledge can contribute to non-compliance in implementing fall risk prevention measures. Nurses who lack knowledge are not fully aware of the importance of preventive measures or do not know how to apply them correctly, resulting in a higher risk of falls for pediatric patients.

In line with the above results, the study also showed that there was a significant relationship between knowledge and fall risk prevention in children, which was indicated by a *p-value* of 0.000 ( $p < 0.05$ ) with a positive correlation direction indicating that the better the nurse's knowledge, the higher the compliance with fall risk prevention in children. These results explain that nurses' knowledge is statistically related to nurses' compliance in preventing the risk of falls. The relationship between knowledge and compliance in the prevention of fall risk also showed 0.455 which explained a moderate correlation which means that knowledge is one of the factors related to compliance with the prevention of fall risk in children, but there are still other factors affecting nurse compliance (11).

Based on **Table 4** we know that the positive attitude that nurses have reflects their awareness, commitment, and responsibility for patient safety. In accordance with the direction of the positive correlation in

the statistical test of the study which explains that the greater the positive attitude shown by nurses, it will increase compliance in preventing the risk of falling in children. Nurses who have a positive attitude are more excited and motivated to implement fall risk prevention measures, understand the importance of such measures, and feel responsible for maintaining the safety of patients, especially children (18).

Respondents who had attitudes in the negative category were mostly non-compliant in preventing the risk of falling, namely 23 (62.3%). The negative attitude in this study reflects a lack of concern and apathy in efforts to identify the risk of falling. In line with research conducted by Saprudin 2021 which explained that nurses with a negative attitude do not see the importance of preventive measures or feel that these measures are impractical or too burdensome, so nurses tend to ignore existing protocols (11).

The results of the analysis also showed that there was a significant relationship between attitude and prevention of fall risk in children, which was indicated by a *p-value* of 0.011 ( $p < 0.05$ ). These results explain that the attitude of nurses statistically affects compliance in preventing the risk of falling in children. The relationship between attitude and obedience in fall risk prevention of 0.263 shows a weak but significant correlation which means that although attitude is a factor affecting compliance. In line with research conducted by Saprudin 2021 which shows that the relationship between nurses'



attitudes and compliance in identifying fall risks. Nurses who are proactive and responsive to the prevention of fall risks tend to be more thorough in implementing safety protocols, such as ensuring the use of bed safety, constantly monitoring children's activities, and educating families about preventive measures to create a safer and supportive environment for children who are prone to falls (11).

According to **Table 5** we know that high motivation in nurses greatly affects their compliance in carrying out fall risk prevention procedures (Table 5). Motivated nurses tend to be more dedicated and committed to carrying out their duties, including following patient safety protocols with more discipline and thoroughness. The results of the study also showed that respondents who had low motivation were mostly non-compliant in preventing the risk of falling, namely 29 respondents (76.3%). Low motivation can lead to a lack of initiative and attention to fall risk prevention measures. Nurses who have low motivation will feel less responsible or less interested in implementing preventive measures, thereby increasing the risk of falling incidents in pediatric patients.

The results of the statistical analysis also showed that there was a significant relationship between motivation and prevention of fall risk in children, which was indicated by a *p-value* of 0.000 ( $p < 0.05$ ). The relationship affinity also showed a figure of 0.469 which explained the moderate correlation where motivation had a strong

influence on nurse compliance, although there were still other factors that played a role such as knowledge, attitude, work environment, and nurse workload. The results of the analysis also showed a positive correlation direction where the higher the motivation of the nurses, the higher the risk of falling in pediatric patients. In line with research conducted by Mappanganro 2020 which explained that there is a positive relationship between motivation and compliance to prevent the risk of falling (15). Strong motivation encourages nurses to keep their knowledge and skills up to date, as well as to increase adherence to standard procedures, and strict supervision during child activities. In addition, intrinsic motivations such as the desire to provide the best possible care and a sense of professional responsibility increase the nurse's dedication in creating a safe environment for pediatric patients.

Based on **Table 6**, this shows that the lighter workload allows nurses to be more focused and meticulous in implementing fall risk prevention procedures. When the workload is not too heavy, nurses have enough time and energy to follow preventive measures more carefully, which can reduce the risk of falls on patients. On the other hand, respondents who felt that the workload in the heavy category were mostly non-compliant in preventing the risk of falling, which was as many as 30 respondents (56.6%) as 0,017 ( $p < 0,05$ )(17) (19)(10). In line with research conducted by Saprudin which shows that one

of the factors that affect compliance with fall risk prevention is the workload of nurses. Nurses who work under heavy stress will experience physical and mental exhaustion, which can affect their ability to maintain patient safety and well-being(11).

The results also showed that the close relationship between workload and compliance in the prevention of fall risk of 0.248 showed a weak correlation. The results explain that although workload is influential, there are still other factors that also affect nurse compliance. Another study explains that the factors that affect nurses' compliance in preventing the risk of falls are knowledge, attitudes, motivation, and knowledge (11). The study further explained that nurses who are overloaded with excessive tasks, attention to detail and vigilance in monitoring children's conditions may decrease, leading to an increased risk of falls. Heavy workloads often lead to physical and mental exhaustion, reducing the effectiveness of implementing safety protocols, such as continuous supervision and education to patients and families. The researcher argues that the management of Wonosari Hospital needs to pay attention to a balanced distribution of workload to ensure that nurses have sufficient capacity to prevent the risk of falls, especially in pediatric patients who require supervision.

The analysis from **Table 7** also showed that there was a significant relationship between the work environment and the prevention of fall risk in children, which was shown by a *p-value* of 0.035 ( $p < 0.05$ ) with a

positive correlation direction. The results explain that the better the work environment felt by the respondents, the higher the compliance with the risk of falling in children. The relationship between the work environment and compliance in the prevention of fall risk of 0.222 showed a weak correlation. This explains that although the work environment has an influence, there are still other factors that also play a role in determining nurse compliance. These factors can include knowledge, attitude, motivation, and workload. In line with research conducted by Fatonah 2023 which explains that a positive work environment, such as adequate staff, complete facilities, easy access to safety tools, and managerial support, allows nurses to focus on monitoring and the necessary interventions in accordance with SOPs (20). The study also explains that a collaborative work atmosphere and good communication between health team members increase vigilance and quick response to risky situations. Researchers argue that when nurses feel supported and work in a well-organized environment, nurses are better able to implement safety protocols consistently and effectively, thereby reducing the incidence of falls in pediatric patients.

A good work environment plays an important role in supporting nurses to carry out their duties optimally. A conducive work environment, showing nurses have access to adequate resources, support from colleagues and superiors, and a comfortable and collaborative work atmosphere, which can

encourage compliance with safety protocols, especially the prevention of the risk of falls on children. Other results also showed that respondents who felt that the work environment was in the low or bad category were mostly non-compliant in preventing the risk of falling, namely 23 respondents (59%). An unsupportive work environment can cause nurses to feel stressed, uncomfortable, and less motivated, which has an impact on a lack of compliance with fall risk prevention measures. Factors such as lack of facilities, conflicts between staff and poor leadership can exacerbate the situation that nurses are in (21).

Based on result from **Table 8**, this explains that respondents who have motivation in the high category have an 83 times greater tendency to be obedient in preventing the risk of falling compared to respondents who have motivation in the low category. High motivation can encourage nurses to carry out their duties more consistently in implementing measures to prevent the risk of falls. In line with research conducted by Mappanganro 2020 which explained that one of the factors that affect compliance in identifying the risk of falling in children is intrinsic and extrinsic motivation from nurses (15).

Intrinsic motivation includes aspects such as personal satisfaction, dedication to the profession, and desire to provide the best possible care, encouraging nurses to proactively adhere to safety protocols and stay alert to potential fall risks (22). Nurses

who are intrinsically motivated tend to be more eager to continue learning and developing skills, as well as being more thorough in carrying out their duties. The same is shown by extrinsic motivation, which includes financial incentives, professional recognition, and career development opportunities, can increase nurses' commitment to work and encourage them to work to a higher standard. Extrinsic incentives can improve compliance with safety procedures through rewards for good performance. Thus, a balanced combination of intrinsic and extrinsic motivation is needed to create an optimal work environment, where nurses are encouraged to do their best in preventing the risk of falling in children.

The knowledge factor also had a significant influence with an OR value of 58.164. A good knowledge of fall risk prevention allows nurses to understand the importance of such measures and how to do them correctly (11). Respondents who had adequate knowledge tended to be more obedient because they were aware of the consequences of the omission and had the necessary skills to prevent falls. Sufficient knowledge provides a basis for nurses to act effectively in prevention efforts. Another variable that affects is the attitude of nurses towards the prevention of fall risk, with an OR value of 4.064. A positive attitude towards patient safety can encourage nurses to be more committed to following prevention protocols. A good attitude reflects the awareness and concern of nurses for the

patient's well-being, which ultimately increases compliance in the implementation of fall risk prevention measures (11). The workload factor had a smaller influence with an OR value of 0.626. The light workload allows nurses to be more focused and meticulous in carrying out fall risk prevention tasks. Conversely, heavy workloads can lead to stress and burnout, potentially lowering compliance (19). The last variable, namely the work environment, also has a significant influence although it is smaller, with an OR value of 0.085. A good work environment can provide the necessary support for nurses, including adequate facilities, support from colleagues and superiors, and a conducive work atmosphere. When nurses feel supported and comfortable in their work environment, adherence to safety protocols tends to increase.

#### **CONCLUSION AND RECOMMENDATION**

Based on the results of the study, motivation is the most significant factor that affects nurses' compliance in preventing the risk of falls. Further research can be conducted with interventions to increase nurse motivation through various training programs and continuous career development can help increase nurses' intrinsic motivation, incentive programs, such as rewards for nurses who demonstrate high adherence to preventive procedures.

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