Factor Analysis of Early Warning System Documentation Implementation in Mental Hospitals

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Factor Analysis of Early Warning System Documentation Implementation in Mental Hospitals

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ABSTRACT

Introduction: An early warning system (EWS) is a tool to identify a patient's worsening condition as early as possible and improve the early treatment that helps nurses respond quickly to prevent unwanted events. However, the implementation and documentation have not been carried out optimally due to factors such as age, gender, education level, years of service, employment status, EWS training, shift arrangements, and workload. The purpose of this study was to analyze the factors related to the implementation of EWS documentation on patients in the mental care ward of Mental Hospital Dr. Radjiman Wediodiningrat Lawang. Methods: The study used a cross-sectional design and was analytically observational. The population of this study was all nurses in the intensive care unit, with a total sample of 60 respondents using a proportional random sampling technique. Analysis of the data using the chi-square test. Results: Implementation of EWS documentation is significantly related to the workload and EWS training that has been followed (p<0.05). Implementation of EWS documentation was not related to age, gender, education level, years of service, employment status, and shift arrangement (p>0.05). Conclusion: Nurses with light workloads and who have attended EWS training carry out documentation perfectly (100%). Hospitals need to review hospital management in carrying out planning, developing, and fostering nursing resources, especially the provision of continuous training accompanied by equitable EWS monitoring for nurses in Mental Hospital.

Keywords: EWS, implementation, nurses, factors, management

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INTRODUCTION

Nurses work to serve patients for 24 hours. Based on the Regulation of Menteri Kesehatan RI (2019) concerning the implementing regulations of law Number 38 article 36 of 2014 concerning Nursing, nurses have an obligation to document nursing care in accordance with standards. Errors in recognizing and responding to the worsening of the patient's condition will increase the risk of unexpected events (Mukhlishah Nurul Khair, Naharia La Ubo, 2019). If identified early and acted on quickly, it is estimated that it can reduce the worsening of the patient's condition. Therefore, many hospitals use the Early Warning System (EWS) to detect abnormalities and trigger the right response from staff (Dewi, Susila and Darmawan, 2020).

According to (Megawati *et al.*, 2021) said that 100% of the EWS documentation sheets in adult inpatient rooms are incomplete. The results

of the study of (Widegdo, Marti and Ratnawati, 2022), most nurses have not complied with doing EWS documentation. In addition, the results of the (Ratag and Kartika, 2021) hospital audit results show that there is inconsistent documentation of EWS implementation, which has an impact on the quality of hospitals that are at risk of patient safety.

Early Warning Score has been shown to increase Code Blue activation and decrease HCU (High Care Unit) admissions although there has been no significant difference in Net Death Rate (NDR) and Length of Stay (LOS) in studies with good EWS use at 22.81% (Hidayat, Agushybana and Nugraheni, 2020). Knowledge, attitudes, and compliance of nurses are required in applying EWS implementation skills competently. The application of the EWS Concept starts from the calculation of the score (scoring) of physiological parameters, reporting of scoring results, the implementation of the activation of the escalation plan to the documentation of the EWS score.

The results of a preliminary study that was conducted by researchers on January 12, 2020, at Mental Hospital Dr. Radjiman

Wediodiningrat Lawang by randomly observing in 3 different treatment rooms, obtained data that the implementation of EWS documentation with details of 60% was partially filled, 30% completely filled, and 10% not completed at all. Researchers also conducted interviews with nurses on duty in the room, most of those interviewed said the reason they hadn't/ didn't carry out EWS documentation was because they felt the workload was too heavy, so if they had to do EWS documentation correctly, they felt burdened. It should be noted that the average number of patients at Mental Hospital Dr. Radjiman Wediodiningrat Lawang is 35-36 patients in each room with a division of service if the morning service is guarded by 4 nurses, and if the afternoon/night is guarded by 2 nurses. For that reason too, nurses complain of being too heavy if they have to carry out complete EWS documentation.

There are many ways that can be done to improve the completeness of documentation, including EWS simulation tutorial training (Hapsari et al., 2021), monitoring and evaluation (Megawati et al., 2021), streamlining workloads and using electronic-based EWS documentation (Tobing, 2018) Based on the data above, researchers are interested in conducting research on "factors related to the implementation of EWS (Early Warning System) documentation in patients in the mental care room of Mental Hospital Dr. Radjiman Wediodiningrat Lawang".

METHODS

This research was a quantitative study using an observasional analitik research design and cross-sectional approach. The population in this study was 71 nurses from the Psychiatric Intensive Room of Mental Hospital Radjiman Wediodiningrat Lawang Malang. The total sample of 60 respondents was carried out using proportional random sampling techniques. Data collection using demographic questionnaires, workload questionnaires, and observation sheets for the implementation of Early Warning System documentation on patients through SIMRS. The data were analyzed using univariate and bivariate analysis. The univariate analysis in this study showed the distribution of age frequency, gender, education level, length of service, staffing status, experience in Early Warning System training, arrangements, workload, implementation of EWS documentation.

Meanwhile, bivariate analysis is used to determine the relationship between independent variables, namely age, gender, education level, length of service, staffing status, experience in participating in Early Warning System training, shift and workload settings, as well as dependent variables, namely the implementation of Early Warning System documentation. The data were analyzed using the chi-square test because it met the test requirements.

This research has passed the ethics test conducted in April 2020. The ethics test was conducted by the ethics committee of Mental Hospital Dr. Radjiman Wediodiningrat Lawang Malang. The result has obtained a certificate of ethics No. LB.02.03/XXVII.5.7/2301/2020. All nurses who became the respondents have also been informed of the purpose of the research conducted by researchers and been given written approval. The researchers also asked the respondents to give real answers.

RESULT

Table 1. Respondents' Characteristics in Psychiatric Intensive Room of Mental Hospital Radjiman Wediodiningrat Lawang Malang, 2020

Respondents	Total	Percentage
Characteristic	(n)	(%)
Age		
26-35 (early adult)	22	37
36-45 (late adult)	18	30
46-55 (early elderly)	20	33
Gender		
Man	42	70
Woman	18	30
Education level		
Associate Degree Nursing	32	53
Bachelor Degree Nursing	28	47
Period of service		
<6 years	10	17
6-10 years	11	18
>10 years	39	65
Employment status		
Civil servants	50	83
Contract employees	10	17
Experience EWS Training		
Ever	33	55
Never	27	45
Shift settings		
Morning service	31	51
Afternoon service	16	27
Night service	13	22
_		

Workload		
Heavy	13	22
Keep	30	50
Light	17	28
Implementation of EWS docu	umentation	
Implemented 100%	16	27
Partially Implemented	31	52
Not doing EWS	13	21

Univariate Analysis

Table 1 shows the characteristics of respondents based on age, gender, education, years of service, employment status, experience in EWS training, shift arrangements, and workload. Based on table 1 shows that most of the respondents (37%) were early adults, namely 26-35 years, and most of the respondents (70%) were male. Besides that, the educational background of the respondents was mostly Associate Degreei Nursing, which was 53%. Most of the respondents in this study had a working period of >10 years, which was 65%, almost all respondents (83%) were PNS employees, most of the respondents (55%) had attended EWS training, most of the respondents (51%) managed shifts morning service, and half of the respondents (50%) have a moderate workload.

Bivariate Analysis

Table 2 shows the results of cross-tabulation and the results of the bivariate analysis test with the chi-square test. Based on table 2, shows that the experience of attending EWS training has a meaningful relationship with the implementation of EWS documentation. This means that nurses who have received EWS training, carry out EWS documentation either partially (51.5%) or fully (45.5%) compared to respondents who have never received EWS training.

The workload is also a factor related to respondents carrying out EWS documentation. The results of this study showed that respondents who had a light workload were mostly (70.6%) carrying out EWS documentation in full or 100% compared to respondents who had moderate or heavy workloads.

The results of this study show that factors of age, level of education, gender, length of service, staffing status, and shift arrangements have no significant relationship with the implementation of EWS documentation.

Table 2. Bivariate Analysis of Respondents' Characteristics

	Implementation of EWS Documentation							ъ.	
Variable	Implemented 7 100%		Implemented partially		Not doing EWS		Total		P value
	n	%	n	%	n	%	n	%	
Age									
26-35 (early adult)	5	22.7	9	40.9	8	36.4	22	100	0.067
36-45 (late adult)	8	44.4	8	44.4	2	11.1	18	100	
46-55 (early elderly)	3	15.0	14	70.0	3	15.0	20	100	
Gender									
Man	11	26.2	25	59.5	6	14.3	42	100	0.074
Woman	5	27.8	6	33.3	7	38.9	18	100	
Education Level									
Associate degree Nursing	10	31.3	13	40.6	9	28.1	32	100	0.176
Bachelor Nursing	6	21.4	18	64.3	4	14.3	28	100	
Period of service									
<6 years	3	30.0	2	20.0	5	50.0	10	100	0.097
6-10 years	4	36.4	5	45.5	2	18.2	11	100	
>10 years	9	23.1	24	61.5	6	15.4	39	100	
Employment status									
Civil servants	12	24.0	29	58.0	9	18.0	50	100	0.082
Contract employees	4	40.0	2	20.0	4	40.0	10	100	
Experience EWS Training									
Ever	15	45.5	17	51.5	1	03.3	33	100	0.000
Never	1	03.7	14	51.9	12	44.4	27	100	0.000
Shift settings									
Morning service	4	12.9	17	54.8	10	32.3	31	100	0.079
Afternoon service	7	43.8	8	50.0	1	06.3	16	100	0.077
Night service	5	38.5	6	46.2	2	15.4	13	100	
Workload		5015		.5.2	-			.00	

Heavy	1	07.7	2	15.4	10	76.9	13	100	0.000
Keep	3	10.0	26	86.7	1	03.3	30	100	
Light	12	70.6	3	17.6	2	11.8	17	100	

DISCUSSION

Age relationship with Early Warning System (EWS) documentation implementation

The results of this study show that there is no meaningful relationship between the age of nurses and the implementation of EWS documentation. However, it is likely that adult nurses carry out more partial and full EWS documentation (100%) compared to older nurses. The results of the researcher's analysis, can be caused because in general the phase of adulthood or younger, a person is more receptive to a change, more manageable, and more energetic at work. Meanwhile, in the elderly, there are changes in the physiological functions of the body that can affect its motivation to work, causing the quality of performance to decrease. Based on Erikson's theory of development, young adulthood is a phase of an active individual in a career so that they are productive at work (Potter and Perry, 2015). However, based on the results of the study this is also in accordance with the results of the study of (De Groot et al., 2022), older people get more information so that they can improve their ability to document nursing.

The relationship between education level and the implementation of Early Warning System documentation

This study shows the absence of a relationship between the level of education of nurses and the implementation of EWS documentation. This is because respondents (53%) are educated in associate degree Nurseries. The Level of Education associate degree Nursing is an educational level with sufficient knowledge in providing service actions to patients, including the implementation of EWS documentation. In addition, most of the respondents who are educated in associate degree Nursing have a working period of > 10 years, so the length of service in the room can hone the ability of nurses to become professionals even though they have a associate degree Nursing Education level. However, the results of this study show that nurses who are educated with associate degree have a greater percentage of not carrying out EWS documentation than nurses who are educated in Bachelor Degree Nursing.

The researcher's assumption can be caused because Bachelor Degree Nursing education is required to work with professionals following new scientific developments and policies and does not work based on routine, but is able to evaluate and improve nursing actions. The undergraduate level of Nursing is a professional education level that has the role of a nurse manager, so it is required to be able to implement an early warning and risk control system that exists in the clinic and build an appropriate nursing management system (Wu et al., 2015). The results of the study by (Mayenti, Arif and Priscilla, 2020) show that the high education of nurses means that the nursing documentation carried out is more complete. Low education levels are a determining factor in low Health literacy, due to limited ability to access and understand Health information (De Groot et al., 2022).

Sex relationship with the implementation of Early Warning System Documentation

The results of the study showed no relationship between sex and the implementation of EWS documentation carried out by nurses. However, table 2 shows that the percentage of not carrying out EWS documentation is more done by women than men.

This can be because the number of male respondents in the Mental Hospital inpatient room is more than that of women. Male and female nurses have equal standing in terms of education and employment, so gender dominance and social inequality do not appear in the area of nursing work. Gender relations in nursing tasks place male and female nurses in equal standing. Male and female nurses are given the same rights and obligations, engage in the same profession, and perform the same duties, including in documenting the implementation of EWS. The results of the (Larjow and Lingner, 2022), show that female nurses are more obedient in documenting nursing duties completely. Meanwhile, the results of the study of (Langkjaer et al., 2021) show that female nurses have more experience in implementing EWS.

The relationship of service life with the implementation of Early Warning System documentation

The nursing tenure had no meaningful relationship in the study. However, this study showed that nurses with < 6 years of service did not carry out EWS documentation more than nurses with a service period of > 6 years. The period of service describes the experience of mastering its area of duty. As Sujalmo et al. (2022), most of the nurses expressed that the EWS implementation is difficult for them. During the focused group discussion (FGD) the participant expressed that the implementation is complicated and they were confused about how to apply the EWS. That implementation process is affected by various factors such as nurses' experience. Meanwhile, junior nurses do not have the ability to recognize the patient's aggravation and document it. This is due to the lack of knowledge and experience that such staff has. Nurses who have experience in detecting patient aggravation can immediately respond quickly. Staff experience is one of the important factors in conducting effective assessments and referrals.

The length of service or the length of time of obtaining information about EWS documentation and carrying it out in the room, is an important element in the ability to carry out documentation. According to the results of the study by Ang (2019), nurses in the intensive care unit implemented the electronic documentation system better after twelve (12) months compared to three (3) months after implementation.

The relationship of employment status with the implementation of Early Warning System documentation

This research study shows there is no meaningful relationship between staffing status and the implementation of EWS documentation. However, the results of this study show that most nurse contract employees do not carry out EWS documentation. This can be caused because civil servants are permanent employees of the mental hospital, where there have been many socialization activities and knowledge improvement activities that have been carried out for all employees, so there is motivation to carry out the duties that are their responsibility. Permanent employees can be more responsible and more focused in carrying out their duties compared to contract employees, because there is no thought about career or staffing status that can affect the performance of nurses.

The relationship of experience in participating in Early Warning System training with the implementation of Early Warning System documentation

The results of this study show a meaningful relationship between the experience of attending EWS training and the implementation of EWS documentation. Based on the results of Nantschev and Ammenwerth (2022), the experience of attending training can improve the knowledge and ability of nurses in assessing the correct clinical situation so that they can document complete and standardized nursing.

This study is in line with the research of Reyaan *et al.* (2022) conducted on 30 nurses across of nurses and midwives in an inpatient ward of a private hospital in Yogyakarta showed that there is a relationship between training (pvalue = 0.049) with the level of knowledge of nurses and midwives about EWS. The training aims to prepare employees who will soon be given the task of working as expected by the Institution. Training is an effort to transfer knowledge or skills to the trainees so that after the participants have finished receiving the training, it is hoped that the participants will be able to apply it while working.

The relationship of shift settings with the implementation of the Early Warning System documentation

This study shows that there is no meaningful relationship between the setting or type of nurse shift and the implementation of EWS documentation, as all nurses know the importance of documenting a patient's EWS while on duty. EWS is used to assess a patient's clinical condition and improve response in a timely manner. The main objective of EWS is to help nurses quickly recognize and react to the deteriorating patient (Sujalmo *et al.*, 2022).

According to Hwang and Kim (2022), EWS documentation is used during patient handover to improve patient safety. The use of NEWS2 enhanced handover quality, teamwork, and safety climate. Using NEWS2 to assess patient conditions may foster clear communication and understanding of the importance of patient information as a mutual agenda and provide an opportunity for cross-checking, thereby improving the quality of patient handover and teamwork.

However, table 2 shows that nurses with morning shifts have a higher percentage of not carrying out EWS documentation than nurses who are on the afternoon or evening service. This can be caused because the morning service at Mental Hospitals is the nurse's peak hours in carrying out nursing performance. In addition, it can also be caused by the limited number of nurses in the room. The results of this study are in accordance with the study of O'Neill et al. (2021) that the Perceived busyness of the ICU nurses discouraged participants from Rapid response team (RRT) activation. Participants noted that responding RRT members occasionally talked about how busy they were.

Workload relationship with Early Warning System documentation execution

Workloads have a meaningful relationship with the implementation of EWS documentation. The results showed that almost all respondents who had workloads in the heavy category did not carry out EWS documentation (76.9%). The results of this study are in line with the study conducted by Widegdo, Marti and Ratnawati (2022) that there is a workload relationship with nurse compliance in documenting the Early Warning System (EWS) with a p-value of 0.001.

The workload is important to know as a basis for knowing the work capacity of nurses so that there is a balance between nurses and workloads. The results of this study show a heavy workload, mostly not documenting EWS. In addition to nurses with moderate workloads, Most of the EWS documentation is done only partially or incompletely. According to the results of the study by Widegdo, Marti and Ratnawati (2022), the presence of a heavy or moderate workload can be influenced by the lack of nurses on duty compared to the number of patients treated, thus causing a workload felt by nurses. In addition, conditions require nurses to make efforts to rescue patients because of worsening conditions that occur suddenly so they require extra nurses to provide optimal services.

Factors that affect the workload of nurses such as external factors that are physical workloads such as an imbalance between the number of workers nurses with the number of patients and additional tasks (Megawati *et al.*, 2021). This statement supports research from Tamaka, Mulyadi and Malara (2015), that factors associated with higher workloads were presenting a higher number of diagnoses, and having worse functional status.

CONCLUSION

The implementation of the Early Warning Score (EWS) documentation has a meaningful relationship with the nurse's workload factor and the experience factor of attending EWS training. Nurses who have a light workload have mostly carried out 100% EWS documentation and nurses who have attended EWS training have mostly carried out EWS documentation. Meanwhile, the factors of age, gender, level of education, length of service, staffing status, and work shift arrangements do not have a meaningful relationship, but seeing the tendency from the results of this study can be used as input to handle these factors to improve the quality of service at Mental Hospital. it is expected that Mental Hospital socializes or conducts training for nurses in implementing EWS and documents it regularly. In addition, supervision is also needed to evaluate the ability of nurses to carry out EWS documentation. Implementing professional nursing care management in the room will be able to reduce workload so that it can carry out patient services optimally. Subsequent research can identify other factors that may relate to or influence the implementation of EWS documentation so that implementation barriers can be identified and addressed.

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