

Original Research

The Implementation of Early Warning Score for Early Detection of Death in Adult Inpatient Rooms



Wardah Fauziah^{1*} & Novian Mahayu Adiutama¹

¹Politeknik Negeri Subang, Subang, Indonesia

Article Info	Abstract
Article history: Received: 24 October 2022 Accepted: 29 November 2022	<i>Introduction:</i> The Early Warning Score (EWS) can be used to predict the likelihood of short-term and long-term death. It is associated with abnormalities in the condition of vital signs of patients who are at high risk of death, regardless of the intervention or timeliness of medical personnel. <i>Methods:</i> This research is an innovation for the management of Evidence-based practice-based nursing actions. It was conducted using quantitative research (quasi-experiment) using post-test design with control group. The populations were all hospitalized patients in the adult room of the Subang Hospital. <i>Results:</i> The result showed that the Gross Death Rate in the control group of 29 people with a percentage of 10.54% of the total number of respondents is 275. Then, in the intervention group, the GDR figure was a small percentage of 12 people with a percentage of 4.36%. Meanwhile, the Net Death Rate in the control group was 9 people with a percentage of 3.27%. In the intervention group, the number of NDR was small, namely 4 people with a percentage of 1.45%. <i>Conclusion:</i> Based on the results and analysis of statistical tests that have been conducted on the implementation of the application of Early Warning Score (EWS), it was found that the detection of early death intervention group is lower than the control group. Early Warning scores significantly decreased the GDR and NDR in the intervention group compared to the control group.
Keywords: early warning score, implementation, mortality	

*Corresponding Author:

e-mail: wardah.fauziah@polsub.ac.id



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INTRODUCTION

Nursing is one of the important parts of the hospital in providing continuous nursing care. Nurses and other medical teams are required to provide fast service because time is life (Time saving is life sparing) in critical nursing services. Nurses as implementers in providing nursing care must conduct a focused assessment and observation of imperative signs to assess and determine the risk of deterioration of the patient, detect and respond by activating code blue [1]. The use of Early Warning Scores (EWS) is closely related to the role of nurses who perform daily observation of crucial signs. Errors or unexpected events can be minimized with the application of (EWS) and the availability of facilities that support the implementation of patient safety in the world [2]. An early detection or early warning scoring system has been introduced to detect a worsening of the patient's condition with the implementation in the world [3]. It is an assistance request system to address patient health problems early. EWS is based on the assessment of changes in the patient's condition through systematic observation of all physiological changes in the patient so as to avoid unexpected events in the emergency room or Intensive Care Unit [4].

Hospital service standards are grouped based on patient safety goals, patient-focused service standards, national programs, and the integration of health education in hospital services [5]. One of the hospital accreditation assessments contains the application of early detection of changes in patient conditions using EWS [6]. It can be used to predict the

likelihood of short-term and long-term death. It is associated with abnormalities in the condition of vital signs of patients who are at high risk of death, regardless of the intervention or timeliness of medical personnel [7]. Public Health Centre as the first level health facility must be equipped with basic emergency service capabilities to support optimal health services system. [8] The implementation of EWS can be used as a predictor of a patient's clinical outcome including length of hospital stay, mortality within 28 days, and rate of readmission to intensive care [6]. The mortality rate is one of the indicators of the health care process which is classified into two categories, namely deaths under 48 hours and deaths over 48 hours which are assessed through indicators of Gross Death Rate (GDR) and Net Death Rate (NDR) [9]. The standard of patient mortality in hospitalization > 48 stick according to the negligible standard of hospital care is 0.24% [10]. In Indonesia, there is no exact information about the death rate in all hospitals. In one of the Indonesian hospitals, it was found that the GDR in 2016 showed 14.73 while the NDR value was 7.73, which means that it was still high above the minimum standard of hospital services [11]. Worsening of the patient may occur when the evaluation and implementation of EWS does not comply with the algorithm. This requires the medical team and nurses to have professional competence in monitoring, measuring, and evaluating the patient's condition. The results showed that the implementation of observing nurses based on EWS was not implemented 100% in accordance with the algorithm [12].

The implementation of EWS is done by applying EWS screening tools in the adult inpatient room of Subang district General Hospital. Currently, based on the results of observations and interviews with nursing staff, it has not been applied for the implementation of EWS. It needs to be implemented with the aim to reduce the indicators of Gross Death Rate (GDR) and Net Death Rate (NDR) mortality (death) of patients in Subang district General Hospital, so that the quality of nursing care can be improved and mortality in Subang Hospital can be reduced.

METHODS

This research is an innovation for the management of Evidence-based practice-based nursing actions. This study was conducted using quantitative research quasi-experiment with post-test design with control group. The population in the study were all hospitalized patients in the adult room of the Subang Hospital as many as 24724 people. Sample selection was conducted in Subang hospital. Researchers used Cohen's power and effect size method. The Effect Size in the previous study conducted by Wylde was 0.65. To achieve 80% power, the sample size in this study using $w=0.6$, $(1)=3$, and $(1)=0.05$.

The study was conducted from July-September 2022. The research place used was Subang hospital, West Java, Indonesia. The criteria of respondents in this study include respondents aged more than 17 years, treated in an adult inpatient room and willing to be respondents. Data collection tools in this study in the form of observation sheets EWS

consisting of breathing, oxygen saturation, breathing apparatus, temperature systolic blood pressure and level of consciousness. Then the observation sheet for the Gross Death Rate (GDR) and Net Death Rate (NDR). After the research and data collection stage is completed, the next stage is data analysis using SPSS software version 26.

The interpretation of EWS results is divided into three parts, namely low, medium, and high values. Low values have a score range of 1-4 indicating the result that it is necessary for the nurse to monitor changes in the patient's condition. Furthermore, the intermediate value has a score range of 5-6 which indicates that continuous monitoring by nurses and doctors is needed, and the team is prepared to deal with critical circumstances. Finally, a high score has a score range of more than 7 which indicates that rapid treatment is needed in an emergency from a team of nurses and doctors. The use of modified EWS as a means of early detection of the deterioration of the patient's condition is still rare in Indonesia. Ethics approval was obtained from the Indonesian Commission of Health Research Ethics STIKES YPIB Majalengka with the number (012/1263/141,107/2022).

RESULTS

Table 1 shows the Gross death rate in the control group of 29 people with a percentage of 10.54% of the total number of respondents as many as 275. Then, in the intervention group, the GDR figure was a small percentage of 12 people with a percentage of 4.36%. Meanwhile, the Net Death Rate in the control

group was 9 people with a percentage of 3.27%. In the intervention group, the number of NDR was small, namely 4 people with a

percentage of 1.45%. Based on Table 2 most of the respondents (89.81%) have a low EWS score.

Table 1

Gross Death Rate (GDR) and Net Death Rate (NDR) after the implementation of Early Warning Score (EWS)

Group of Respondent	GDR			NDR			95%	<i>p</i> ^a
	Yes		Total	Yes		Total		
	n	%	N	n	%	N		
Control	29	10,54	275	9	3,27	275	1,62	
Intervention	12	4,36	275	4	1,45	275	1,75	0,028

Table 2

Frequency distribution of EWS in the intervention group

Score EWS	Total	Percentage (%)
Low Score (1-4)	247	89.81 %
Medium Score (5-6)	16	5,83 %
High Score (≥ 7)	12	4,36 %
Total	275	100%

DISCUSSION

The Early warning score (EWS) can be used to predict the likelihood of short-term and long-term death. It is associated with abnormalities in the vital signs of patients who are at high risk of death, regardless of the intervention or timeliness of medical personnel. Early warning score (EWS) can be used as a predictor of patient outcomes including gross Death Rate (GDR) mortality in 28 days or Net Death Rate (NDR), and HCU/ ICU admission and code blue activation.

The EWS system was developed to reduce the length of treatment and mortality of patients, and this helps nurses improve their ability to recognize worsening patient conditions. NDR and GDR are important information in the hospital in evaluating care more than or equal to 48 hours in each time, including the quality of medical care and can be used to plan future health care, the indicator is compared with national standards. The national standard of the GDR is < 45 or < 4.5% per annum while the national

standard of the NDR is < 25% or < 2.5% per annum.

GDR figures from July to September in this study showed a decrease after the implementation of the Early Warning System in the intervention group compared with the control group. At the time of the study 4.36% in the intervention group. This figure has met the maximum standards because it does not exceed the GDR maximum standards set by the Ministry of Health as much as 45 %. The GDR figures illustrate that the services provided to patients during hospital stays have not been good. Many factors that influence the death such as, the severity of a disease, dexterity, and alertness of care services, as well as the accuracy of treatment, to be very concerned and influential. The instrument developed to be able to determine the patients who need to be monitored more intensively and determine the resuscitation measures that need to be done is the EWS [13]. The success of EWS in lowering the GDR or NDR number is influenced by the good implementation of the EWS instrument [14]. EWS assessment which includes checking blood pressure, pulse, respiratory rate, oxygen supplementation, in addition to awareness is carried out periodically by nurses in the inpatient room with the aim of detecting changes in the patient's condition early [15], [16]. The EWS value can determine the action to be performed and documented in the patient's medical record based on the applicable SPO [17].

In the intervention group there were 12 respondents who experienced a Gross Date Rate (GDR) of 0.43 out of 1000 deaths in hospital in the study period. Then the total

number of respondents who experienced mortality after >48 hours after treatment in hospital Net Death Rate (NDR) of all respondents in the intervention group was 1.75 %.

Based on the results in Table 2 most of the respondents (89, 81%) EWS value is low. Low EWS values indicate that nurses are needed to monitor changes in the patient's condition. Based on the results of the study, the cause of the low EWS value can be from various factors, among others, the room used in this study is an adult inpatient room, namely internal medicine, surgery, and nerves. Patients who are in the inpatient room are usually patients who are not in a condition of severity or criticality so that their EWS values can be low.

Meanwhile, the NDR figures in July to September in this study showed a decrease after the early warning system was implemented in the intervention group compared to the control group. At the time of the study 1.45% in the control group. Patients who die before receiving treatment 48 hours is assumed to come to the hospital already in severe pain, so it is possible the death of patients including not because of lack of quality medical services, but because it is the condition of patients who are already seriously ill [18]. NDR indicator better reflects the quality of medical services because only patients who die >48 hours, which means the patient has received medical services in the hospital [14], [19].

The EWS was developed to be able to determine which patients need to be monitored more intensively and determine what resuscitation measures need to be

carried out. The failure of EWS in reducing the incidence of cardiac arrest can be caused, among other things, by poorly performed implementation [20].

CONCLUSION

Based on the results of research and analysis of statistical tests that have been conducted on the implementation of the application of EWS. As the detection of early death, the intervention group is lower than the control group. The EWS significantly decreased the GDR and NDR in the intervention group compared to the control group.

CONFLICT OF INTEREST

There was no conflict of interest.

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