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Using Social Learning Theory in Training Nursing Use National Early Warning Score 2 (NEWS2)

La Thanh Hai[1], Do Van Dung[2], Ngo Thi Bich Nuong[1]
[1]Faculty of Medicine, Buon Ma Thuot Medical University, Vietnam
[2]Faculty of Public Health, University of Medicine and Pharmacy at HCMC, Vietnam
Email address: lthai@bmtuvietnam.com, dvdung@ump.edu.vn, ntbnuong@bmtuvietnam.com

***Abstract*— Introduction:** *The National Early Warning Score 2 (NEWS2) is recommended as a tool for identifying and classifying patients at risk of severe progression. Knowledge and attitudes about NEWS2 are essential for implementation in the practice of patient care in the Emergency Department.* **Objective:** *To determine the effect of a 22 lessons training program built on Albert Bandura's social learning theory of National Early Warning Score 2 on the knowledge, attitude and skills of nursing care in the Emergency Department in Tay Nguyen region General Hospital.* **Methods:** *A semi-experimental study conducted on 50 clinical nurses at the Emergency Department, Tay Nguyen region General Hospital was included in a training program using the National Early Warning Score 2. Data were collected using self-completed questionnaires to assess knowledge, skills, attitude, and intentions before and after the intervention.* **Results:** *After the intervention, the percentage of nurses with correct knowledge reached 98% compared to 36% at the time before training ($p<0.001$). The percentage of nurses with correct skills reached 96% after training compared to 34% at the time before training ($p<0.001$). The percentage of nurses with a positive attitude on the NEWS2 scale after intervention increased by 64.25 (reaching 84%). 89% of nurses intend to use the NEWS2 scale clinically.* **Conclusion:** *After implementing an education program on the National Early Warning Score 2 (NEWS2), nurses' knowledge, attitudes and skills regarding the NEWS2 scale have improved markedly. Positive attitude increased significantly. Intent to perform was high (89%).*

Keywords*—National Early Warning Score, NEWS2, social learning, knowledge, attitude, skills.*

I. INTRODUCTION

Rapid identification and classification of patients at risk of severe progression is a very important issue in accurately determining the treatment and care needs of patients, helping to improve treatment efficiency and save resources. health and social sector. In most cases, these severe clinical developments were preceded by warning signs. However, many studies show that pre-existing clinical signs are often missed or follow-up is not appropriate. Early recognition of clinical deterioration has been shown to be helpful in preventing the occurrence of clinical events. Rapid detection can reduce the number of patients treated in the ICU due to early and stable intervention.

Early Warning Score Systems (EWSs) were developed to help medical staff identify patients at risk of serious disease earlier. In 2012, the Royal College of Physicians introduced NEWS and NEWS2 updates in December 2017 to identify patients at risk of worsening [8]. NEWS2 has been proven to outperform other EWS in performance. Instructional programs for the use of EWS in general and NEWS2 in particular have been designed to assist healthcare professionals in recognizing and treating patients' worsening situations, with studies assessing their impact on knowledge and clinical effect have been made. In general, the knowledge and competence of clinical nurses improved immediately after different training programs. However, clinical nurses have limited access to the use of EWSs to detect early signs of deterioration in critically ill patients, which is largely based on personal experience. The cause may be due to the workload, clinical characteristics at the work unit or the needs of the nurse. At the same time, the lack of an adequate and effective training program can lead to a mismatched assessment of decision making by physicians and nurses [7].

With its proven advantages, the NEWS2 scale is suitable for training nurses to quickly identify and classify patients at risk for severe clinical progression and provide appropriate responses. NEWS2 knowledge, attitudes and skills are essential for the routine application of nurses in patient care.

II. OBJECTIVES

To determine the effect of a 22 lessons training program built on Albert Bandura's social learning theory of National Early Warning Score 2 on the knowledge, attitude and skills of nursing care in the Emergency Department in Tay Nguyen region General Hospital.

III. MATERIALS AND METHODS

A. Study Design

The semi-experimental study was performed on 50 volunteer care nurses participating in the Emergency Department.

A training program consisting of 5 theoretical periods and 15 practical periods is built on the National Early Warning Score 2 NEWS2 [8], including 4 corresponding stages of Social Learning theory [1]:

Stages 1 and 2: Create attention and Create retention (5 theory periods) by the method of illustrative presentations, short presentations, actively engaging students. Discussion and group work.

Stages 3 and 4: Creating a practice environment and Motivation (15 practice periods). Teaching-learning clinical practice at the Emergency Department, teaching-learning by clinical situations, real-life problems at the Emergency Department. Learning is based on observation of the senior

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nurse as a model. Self-study method, learning among learners. Lecturers inspire and motivate learners in the form of: encouraging, motivating, praising and rewarding individuals with good achievements. Learners draw their own hands-on experiences using the Improved Early Warning Scale (NEWS2).

The research team has compiled a manual for the use of the NEWS2 scale. To facilitate the understanding of the NEWS2 scale, we combine theoretical teaching with practice through built-in situations.

The person who conducts the training is the chief physician of the Emergency Department, the Tay Nguyen region General Hospital (with more than 15 years of experience in teaching and clinical emergency).

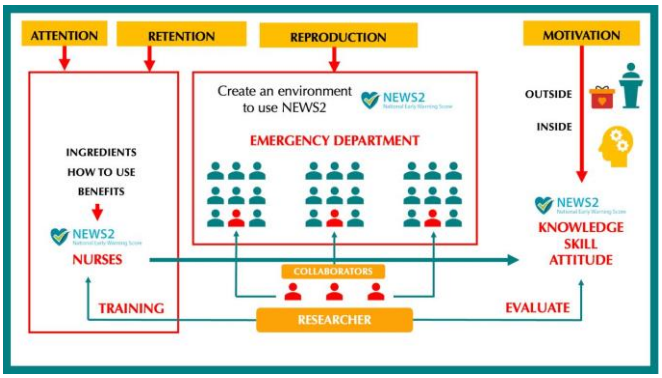

Fig. 1. Applying social learning theory for this study

B. Sample Size

50 nurses at the Emergency Department, the Tay Nguyen region General Hospital.

C. Data collection and analysis

Data collection

Notice of course content is sent to the Emergency Department. Nurses who agree to participate in the training program will be emailed the assessment content at the time of the pre-course assessment (T0), these contents will be re-evaluated immediately after the end of the training program (T0). T1) and after the 1 month training program (T2). The knowledge questionnaire is built based on the author Liswati [4] questionnaire which has been translated into Vietnamese version and consists of 2 parts: part 1 - 05 questions about general information, part 2: 50 questions about knowledge. General knowledge on the NEWS2 scale, the reliability of the knowledge questionnaire (KR-20) is 0.793. Assessment of skills using the NEWS2 scale of nurses through 5 hypothetical clinical situations to. Assessing the attitudes and intentions of nurses about NEWS2 with a set of questions developed by author Aline Richard et al., evaluated in Peng Lingli's study (2020) with Cronbach's α = reliability. 0.72, $p<0.05$ [11]. The reliability of the questionnaire on attitude and intention to perform is 0.82. The training program was built based on Albert Bandura's Social Learning theory to teach about NEWS2 for nurses, data was collected at 3 times: before training, right after training, after 1 month of training.

Analytical statistics

Using Friedman's test to test the difference in the median and interquartile range of knowledge, skills, attitudes and intentions to perform before and after training.

Using the paired Wilcoxon test to test the difference between the knowledge and skills of the research subjects before and after the intervention.

Using Mann-Whitney U, Kruskal-Wallis test to analyze the relationship between demographic variables and knowledge and skills of nurses before and after intervention.

Using the 95% confidence interval, $p<0.05$ is considered to be statistically significant

D. Approval

Research strictly complies with ethical regulations in biomedical research. The topic has been approved by the Ethics Committee in Research, University of Medicine and Pharmacy, Ho Chi Minh City, No. 788/HĐĐ-ĐHYD. Nurses completely voluntarily participate in the study and have the right to withdraw from the study when they do not agree to participate in the study. Personal information will be kept confidential.

IV. Result and Discussion

A. Characteristicss of the Participants

The age of nurses participating in the study was the most from 26 to 35 years old with a rate of 76%. Different from the study of Mohamed Naeem Badr et al (2021) who were 22 - 23 years old (66%) [6] and the study of Roshy Damayanti (2019) 54.8% were in the age group of 30 - 39 years old [3]. The percentage of female nurses is 6 times higher than male nurses (86% are female), consistent with statistics in the world and Vietnam showing that female nurses account for over 76%. This result is similar to the studies of the authors Shanmugavalli Janakaraj et al (2020) with the percentage of Females 92.3% [10], Wiles et al (2016) with the rate of females being 81% [2]. The education level of nurses participating in the study include Intermediate, College, and Bachelor of nursing. The percentage of intermediate nurses is almost similar to that of a Bachelor of nursing. College graduates accounted for the lowest rate at 22% (n=50). Different from the study of Mohamed Naeem Badr et al (2021) with 100% of nurses having a Bachelor of nursing [6]. This is similar to the situation of shortage of highly qualified human resources in Vietnam. The working seniority of the research group from 3 years or more accounts for over 88% (n=50), 7.3 times higher than that of the group with less than 3 years of seniority. Working experience in a long-term field not only makes the job convenient when facing many situations that need to be handled but also imparting experience and training to newly recruited employees is the purpose of the company. targeted recruiters. We assume that whether the nurse has had access to NEWS2 before or not, will affect the nurses' knowledge, skills, and attitudes towards NEWS2, so we collect more information about NEWS2 of nurses. This is different from previous studies when it comes to factors that increase knowledge and skills scores. The research results showed that 40% of the nurses knew about NEWS2 in various forms.

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TABLE I. Demographic characteristics of nurses participating in the study

Variable		No (n = 50)	Ratio (%)
Age	Under 36	38	76.0
	From 36 – 45	10	20.0
	Over 45	2	4.0
Gender	Male	7	14.0
	Female	43	86.0
Education level	Intermediate	19	38.0
	College	11	22.0
	Bachelor of Nursing	20	40.0
Seniority	< 03 years	6	12.0
	≥ 03 years	44	88.0
Information about NEWS2	Known	20	40.0
	Unknown	30	60.0

B. Effectiveness of training program for nurses using National Early Warning Score 2 (NEWS2)

Knowledge

TABLE II. Comparison of the median score of general knowledge between the time points of the study

Knowledge	Median (Interquartile range)	p*	df	CI 95%	
				Lower limit	Upper limit
Before training (T0)	24.00 (18.0 – 26.00)	<0.001	2	20.98	23.46
After immediately training (T1)	42.00 (39.75 – 45.00)			41.09	42.99
After training 1 month (T2)	41.00 (39.75 – 45.00)			40.95	42.77

* Friedman Test

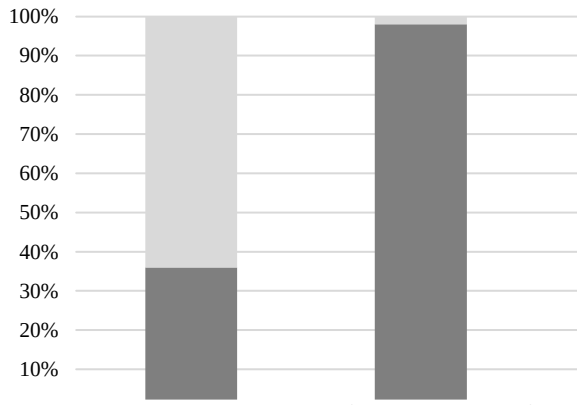

Fig. 2. General knowledge about NEWS2 of nurses at the time of study

The results of the analysis of the data before implementing the training program showed that, the total knowledge score at the time of training, the median score increased significantly immediately after being trained (T1) 42.00 (39.75 - 45.00) higher than the time before training (T0). The mean scores of knowledge gained at different time points are statistically significant. Specifically, the median score at T1 of 42.00 tended to skew right with the interquartile range (39.75 - 45.00) higher than the median score at T0 but decreased at T2.

This finding is consistent with the study of Liaw et al (2014), the results show that the mean score after the test of the experimental group is significantly higher than that of the control group in terms of knowledge after implementing EWSs (21.29 versus 18.28, p <0.001) [12]. In another study by Kyriacos et al (2015), which introduced a MEWS graph and trained using it, the study showed that the knowledge score of nurses increased from an average of 4/23 (19.5%) in the pre-intervention test to 14/23 (61.4%) (p = 0.001) at 2 weeks after the training [13]. The results of our study showed that there was a change in the skills of the nurses on NEWS2 after training compared to the time before training. Similar findings are also found in the studies of the authors: Mohamed Naeem Badr [6], Kyriacos [13], Damayanti [3].

We conclude that a training program can improve nurses' knowledge of NEWS2 in identifying patients at risk of severe progression, leading to improved knowledge and skills and reduced time to deliver clinical response is appropriate for patients within the scope of nursing expertise. This is the foundation of the change in patient identification and classification training.

Skills

TABLE III. Comparison of median skill scores at the time of study

Skills	Median (Interquartile range)	p*	df	CI 95%	
				Lower limit	Upper limit
Before training (T0)	9.0 (7.0 – 12.0)	**<0,001**	2	8.48	9.87
After immediately training (T1)	17.0 (14.75 – 18.0)			15.70	16.78
After training 1 month (T2)	17.0 (15.0 – 18.0)			16.37	17.27

* Friedman Test

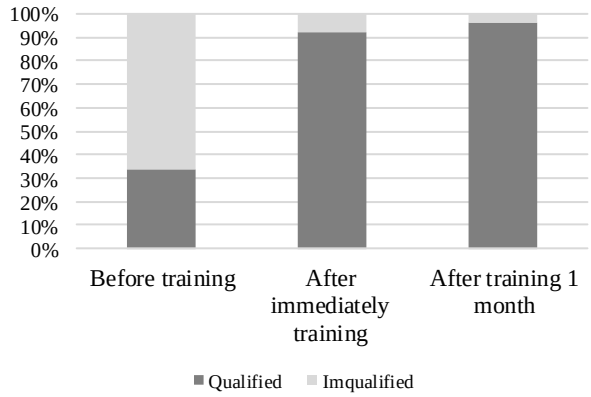

Fig. 3. Skills of using NEWS2 of nurses at the time of the study

The results of the analysis of the data before the training show that the total skill score at the time after the training period, the median score increased significantly at the time of T1 17.00 (14.75 - 18.00) and the time of T2 17.00 (15.00 - 18.00) higher than the time T0 9.00 (7.00 - 12.00). Similar findings are also found in the author's study: Liaw, Wong, Ang, et al. (2016) [14]; Merriel et al. (2015) [5]. The median skill score of the nurses achieved before training was 9.00 with the interquartile range tending to the left (7.00 - 12.00), this score is not too low compared to the maximum score (20 points), which can explain why this NEWS2 is quite easy to understand, and usable even though untrained.

The results of the analysis of each skill section using NEWS2 also show that there are many clear changes in the median score in each section. The largest difference in the

calculation of NEWS2 scores after training is 4.00 with the right quartile (4.00 - 5.00) compared with 2.00 (1.00 - 3.00) before training, this difference. Statistically significant with p<0.001. This is also found in the study of Mohamed Naeem Badr et al (2021) when the mean score increased the highest in the performance category of NEWS2 from 1.194 ± 0.92 (mean ± CI) to 3.74 ± 0.51 (mean ± CI), (p<0.001) [6].

There is a difference between the change in the general knowledge score and the general skill score about NEWS2. Skill points increase gradually over time T0, T1, T2. The knowledge score increased gradually from the time T0 to T1 but decreased at T2. This can be explained by the fact that the skills are mainly applied in daily clinical practice, there is reinforcement and repetition, so the ability to use NEWS2 is maintained and improved. The knowledge part is more theoretical without reinforcement and repetition, so there is a small decrease after a period of little use. Psychologist Hermann Ebbinghaus came up with the theory of the forgetting curve. Accordingly, when learning, all new information exposed will be saved in short-term memory. If not repeated or used often, this information will be quickly forgotten. From there, it is possible to consider amending the content of the training program to be more appropriate.

TABLE IV. Nurses' attitudes about National Early Warning Score - NEWS2 at the time of the study

Attitude	Mean ± SD	p*	df	F	MS
Before training (T0)	2.14 ± 0.64	<0.001	2	336.889	48.298
After immediately training (T1)	3.77 ± 0.20				
After training 1 month (T2)	3.91 ± 0.14				

In this study, it was found that after training, nurses' attitude on NEWS2 was more positive (3.91 ± 0.14) than before training (2.14 ± 0.64). From here, it shows that the training program has a positive impact on the nurses' attitude towards this NEWS2 scale.

Knowledge and skills are the necessary basis for the formation of capacity in each field of activity. It is impossible to be competent in math without knowledge and practice, practice in different types of problems. However, if you only have knowledge and skills in a certain field, it is not necessarily considered competent, but it also requires effective use of sources of knowledge, skills, attitudes, and values. self-responsibility to successfully carry out tasks and solve problems that arise in practice as conditions and contexts change. This course with us has positively impacted the knowledge, skills and attitudes of nurses. In addition, the assessments were performed based on clinical situations that were developed, which helped nurses improve their knowledge and skills in solving the problem of disease classification based on the NEWS2 tool. This has formed the habit of self-assessing the patient care process as well as applying the NEWS2 scale as a basis for patient identification. Although the intervention method was only for a short period of 4 weeks, it initially had a positive impact on the attitude and application of NEWS2 of Emergency Department nurses. Similar to the research results of Shaddel et al (2014) showing that the attitudes and confidence of nurses increased significantly in a positive direction [9].

V. Conclusion

A training program based on Albert Bandura's social learning theory through observation-based learning is appropriate to guide the use of National Early Warning Score 2 (NEWS2) for all medical staff to improve capacity building for nurses to directly take care of patients. In particular, create a common standard among healthcare facilities in identifying, classifying, and responding to patients at risk of severe progression based on NEWS2. The training program is effective in improving the knowledge, and skill of nurses. Attitude and intention to useuniver NEWS2 of clinical nurses reached a high rate.

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References

[1.] Bandura, Albert (1977), *Social Learning Theory*, Englewood Cliffs: Prentice-Hall.
[2.] Brenda Lynn Wiles (2016), *Using The National Early Warning Score As A Set Of Deliberate Cues To Detect Patient Deterioration And Enhance Clinical Judgment In Simulation*, Case Western Reserve University, School of Nursing.
[3.] Damayanti, Roshy, Trisyani, Yanny, and Nuraeni, Aan (2019), "Effects of Early Warning Score (EWS) Tutorial Simulation on Nurses' Knowledge and Clinical Performance", *2019*. 9(2), p. 11.
[4.] Liswasti (2015), "Gambaran Tingkat Pengetahuan Perawat Tentang Early Warning Score di RSKB Cinta Kasih Tzu Chi Cengkareng. (skripsi) Jakarta: Univesitas Indonesia, access from http://lib.ui.ac.id/login.jsp?requester=file?file=digital/2016-3/20413985-S61113-Liswatiliswati.pdf".
[5.] Merriel, Abi, van der Nelson, Helen, Merriel, Sam, Bennett, Joanne, Donald, Fiona, Draycott, Timothy, and Siassakos, Dimitrios %J American Journal of Medical Quality (2016), "Identifying deteriorating patients through multidisciplinary team training". 31(6), pp. 589-595.
[6.] Mohamed Naeem, Badr, Nahla Shaaban, Khalil, and Ahmed Mohamed, Mukhtar (2021), "Effect of the National Early Warning Score Education Program on Nurses' Knowledge at an Emergency Hospital", *Medico Legal Update*. 21(4), pp. 260-268.
[7.] Petersen, John Asger, Rasmussen, Lars S., and Rydahl-Hansen, Susan (2017), "Barriers and facilitating factors related to use of early warning score among acute care nurses: a qualitative study", *BMC emergency medicine*. 17(1), pp. 36-36.
[8.] Royal College of Physicians (2017), *National Early Warning Score (NEWS) 2: Standardising the assessment of acute-illness severity in the NHS*, Updated report of a working party. London: RCP, 2017.
[9.] Shaddel, Farshad, Khosla, Vivek, Banerjee, Subimal %J Progress in Neurology, and Psychiatry (2014), "Effects of introducing MEWS on nursing staff in mental health inpatient settings". 18(2), pp. 24-27.
[10.] Shanmugavalli Janakaraj (2020), *Effectiveness of Education on Modified Early Warning System for Nurses*, Walden University.
[11.] Richard, A., Frank, O., and Schwappach, D. (2018), "Chief physicians' attitudes towards early warning score systems in Switzerland: Results of a cross-sectional survey", *J Eval Clin Pract*. 24(2), pp. 331-337.
[12.] Liaw, S. Y., Chan, S. W., Chen, F. G., Hooi, S. C., and Siau, C. (2014), "Comparison of virtual patient simulation with mannequin-based simulation for improving clinical performances in assessing and managing clinical deterioration: randomized controlled trial", *J Med Internet Res*. 16(9), p. e214.

[13.] Kyriacos, U., Jelsma, J., James, M., and Jordan, S. (2015), "Early warning scoring systems versus standard observations charts for wards in South Africa: a cluster randomized controlled trial", *Trials*. 16, p. 103.
[14.] Liaw, S. Y., Wong, L. F., Ang, S. B., Ho, J. T., Siau, C., and Ang, E. N. (2016), "Strengthening the afferent limb of rapid response systems: an educational intervention using web-based learning for early recognition and responding to deteriorating patients", *BMJ Qual Saf*. 25(6), pp. 448-56.