

## Original Research

# Sensitivity And Specificity Numerical Range Scale-Competency (Nrs-C) In Emergency Care

Heru Suwardianto<sup>1\*</sup>, Santi Angraini<sup>2</sup>

<sup>1</sup>Department of Emergency and Critical Nursing STIKES RS Baptis Kediri, Jawa Timur, Indonesia

<sup>2</sup>Intensive Care Unit, Baptist Hospital in Kediri, Jawa Timur, Indonesia

### ABSTRACT

**Background:** Emergency conditions always occur every day around us, and the delay in aid makes the condition getting worse after arriving at the emergency department. Emergency competency assessments that continue to develop ensure increased competence for students to further increase student awareness of emergency conditions. The research objective is the development of the Emergency Sensitivity and Specificity Range Scale Competency (NRS-C) for Emergency Services

**Methods:** Observational analytical research method using secondary data competency assessment of 101 respondents who have done daily emergency training. Inclusion criteria, namely high school students' class XI and XII. The sampling technique used is random sampling by taking randomly (single blink). Data were analyzed using the Receiver Operating Curve (ROC Curve).

**Results:** The results showed that most respondents were 16 years old (41%), and have a female gender (54%). The results showed that the sensitivity value was 84% and the specificity was 16%, with an AUC Area value of 0.794, and  $p=0,001$ , which means it has a fairly good AUC value.

**Conclusion:** The NRS-C instrument can be used in the emergency department competency assessment which is quite good in assessing the competence of an emergency department..

### ARTICLE HISTORY

Received : January 1<sup>th</sup>, 2021

Accepted : July 8<sup>th</sup>, 2021

### KEYWORDS

competence; emergency care; instrument nrs-c

### CONTACT

Heru Suwardianto



[herusuwardianto@gmail.com](mailto:herusuwardianto@gmail.com)

Depatemen keperawatan gawat darurat dan kritis STIKES RS. Baptis Kediri, Jl Mayjend Panjaitan, No. 3B Kota Kediri, Jawa Timur, Indonesia

**Cite this as:** Suwardianto, H., & Angraini, S. (2021). Sensitivity And Specificity Numerical Range Scale-Competency (NRS-C) In Emergency Care. (*JKG*) *Jurnal Keperawatan Global*, 32-38. <https://doi.org/10.37341/jkg.v0i0.175>

## INTRODUCTION

The training at the school level will improve emergency cycle preparedness in their environment. There are various benefits of cyclic emergency training such as encouraging a healthy lifestyle, developing social and leadership skills and improving academic performance (Post et al., 2019). Most of the time they are in buildings, and they have a sizable community at the school. Health workers must be active in carrying out education as well as high school level training with various training in emergency management in daily life. The training must also be measured accurately and also seen

from various assessment indicators so that the expected competency results can be achieved after the training is carried out.

Emergency training in schools is still lacking and not so common (Schildkraut & Nickerson, 2020). Emergency training in schools can be carried out for several days and the results of many studies also report that perceptions of student preparedness have increased significantly. The results of previous studies showed that there was an increase in the application of procedures by 27% from previous training related to emergency management in schools (Schildkraut & Nickerson, 2020). The results also showed that emergency training in schools related to cardiopulmonary resuscitation (CPR) and automated external defibrillator (AED) resulted in a positive response rate of 11.7% of respondents (Busick, 2016; Scarneo-Miller, Kerr, Adams, Belval, & Casa, 2020; Trump, 2018). The evaluation results also showed that after the training they implemented it more often (95.5%) than those who did not.

Identification of all emergency factors in the environment is very important because it may be that every school has different needs for emergency procedures. Schools support the implementation in providing facilities and also the need for training implementation is very important in its implementation. Preparedness for the occurrence of emergency conditions must be increased as part of victim prevention in case of emergency conditions or preventing worsening conditions at school. One of the assessment indicators, namely indicators of emergency preparedness and awareness, selected through literature, is classified into four components, namely circulation and emergency evacuation, support and assistance, communication, and search and rescue (Khan, Rana, Nawaz, & Waheed, 2020). The development of emergency training competency assessment tools continues to be developed professionally by emergency nurses in increasing competency and measurement accuracy.

Education can be done face-to-face or online in continuous learning and improve the quality of education that continues to develop. NRS-C is an emergency competency assessment in assessing several assessment indicators that are continuously being developed to see their effectiveness

## **MATERIALS AND METHOD**

This study was observational analytic with a cross-sectional design, measuring the competence of the emergency department with Numeric Range Scale Competency (NRS-C). The research objective was to determine the sensitivity and specificity of the Numeric Range Scale Competency (NRS-C). As a competency measuring instrument. The target sample is secondary data from the results of taking daily emergency training competencies for high school students in Kediri City from 2019 to 2020 with a total of 101 high school students. The research was conducted in September 2020.

The inclusion criteria were high school students in class XI and XII. The sampling technique used is random sampling by taking randomly (single blink). The researcher randomized the data whose competency scores were taken by the enumerators. The instrument used as a standard in the study was the Numeric Range Scale Competency (NRS-C) which was used to assess competence after daily emergency training for high school students. NRS-C is an assessment range between a score of 0 to 10 with a meaning of 0 very bad and 10 very good, the assessment is divided into sub-variables, namely knowledge, understanding of the purpose of action, procedures, and vigilance.

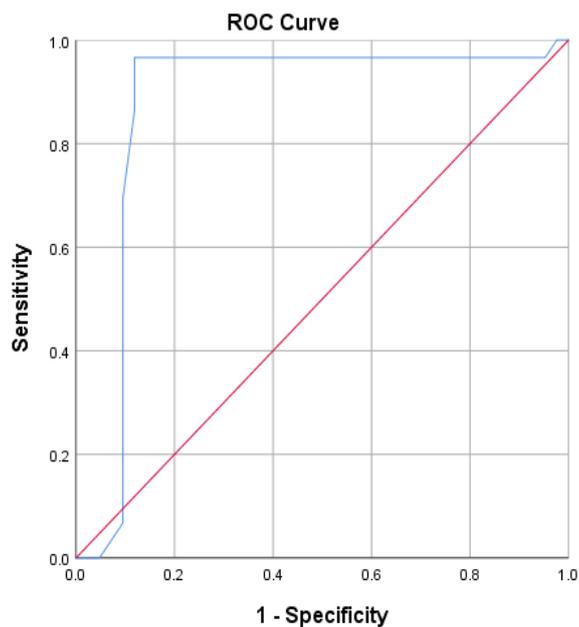
The process of collecting assessment data with direct guidance to the assessor goes together and ends with a joint assessment by the assessor. Researchers involved 5 remunerators, namely nursing students. Statistical tests used Relative Operating Characteristics (ROC) and Area Under Curve (AUC). Sensitivity pays attention to conditions of good scores, while sensitivity is more concerned with low scores that tend to be negative. The point of interest in this study is to see the ability of the index to detect positives and negatives in subjects, with the psychological limit of AUC is 0.5. The number of Ethical Clearance 017/09/IX/EC/KEPK/Lemb.Candle/2020 from KEPK Lembaga Chakra Brhamanda Lentera with Kodefikasi Kelembagaan Komisi Etik Penelitian dan Pengembangan Kesehatan Nasional Kementerian Kesehatan Republik Indonesia are 3506023S.

## RESULTS

**Tabel 1.** Distribution Frequency of Demographic data Respondents

Demographic data	Frequency	Percent
Age		
14 Years old	2	2,0
15 Years old	33	32,7
16 Years old	42	41,6
17 Years old	15	14,9
18 Years old	9	8,9
Gender		
Male	46	45,5
Famale	55	54,5

Based on the tabel 1, it was found that most respondents were 16 years old, amounting to 41%. Most respondents have female gender, namely 54%, while the female gender is 46%.



**Figure 1.** ROC, Sensitivity and Specificity Curve

Based on the results (Figure 1) of the ROC curve, the sensitivity of the AUC is around 84% with a false positive rate of 16%, which means that the NRS-C instrument has the right ability to assess competency. AUC is considered good if > 50% and AUC results. NRS-C can predict the ability of trainees after daily emergency training. The results also show that the AUC area is 0.794, where the closer to number 1, the better the value. The results also showed an AUC value of  $p = 0.001$ .

## DISCUSSION

Sensitivity and specificity values are needed to assess competency assessment instruments. The NRS-C sensitivity value of more than eighty percent indicates that the AUC has a good value. The assessment of these instruments is expected to be used in emergency competency assessments. NRS-C has cognitive and psychomotor assessment abilities that have reliability and validity between instrument gauges. This assessment instrument can be used in measuring the competencies that have been done.

NRS-C focuses on cognitive about everyday emergency conditions, explanation of the purpose of action, action procedures, to the alertness of helpers in carrying out assessments. Under the conceptual theory, namely the breeding of specific training and good assessment will be able to measure the quality of good competencies and have a positive perception of students (Aini, 2019; Januarista, 2019; Suwardianto, 2015, 2018; Watung, 2021). Management in an emergency department needs to be continuously developed and applied in various agencies, and assessment management and measurement standards must continue to be developed, as well as training because more than thirty percent of students forget the knowledge that has been taught and about twenty-nine percent forget what has been done in emergency action (Cheng et al., 2019; Kerr, 2019).

This assessment has shown good things in measuring emergency competence. The advantage of using NRS is that it is easy to do and also ranges from 0 to 10 by using the assessed sub-variables. NRS-C has a good ability to assess the good abilities of participants. Daily emergency competency training is very important for high school students to learn to equip them to anticipate and help in the event of an emergency (Agustini, Suyasa, Wulansari, Dewi, & Rismawan, 2018; Prastiwi, 2019; Romadoni & Ardianty, 2018). The training explains the understanding of knowledge of emergency conditions during daily conditions, furthermore, it also provides an understanding of the purpose of each action having certain benefits and rationale in its implementation. The training also provides competencies related to the procedure for actions taken so that what is done is under the procedure that should be done or is under the standards that should be.

Training is important to equip students in the prevention of accidents inside the school and outside of school, as well as planning for alertness and capacity building for students to improve to get good perceptions and increase in students (Murata, Scarneo - Miller, McMahon, & Casa, 2020; Olympia, Weber, Brady, & Ho, 2017; Pelto & Drezner, 2020). This is also supported in research that students need to be provided with support in emergency training with various methods that are under environmental, socio-cultural conditions so that competence can be accepted and they can carry out these procedures properly or according to the standard procedure of action (Archer & Hughes, 2011; Suwardianto & Rimawati, 2018). Senior high school students need to understand day-to-day emergency action with the hope of becoming a cadre in their environment because more than eighty percent of emergency events occur outside

health facilities such as hospitals or clinics. Emergency events mostly occur in families and communities, and most times when they are brought to the emergency department it is too late or the condition is so severe that it cannot be saved.

Competency assessment after daily emergency competency training needs to be assessed correctly. One of the means is to use the NRS-C to assess the competence that has been given is sufficient for them to carry out daily emergency management actions. High school students play an active role in the implementation and also become the main cadres in the youth and family environment in making decisions. Daily emergency actions or first aid can be done before the health team comes to help or the victim is taken to a health facility such as an emergency room or hospital. NRS-C is expected to be able to guarantee that the score given is relevant and one of the measuring tools that can be expected to measure student competence in carrying out daily emergency actions.

This research needs to continue to be developed because it has limitations, namely the subject is still not homogeneous with the existence of several subjects who have different class and age levels and the need for standard values in comparing other tools that may need to be done.

## **CONCLUSION**

The NRS-C instrument can be used as an instrument in a simple efficient emergency competency assessment without adding other variables which are sometimes quite a lot and minimizing assessment errors and misperceptions.

## **ACKNOWLEDGEMENT**

Thank for SMA N 3 Kediri, SMAK Agustinus Kediri, SMA Petra Kediri, and all of anumerators who help our reaserch.

## **REFERENCES**

- Agustini, N. L. P. I. B., Suyasa, I. G. P. D., Wulansari, N. T., Dewi, I. G. A. P. A., & Rismawan, M. (2018). Penyuluhan dan Pelatihan Bantuan Hidup Dasar. *Paradharma (Jurnal Aplikasi IPTEK)*, 1(2).
- Aini, D. N. (2019). PKM PELATIHAN PERTOLONGAN PERTAMA DALAM GAWAT DARURAT PADA ORANG AWAM. *Jurnal Implementasi Pengabdian Masyarakat Kesehatan*, 1(2).
- Archer, A. L., & Hughes, C. A. (2011). *Explicit Instruction; Effective and Efficient Teaching*. New York, United States Of America: The Guilford Press.
- Busick, J. (2016). Preparedness is Prevention: Emergency Preparedness Could Have Prevented These Injuries. *EHS*, 1.
- Cheng, X. U. E., Shumei, W., Cheng, X. U. E., Shumei, W., Zhoufeng, Y. E., Fenfen, L. I., & Jun, R. E. N. (2019). Research on the needs of vocational high school students for injury prevention and emergency skills education. *Journal of Injury and Violence Research*, 11(4).
- Januarista, A. (2019). Pengaruh pelatihan bantuan hidup dasar terhadap keterampilan

- anggota palang merah remaja sekolah menengah atas al azhar palu. *Jurnal Ners Widya Nusantara Palu (Ners Journal of Widya Nusantara Palu)*, 3(1).
- Kerr, S. E. M. (2019). Emergency Management and Communication Improvements: Changing the Landscape of School Safety. In *Handbook of Research on School Violence in American K-12 Education* (pp. 474–493). IGI Global.
- Khan, A. A., Rana, I. A., Nawaz, A., & Waheed, A. (2020). Gender-based emergency preparedness and awareness: empirical evidences from high-school students of Gilgit, Pakistan. *Environmental Hazards*, 1–16.
- Murata, Y., Scarneo-Miller, S. E., McMahon, L. J., & Casa, D. J. (2020). Adoption of Emergency Action Plans in Secondary Schools: A Study of School Nurses' Knowledge and Behavior. *Journal of School Health*, 90(9), 694–702.
- Olympia, R. P., Weber, C., Brady, J., & Ho, S. (2017). Emergency and disaster preparedness of school transportation staff and school buses in the United States: compliance with recommendations for school transportation safety. *Pediatric Emergency Care*, 33(11), 718–723.
- Pelto, H. F., & Drezner, J. A. (2020). Design and implementation of an emergency action plan for sudden cardiac arrest in sport. *Journal of Cardiovascular Translational Research*, 1–8.
- Post, E. G., Schaefer, D. A., Biese, K. M., Cadmus-Bertram, L. A., Watson, A. M., McGuine, T. A., ... Bell, D. R. (2019). A comparison of emergency preparedness between high school coaches and club sport coaches. *Journal of Athletic Training*, 54(10), 1074–1082.
- Prastiwi, I. (2019). *Pengaruh Peer Education Basic Life Support terhadap Motivasi Menolong Korban Henti Jantung pada Anggota PMR di SMA Muhammadiyah 2 Yogyakarta*. Universitas' Aisyiyah Yogyakarta.
- Romadoni, S., & Ardianty, S. (2018). PELATIHAN BANTUAN HIDUP DASAR BAGI SISWA PMR. *Khidmah*, 1(1), 80–85.
- Scarneo-Miller, S. E., Kerr, Z. Y., Adams, W. M., Belval, L. N., & Casa, D. J. (2020). Influence of State-Level Emergency Planning Policy Requirements on Secondary School Adoption. *Journal of Athletic Training*, 55(10), 1062–1069.
- Schildkraut, J., & Nickerson, A. B. (2020). Ready to respond: effects of lockdown drills and training on school emergency preparedness. *Victims & Offenders*, 15(5), 619–638.
- Suardianto, H. (2015). *Buku ajar keperawatan kegawatdaruratan (perspektif, konsep, prinsip, dan penatalaksanaan kegawatdaruratan)* (1st ed.). Surabaya: PT. REVKA PETRA MEDIA.

- Suwardianto, H. (2018). Level Of Perception Emergency Skills In Youth Red Cross. *JOURNAL OF NURSING PRACTICE*, 2(1), 17–24.
- Suwardianto, H., & Rimawati. (2018). Explicit Instruction Model (EIM): Daily Training Emergencies Preparedness (DTEP) Toward Skills of Participants the Youth Red Cross. *Conferences, The 2nd Joint International*, 2(2), 403–410.
- Trump, K. (2018). School Security & School Emergency / Crisis Preparedness Training School Security and Emergency Planning Training Formats and Topics.
- Watung, G. I. V. (2021). Edukasi Pengetahuan dan Pelatihan Bantuan Hidup Dasar Pada Siswa Remaja SMA Negeri 3 Kotamobagu. *Community Engagement and Emergence Journal (CEEJ)*, 2(1), 21–27.