



# Design and psychometric properties of the acute care quality in trauma emergency units scale

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Received: 18 May 2023 / Accepted: 27 August 2023

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## Abstract

**Background** Systematic trauma care scale could be designed and used by nurses to completely and adequately fulfill a complex care to improve trauma care quality. The purpose of this study was to design and evaluate the psychometric property of the Nursing Care Quality in Trauma Emergency Units and trauma care promotion.

**Methods** This methodological study was conducted in 2022. The process of designing and psychometric assessment of the scale was performed in two steps such as Generating an Item Pool and Validity and Reliability evaluation (Item reduction). The construct validity was determined using the experimental intervention; for determining the reliability of the scale and internal consistency, we measured the inter-rater reliability (IRR). Data were analyzed using the SPSS software, version 22.

**Results** Based on our findings, the CVI and CVR of the scale were 1 and 0.83–1, respectively. A significant difference between the pre- and post-intervention scores in group 1 supports the inference that the construct has been appropriately represented, and the instrument has construct validity ( $p < 0.001$ ). We found that there was a significant difference in the scores of Patient assessment, Planning and Implementations, and Evaluation of the care plan. The inter-rater reliability method allows the optimal reliability assessment of observational instruments, which was used in this study, and the results confirmed excellent reliability of the instrument.

**Conclusions** The validity and reliability of the Nursing Care Quality in Trauma Emergency Units Scale were confirmed. The instrument could successfully assess the process of nursing care in the trauma emergency ward. The use of this checklist is recommended as a valid observational tool for other researchers.

**Study type** Therapeutic/care management.

**Keywords** Acute care · Trauma · Emergency · Methodological studies · Psychometric

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and saving many lives [27–29], designing a new tool compatible with specific nursing processes might be more acceptable.

Lack of enough information about the quality and validity of the research tools can create challenges for publishing the results of the study, and in the case of publication, it is possible that the reader does not achieve necessary awareness and assurance of the quality of the validity of the tools and the method of its evaluation.

The importance of measuring the quality of trauma nursing care and the need for a valid tool for measuring this content prompted us to do a study about standardization of the quality of Nursing Care in Trauma Emergency Units Scale. Based on our findings, the CVI and CVR of the Nursing Care in Trauma Emergency Units Scale were 1 and 0.83–1, respectively. Polit and Beck suggested that a CVI value of 0.9 or more is an acceptable content validity of an instrument [30].

In the present study, we designed and applied a scale of quality of trauma nursing care in a real context and found appropriate content validity. We also confirmed the content validity (CVR and CVI) of the scale using quantitative methods during trauma nursing care for severely injured patients in the emergency trauma unit. The face and content validity confirmed the simplicity and clarity of the items and the ease of use of the tool.

The construct validity showed a significant difference between the pre- and post-intervention scores in group 1, and it supports the assumption that the construct has been appropriately represented and the instrument has construct validity. We found that there was a significant difference in the scores of Patient assessment, Planning and Implementations, and Evaluation of the care plan. In addition, the significant difference between the scores of the total instrument before and after the intervention confirmed the construct validity.

In this study, there was no significant difference between the pre- and post-intervention scores of the nursing diagnosis subscale. There is a need for more intervention and longer follow-up to obtain meaningful results. The inter-rater reliability method allows the optimal reliability assessment of the observational instruments, which was used in this study, and the results confirmed the excellent reliability of the instrument.

Based on the survey, it seems that there has been no tool designed for measuring the Quality of Nursing Care in Trauma Emergency Units Scale. For the first time in the country, designing this tool has been done, based on psychometric processes and by using the target group's views and remarkable and various specialists. Paying attention to maintaining simplicity and eloquence and observing brevity and logical sequence of the items are the strong points of this tool. However, inaccessibility to similar studies in national

level can be counted as the limitations of the study. Therefore, as a limitation, the possibility of Hawthorne effect during the observations cannot be overruled. Another limitation was the participation of medical personnel from a single city. It is recommended that psychometric assessment of the instrument should be performed in more than public and private hospitals as well as other hospital units in Iran. This clinical-based study can encourage policymakers of trauma emergency units to assess the quality of care for severely injured patients in complex emergency circumstances and create specific protocols to improve the process of care.

Despite the substantial length and time requirement, the instrument was considered helpful for emergency trauma care. Thus, further research on the psychometric qualities, implementation aspects, and effectiveness of the ACTES is needed.

## Conclusion

The validity and reliability of the quality of trauma nursing care checklist were confirmed. The instrument could successfully assess the process of nursing care in the trauma emergency ward. The instrument can also be used to assess trauma emergency nursing care between other hospital units that have similar conditions to the settings of the present study. The use of this checklist is recommended as a valid observational tool for other researchers.

**Acknowledgements** This study was extracted from the dissertation of the first author with the financial support of University of Social Welfare and Rehabilitation Sciences. We thank all the managers and staffs of the Shahid Rajaee Hospital for their assistance. We also thank the nurses that directly and indirectly helped in performing this study. The authors would like to thank Shiraz University of Medical Sciences, Shiraz, Iran and also Center for Development of Clinical Research of Nemazee Hospital and Dr. Nasrin Shokrpour for editorial assistance.

**Author contributions** Study concept, design and supervision: ZJ, ME, KNT and HK; acquisition of data: ZJ; analysis and interpretation of data: ZJ, KNT and HK, MZN, HS, ME; drafting of the manuscript; ZJ, MZN, ME and HS; critical revision of the manuscript for important intellectual content, statistical analysis, and administrative, technical, and material support: KNT and HK.

**Funding** No funding source.

**Data availability** The authors confirm that the data supporting the findings of this study are available within the article and its supplementary materials.

## Declarations

**Conflict of interest** The authors declare no conflict of interests.

**Ethical approval** The Ethics Committee of Tehran University of Social Welfare and Rehabilitation Sciences approved the protocol of the study (IR.USWR.REC.2019.169). Written informed consent was obtained