

Development and initial psychometric evaluation of the hospitalization-related stressors questionnaire for elderly patients

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ABSTRACT

Background: Various factors threaten the health and recovery of hospitalized elderly, including stressors in medical service centers. Therefore, the aim of the present study was to develop and preliminary validate a measurement tool to assess hospitalization-related stressors (HRS) among the elderly.

Materials and Methods: This methodological research was conducted in 2015. The study was performed in two main phases. In the first phase, which was to develop the questionnaire, the data were collected through literature review, interview with few elderly patients, and calculating content validity index with the participation of 16 experts. The second phase included preliminary validation of the questionnaire in which a convenient sample of 200 hospitalized elderly patients recruited from 4 educational medical centers of the Isfahan University of Medical Sciences were studied. Principal component analysis method was used to identify the factorial structure of the questionnaire. In order to evaluate validity, Cronbach's alpha coefficient was calculated.

Results: After evaluating the results and relocating and merging some of the items, a version of 26 items in 7 categories was prepared with acceptable internal consistency (Cronbach's alpha coefficient from 0.67 to 0.78 for the components and 0.83 for the tool).

Conclusions: In this study, we were able to identify a set of important components and indicators of HRS in elderly; so it can be used as a useful instrument. Future studies are recommended in order to develop and validate this tool in other communities.

Key words: Elderly, hospitals, questionnaire design, stress

INTRODUCTION

Because of the global demographic and epidemiologic changes, human beings are increasingly faced with the issue of aging.^[1] According to the United Nations estimates, the elderly population in the world will increase

from approximately 10.5% in 2007 to approximately 21.8% in 2050. Iran is also quickly progressing toward aging,^[2] and currently, approximately 7.3% of the population consist of people aged over 60.^[3]

Aging is a time when people experience vast changes in the physical, mental, social, and other aspects of life. The statistics of disease outbreaks and hospitalizations in this period show that elderly population are the largest consumers of health and social services and this demand increases every day.^[4] In Iran, 31% of referrals resulting in hospitalization are related to the age group over 60 and include 37% of the costs.^[3]

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Although hospitalization provides the elderly with some opportunities for recovery and for preventing disability, some evidence suggest that there are many factors that threaten the health and recovery of hospitalized elderly; including stressors in the health care providing centers.^[5] Elderly are more vulnerable to stress compared to young people because of diminished physiologic stores and chronic diseases.^[6] In response to this challenge, stress management in the elderly and particularly in hospitalized individuals is considered to be one of the main priorities of the health system.^[7]

Until now, various researchers have focused on the stressors associated with hospitalization and different tools have been developed and used in order to assess these in different age groups or in a certain group of patients. For instance, in a study by Nasiri *et al.*,^[8] stressors including physical, mental, and environmental stress associated with hospitalization in the cardiac care unit were investigated using 41 items. Latha and Ravi Shankar^[9] introduced stressors associated with hospitalization in a psychiatric unit using 49 items termed as hospital stress rating scale (HSRS). Koenig *et al.*^[10] grouped stressors associated with hospitalization in elderly into seven categories including adverse effects of diagnostic or therapeutic procedures, changes related to lifestyle, relationships with staff, individual psychiatric issues, understanding diagnosis and prognosis, family issues, and the physical environment. Nevertheless, no comprehensive tool for examining stressors associated with hospitalization in the elderly has been developed, particularly in Iran. Sue and Sue^[11] pointed out that there is a cultural difference in the perception of stressors. Moreover, according to Rosa *et al.*,^[12] it is necessary that the identified factors are compatible with the background and cultural context of each community. Therefore, the present study aimed to develop and primarily evaluate the hospitalization related stressors questionnaire for elderly patients (HRSQ-EP) from a psychometric point of view.

MATERIALS AND METHODS

The present cross-sectional and methodological study aimed to develop and primarily evaluate the HRSQ-EP from a psychometric viewpoint, and it was conducted in two phases with seven steps. In the first phase of the study, the questionnaire was developed, and in the second phase, it was evaluated in terms of initial psychometric properties. The study was conducted in the Isfahan University of medical sciences (IUMS), Iran in 2015.

Phase I: Development of the questionnaire

The HRSQ-EP was developed to measure the extent to which a set of distinct hospitalization related events have

been perceived as stressors by elderly patients. Three steps were followed in this phase as follows.

Step 1: Generating a pool of items. The items for HRSQ-EP were generated by (a) reviewing the relevant literature and (b) conducting semi-structured interviews. In order to find the existing relevant tools and constructs, more than 30 relevant articles, from the year 2000 to 2015 in CINAHL, Google scholar, Medline, PubMed, and SID were reviewed. In order to clarify and obtain more insight into some of the retrieved stressors, seven semi-structured interviews with elderly patients and their professional care givers were conducted. Finally, the initial item pool ($n = 119$) was identified. After a three-round revision and overview of the initial item pool, 36-item questionnaires was constructed. Items were rated on a 5-point Likert scale (from “1” = strongly disagree to “5” = strongly agree).

Step 2: Determining face and content validity. Ten expert panel members (six with master degrees and experienced in geriatric nursing and four with doctoral degrees and experienced in psychometrics) evaluated the face and content validity of the first version of the instrument. Content validity index (CVI)^[13] was considered to identify acceptable items. A 4-point Likert scale (1 and 2 indicating unacceptable and 3 and 4 indicating acceptable items) was used to assess the experts' views in terms of relevance, simplicity, and clarity of statements for each item. Moreover, a CVI value of ≥ 0.80 indicated good content validity.^[14] Few of the items were found to be unclear and were rephrased and the second 36-item version of the HRSQ-EP was established.

Step 3: Pilot testing. A pilot study including 30 hospitalized elderly patients was conducted in order to perform further necessary modifications and establish internal consistency of the second version of the HRSQ-EP. Seven out of 36 items were excluded to get the third version of the HRSQ-EP. Cronbach's alpha coefficient was 0.65.

Phase 2: Initial psychometric evaluation of the HRSQ-EP

A nonprobability stratified sample of 200 elderly patients hospitalized in four educational hospitals affiliated with Isfahan University of Medical Sciences was recruited for the study. Two steps (steps 4 and 5) were followed in order to perform initial psychometric evaluation as follows.

Step 4: Conducting principal component analysis (PCA) and further scale refinement. PCA with Varimax rotation was used to identify the scale dimensions. Normality of the distribution of the data was ensured through calculating the skewness and kurtosis statistics; all of which were between ± 1.5 .^[15] The Bartlett's test for sphericity was significant

($P < 0.001$) and the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was 0.697, indicating that it was appropriate to use the PCA. The criterion of eigenvalue ≥ 1 was used for defining the number of factors. Model acceptance was based on factor loading more than 0.4 for the respective component.^[16]

Step 5: Evaluation of reliability. The Cronbach's alpha coefficient was used to ensure the internal consistency of the subscales and total scale for the last version of the HRSQ-EP. A Cronbach's alpha ≥ 0.70 was considered adequate.^[14] The Statistical Package for the Social Sciences (SPSS for Windows, Version 16.0. Chicago, SPSS Inc.) version 12 was used for statistical data analysis.

Ethical considerations

The study was approved by the IUMS research Committee (394099). Participants signed an informed consent and were given written information. Moreover, voluntary participation, privacy, and confidentiality were ensured.

RESULTS

The mean (standard deviation; SD) of the participants' age and their hospital stay was 67.29 years and 7.44 (1.2) days, respectively. Sixty percent of the participants were male and 90.5% lived with their own family members.

In summary, the initial item pool ($n = 119$) from the first step was used to construct the second 36-item and 29-item version of the HRSQ-EP in the second and the third steps, respectively. The average CVI was 0.91 for the total scale and ranged from 0.8 to 1 for the items, indicating an acceptable level of content validity.^[17] Based on the findings from the fourth step, 10 factors with eigenvalues > 1 were extracted,^[16] explaining 64% of the total variance. All items demonstrated moderate to strong loading on one of the ten factors (> 0.4) [see Table 1]. There were four pairs of items that loaded on the four separate components, leading each component to be consisted of only two items. Kenny has suggested at least three items for each factor.^[18] Therefore, these eight items were merged or conveyed to the other components based on their conceptual relevance [see Table 1].

Cronbach's alpha coefficient was used to define internal consistency and showed that the refined 26-item HRSQ-EP had a coefficient of 0.83, indicating good internal consistency; the values for all the domains ranged from 0.67 to 0.78 [Table 1].

DISCUSSION

The present study aimed to develop a measurement tool for assessing HRS in elderly. Based on the results, HRS

in the elderly consisted of seven components including "physical stressors, lack of knowledge related stressors, stressors related to staff, environmental stressors, stressors related to the changes in personal and social lifestyle, psychological stressors, and disease related stressors." Koenig *et al.*^[10] grouped stressors related to hospitalization into seven categories, which were similar to the present study in four categories including "stressors related to lifestyle changes, relationships with staff stressors, stressors related to individual mental issues, and physical environment stressors." Nasiri *et al.*^[8] examined hospitalization related stressors in three physical, environmental and mental categories; all of which are conceptually the same as the categories identified in the present study. Moreover, Fakhari and Maskani^[19] introduced HRS in four physical, mental, social and spiritual categories; the first two categories were the same as that of the present study.

Regarding the first category of "physical stressors," our findings showed that some of its subordinate items were similar to what Nasiri *et al.*^[8] found in their work. In their study, two items including "limited motility due to connection to the monitor" and "pain due to some action like injections" were conceptually similar to items "limited motility due to the connected equipment" and "diagnostic and therapeutic procedures such as blood test or venipuncture" in the present study.

The second category was "stressors related to lack of knowledge" that consisted of 3 items. Rabie Siahkhalil *et al.*^[20] identified the same category in their study; however, different items were loaded on this category.

The third category, "stressors related to staff," consisted of six items as "use of unfamiliar words by the doctor or the nurse," "doctor or the nurse not having enough time to respond to my needs," and "staff not respecting my privacy," which were conceptually similar to some items subordinate to the category of "staff related stressors" in the work of Pang and Suen.^[21]

The fourth category identified in this study is "environmental stressors." In the study of Nasiri *et al.*,^[8] 12 items were included in this category, which despite apparent differences in writing and the number of items, all constituent items except for "existence of the machines in the environment" were similar to the items included in the same category in the present study.

The fifth category was "stressors related to changes in personal and social lifestyle" including four items with relatively strong factor loadings (0.53–0.83). Logan *et al.*^[22] designed a 23-item scale to determine the type and severity

Table 1: The final components structure and Cronbach's α coefficients of the 26-item HRSQ-EP

Components	Items	Factor loading	Commonality	Cronbach's α coefficient
Physical stressors	1. Fatigue and impatience due to the long length of treatment	0.41	0.57	0.78
	2. Requiring help for personal matters such as using catheter or else in bed	2.22	1.29	
	3. Mobility limitation due to the connected equipment	0.84	0.76	
	4. Diagnostic or therapeutic measures such as blood sampling or venipuncture or intravenous catheterizing	0.64	0.60	
Stressors related to low knowledge	5. Unfamiliarity with hospital's rules	0.76	0.67	0.67
	6. Unfamiliarity with hospital's environment	0.76	0.69	
	7. Being unaware of their own rights in the hospital	0.73	0.65	
Stressors related to care and treatment staff	8. Not being confident in the care and treatment	0.78	0.66	0.71
	9. Use of unfamiliar words by doctor or the nurse	0.50	0.62	
	10. Doctor or the nurse not having enough time to respond to my needs	0.74	0.69	
	11. Communication of staff with me	0.59	0.65	
	12. Staff not respecting my privacy	0.65	0.57	
	13. Staff not responding in a timely manner to my needs	0.56	0.58	
Environmental stressors	14. Hospital rules about issues such as bed time, time to eat, visiting hours, and time to take medication	0.73	0.63	0.70
	15. Hospital facilities such as room, bed, lighting, food, temperature and conditioning	0.77	0.67	
	16. Noise and traffic	0.80	0.71	
Stressors related to changes in personal and social lifestyle	17. Disruption of routine and normal habits and behaviors such as sleep and resting, activity, and diet	0.52	0.53	0.72
	18. Limited contact with family and relatives	0.83	0.73	
	19. Difficulty doing religious obligations	0.65	0.72	
	20. Family disturbances	0.53	0.64	
Psychological stressors	21. Worry about changes in body appearance due to illness and treatment	0.52	0.54	0.68
	22. Fear of death due to the risks of disease and treatment	0.74	0.62	
	23. Worry about long lasting or persistent disability	0.55	0.60	
Disease related stressors	24. Having another physical illness or disability besides current disease	0.72	0.69	0.68
	25. Being in pain due to the illness	0.51	0.57	
	26. Low awareness about disease and treatment	0.42	0.61	
Total				0.83

of HRS among dialysis patients, among which "limitation in doing activities," "insomnia," "change in family relations," and "reduction in social relations" were conceptually similar to most items loaded on this category in the present study.

The sixth category identified in the present study was "psychological stressors" that has been determined as a part of HRS in some relevant studies. For instance, Koenig *et al.*^[10] introduced "psychiatric stressors" as a main category that consisted of four items including "unexpected disease in hospital," "fear of attachment to others," "feeling of loneliness," and "loss of control in life," the last of which is conceptually similar to "fear of long or permanent disability"

that has been loaded on the category of "psychological stressors" in the present study.

The last category of HRS is "disease related stressors." This component is also existed in some similar tools; however, most of its constituent items differ that may be related to work on the different study populations. For instance, in the study of Parvan *et al.*,^[23] two items of "having heart disease" and "being in pain" were conceptually overlapping with "having physical illness or disability other than heart disease" and "being in pain due to illness" items of "disease related stressors" category in the present study.

Overall, the scale developed in this study, identified various aspects of HRS. Nevertheless, these aspects do not cover all possible dimensions of these stressors. Therefore, further studies are necessary to capture a comprehensive set of HRS in the elderly patients' population.

CONCLUSION

The present study was performed to develop a tool to assess hospitalization stressors in elderly. The indicators of stressors related to hospitalization in elderly were identified in this study so that it can be used as a useful instrument. In spite of some similarities between identified categories in the present study with some of the available scales, an important set of HRS in the elderly has been determined using this assessment tool; which is in line with the cultural, social, and organizational structure of country and can be utilized to identify and evaluate stressors associated with hospitalization in elderly. Future studies with the purpose of developing and validating this tool in other communities are recommended.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Zilochi MH, Pourreza A, Akbari F, Rahimi Froushani A. Pattern of the elderly in-patient use of services. *Kashan Hospital Periodical* 2011;10:63-70.
- Mirzaei M, Shams Ghahfarkhi M. Demographic characteristics of the elderly population in Iran according to the census 1976–2006. *Iranian J Ageing* 2007;2:326-31.
- Soltani MH, Sahhaf R, Mohammadi F, Ghaffari Sh, Khosravi A, Gohari MR. Elderly, duration of hospitalization and hospital cost in Milad Hospital in Iran. *Iranian J Ageing* 2012;6:58-65.
- Shojaei A, Akbari Kamrani AA, Fadaye Vatan R, Azimian M, Ghafari Sh, Jamali MR. The health costs and diseases in Medical Services Insurance Organization, Tehran province, 1386 (2008). *Iran J Age* 2012;6:65-74.
- Chandra A, Gruber J, McKnight R. Patient cost-sharing and hospitalization offsets in the elderly. *Am Econ Rev* 2010;100:193-213.
- Mattison M, Schmader KE, Auerbach AD, Park L. Hospital management of older adults. Retrieved from: <https://www.google.com>. [Last accessed on 2015 May 12].
- Zakerimoghadam M, Aliasgharpoor M, Mehran A, Mohammadi S. Effect of patient education about pain control on patients' anxiety prior to abdominal surgery. *J Hayat* 2010;15:13-22.
- Nasiri M, Rahimiyan B, Jahanshahi M, Hajiyan K, Nikfar J. Stressors associated with hospitalization in the stressful cardiac care unit. *Iran J Crit Care Nurs* 2011;4:141-8.
- Latha KS, Ravi Shankar BG. Hospital related stress among patients admitted to a psychiatric in-patient unit in India. *Online J Health Allied Sci* 2011;10:1-6.
- Koenig HG, George LK, Stangl D, Tweed DL. Hospital stressors experienced by elderly medical inpatients: Developing a hospital stress index. *Duke University Medical Center Durham, North Carolina*; 1995.
- Sue D, Sue DM. *Foundations of Counseling and Psychotherapy: Evidence-Based Practices for a Diverse Society*. New Jersey; 2007. p. 291.
- Rosa BÂ, Rodrigues RCM, Gallani MCBJ, Spana TM, Pereira CGS. Stressors at the intensive care unit: The Brazilian version of the environmental stressor questionnaire. *Rev Esc Enferm USP* 2010;44:623-30.
- Polit DF, Beck CT. The content validity index: Are you sure you know what's being reported? Critique and recommendations. *Res Nurs Health* 2006;29:489-97.
- Denise FP, Beck CT. *Essentials of Nursing Research: Appraising Evidence for Nursing Practice*. 8th ed. China: Lippincott Williams and Wilkins; 2013.
- Bachman LF. *Statistical Analyses for Language Assessment Book*. Cambridge University Press. Cambridge; 2004.
- Rasli A. *Data Analysis and Interpretation – A Handbook for Postgraduate Social Scientists*. Penerbit UTM. Kuala Lumpur, Malaysia 2016. p. 15.
- Waltz C, Strickland OL, Lenz E. *Measurement in Nursing and Health Research*. 4th ed., Springer Publishing Company; New York; 2010. p. 165.
- Kenny DA. Identification: Overview. 2014. Retrieved from: <http://davidakenny.net/cm/mfactor.htm>. [Last accessed on 2015 May 10].
- Jafarzadeh Fakhari M, Maskani k. A comparison of the perceptions nurses and cardiac patients from both disease and hospital stressors. *J Sabzevar Univ Med Sci* 2006;13:122-6.
- Rabie Siahkali S, Avazeh A, Eskandari F, Khaleghdoost Mohammadi T, Mazloom S, Paryad E. A survey on psychological and environmental factors on family anxiety of the hospitalized patients in intensive care units. *Iran J Crit Care Nurs* 2011;3:177-80.
- Pang PSK, Suen LK. Stressors in the ICU: A comparison of patients' and nurses' perceptions. *J Clin Nurs* 2008;17:2681-9.
- Logan SM, Pelletier-Hibbert M, Hodgins M. Stressors and coping of in-hospital haemodialysis patients aged 65 years and over. *J Adv Nurs* 2006;56:382-91.
- Parvan K, Zamanzadeh V, Lak Dizaji S, Mousavi Shabestari M, Safaie N. Patient's perception of stressors associated with coronaryartery bypass surgery. *J Cardiovasc Thorac Res* 2013;5:113-7.