Brief Report

The Validity and Reliability of the Constructs of Pain Management-Measuring Tool for Incurable Patients

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Abstract

Background: Pain is one of the most critical symptoms of the disease in incurable and terminally -ill patients. Forty- five to 85 percent of the patients hospitalized in the intensive care units usually experience various levels of pain.

Objectives: The present study aimed to test the validity and reliability of the constructs of pain management-measuring tool for incurable patients using a factor analysis method.

Methods: In this descriptive methodological study, the literature was reviewed to design and develop a pain management-measuring questionnaire, consisting of 20 questions, for incurable patients. The face and content validity of the questionnaire and its constructs were measured using a panel of experts and factor analysis method, respectively, and its reliability was measured using internal consistency (Cronbach's Alpha) method. 100 incurable patients hospitalized in a university- affiliated hospital, in Ilam City, Iran, who were selected using a proportionate stratified sampling method, participated in this study.

Results: The results of the factor analysis suggested that the 20 questions of the questionnaire comprised of six main factors, and each factor was renamed. The first factor, which affected four questions, with a variance rate of 14.77% was named "pain concept." The second factor, which affected five questions, with a variance rate of 12.21% was named "pain control." The third factor, which affected three questions, with a variance rate of 11.71% was named "actions for the incurable patient." The fourth factor, which affected four questions, with a variance rate of 9.66% was named "medical measures for the incurable patient." The fifth factor, which affected four questions, with a variance rate of 8.94% was named "post-demise actions for the incurable patient." The sixth factor, which affected two questions, with a variance rate of 6.54% was named "comforting incurable patient."

Conclusions: The present study showed that the pain management-measuring questionnaire for incurable patients could be used as a valid and reliable tool for collecting the required data in the measurement and management of incurable patients' pain.

Keywords: Factor Analysis, Incurable Patients, Pain, Reliability, Validity

1. Background

Pain is one of the most important common symptoms of the disease in the incurable and terminally ill patients. 45 to 85 percent of the patients hospitalized in the intensive care units usually experience various levels of pain (1-7). Few studies have been conducted to determine the efficiency of pain management programs in controlling the pain of the incurable patients. In Iran and intensive care units, most pain-management decisions are made based on changes in the patient's vital signs and personal judgments. The painkillers are usually prescribed based on the physician order, and not the patients' real needs. No re-evaluation is done after using the painkillers, and there are

no certain procedures in this regard in the treatment units. Furthermore, the above said measures are not recorded, and usually, due to the concerns about side effects and patient's addiction, the dosage of the prescribed medicine is less than the physician-ordered dose. Incurable patients are those who are disappointed in medical treatments provided by the physicians and medical staff and are aware of the fact that they will pass away shortly. An important task of the medical staff is to provide the mental and spiritual comfort for such patients (8-16). In the present study, for the first time in the country, we attempted to design a tool for measuring the concept of pain control, pain management for incurable patients, and the necessary actions in this regard.

2. Methods

The present study is a descriptive methodological study. The research population consisted of all incurable patients hospitalized in the intensive care unit of Shahid Mostafa Khomeini Hospital of Ilam in 2016. The sample size was estimated at 118 persons according to Morgan and since 15.5% of the population did not answer the questions, finally 100 persons participated in the study. KMO indicator was estimated at 0.796, which is indicative of the adequate number of participants. This indicator is excellent when it is greater than 0.8 and good when greater than 0.7. It is necessary to mention that the sample size was determined based on the number of incurable patients hospitalized in the intensive care unit of Shahid Mostafa Khomeini Hospital of Ilam. The pain management-measuring questionnaire for the incurable patients was designed using the library studies and based on the comprehensive review of the existing literature (1-3), and a self-made questionnaire was prepared (4). The questionnaire consisted of two parts. The first part includes demographic information of the incurable patients (age, gender, marital status, type of disease, and treatment unit), and the second part included 20 questions scored on a five-point Likert scale (I fully agree = 5 points; I fully disagree = 1 point). The questionnaire had totally 100 points in four domains (the first domain consisted of five questions about pain control, the second domain consisted of five questions about pain management, the third domain was about actions taken for the incurable patients, and the last domain consisted of five questions about the pre-demise and post-demise measures). The sample population consisted of 100 incurable patients hospitalized in Shahid Mostafa Khomeini Hospital of Ilam in 2016. The sample was selected using the proportionate stratified sampling method. The face and content validity of the questionnaire and its constructs were measured using a panel of experts and factor analysis method, respectively, and its reliability was measured using internal consistency (Cronbach's Alpha) method. In order to test the reliability of the questionnaire, the final questionnaire was distributed to ten incurable patients, and redistributed to the same patients after two weeks. The reliability of the questionnaire was measured using "test-retest" method and the coefficient of correlation between the two tests was 0.83. Considering the similarity of the answers, the reliability of the questionnaire was confirmed. 10 persons did not participate in this study. The most important question was about the validity of the content that was to see whether the questionnaire measures the concept of pain management for incurable patients or not. The Chi-square test, Confirmatory Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA) were used to measure the fit factor of the questionnaire.

3. Results

The results showed that the Cronbach's Alpha coefficient for this tool is 80%. The results of the fit statistics of exploratory factor analysis showed that the value of Chi-square statistic in the factor analysis construct was 1805 (P < 0.05). The fit statistics of this tool were calculated as RMSEA = 0.55 and CFI = 0.91, which are both desirable values. The factor analysis results also suggested that the 20 questions of the questionnaire consist of six main factors, and each factor was renamed. The first factor, which affected four questions, with a variance rate of 14.77% was named "pain concept". The second factor, which affected five questions, with a variance rate of 12.21% was named "pain control". The third factor, which affected three questions, with a variance rate of 11.71% was named "actions for the incurable patient". The fourth factor, which affected four questions, with a variance rate of 9.66% was named "medical measures for the incurable patient". The fifth factor, which affected four questions, with a variance rate of 8.94% was named "post-demise actions for the incurable patient". The sixth factor, which affected two questions, with a variance rate of 6.54% was named "comforting incurable patient" (Table 1). Bartlett test was also significant for this questionnaire (P < 0.001). The value of KMO was 0.796, which is suitable for the factor analysis. Figure 1 shows the Scree Plot diagram, and the results show that the questionnaire consists of six main factors.

4. Discussion

The present study showed that the pain management questionnaire could be used as a valid and reliable tool for collecting the information required for the treatment of incurable patients. The confirmatory fit index (CFI) usually ranges between zero and one, and the values greater than 0.90 are indicative of the goodness of fit. CFI is preferred to the other indices such as Goodness of Fit Index (GFI) and Incremental Fit Index (IFI) (1). RMSEA index also ranges between zero to one; but unlike CFI, this index is more desirable when closer to zero; and values smaller than 0.1 are indicative of the goodness of fit. The Cronbach's alpha values

Table 1. Factor Analysis of Pain Management-Measuring Tool for Incurable Patients

Number	Question	Name of Factors	Total Especial	Percent Variance	Cumulative Percent
1	12, 11, 9, 6	Pain concept	2.87	14.77	14.77
2	14, 16, 18, 15, 10	Pain control	2.48	12.21	26.98
3	11, 5, 17	Non-pharmacological treatments for incurable patients	2.1	11.71	38.69
4	4, 7, 19, 20	Pharmacological treatments for incurable patients	2.07	9.6	48.29
5	2, 3	Post-demise actions for incurable patients	1.99	6.54	54.83
6	8, 19	Comforting incurable patients	1.68	6.54	65.85
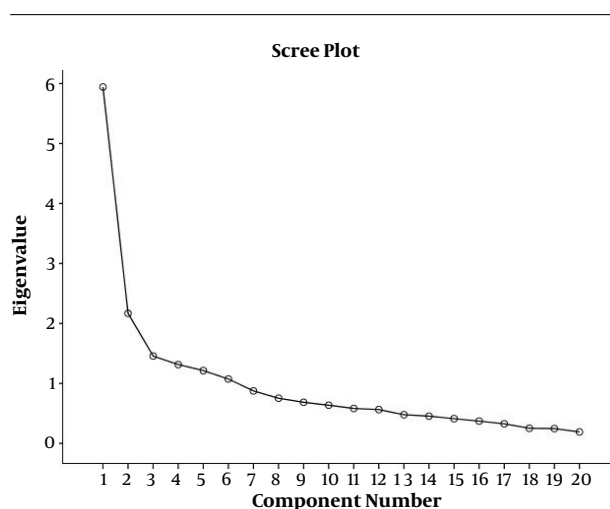
Figure 1. Scree Plot Diagram shows the number of desired factors in the pain management questionnaire for incurable patients. The 20 questions of the questionnaire consist of six factors. A total of 20 derived factors were equal to 20 statistic tools.

of greater than 0.7 are indicative of internal consistency (17-20). In the present study, the value of Cronbach's alpha was greater than 0.75, which shows that the questionnaire provides a satisfactory internal consistency for incurable patients. The values of the remaining errors or the measurement errors were relatively small. Indeed, this type of error includes inherent errors, which occur in all research tools and are not related to the concealed constructs. Generally, these small remaining values somehow express that although the nature of the questions was somehow subjective, the measuring tool was valid and reliable, and the repeated use of this tool would provide similar results. A high coefficient of correlation between the questions related to each factor is indicative of their consistency. Considering the fact that this is the first time to use this tool, there have been limitations amongst which we may name unconformity of the validity and reliability results of the questionnaire.

The pain control and management-measuring questionnaires for incurable patients can be used as a valid and reliable tool for the patients. This questionnaire can be a practical guide for pain measurement and management in the treatment of such patients.

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Footnote

Conflict of Interests: The authors declare no conflict of interests.

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