# Construction of satisfaction assessment scale for patients with critical.

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## Abstract

**Objective:** To construct a comprehensive and effective evaluation tool for the management of sober patients with critical illness.

**Method:** The Delphy conducted two rounds of expert consultation of 33 experts, and used AHP to determine the weight of each index. According to the established rating scale, a sample of 135 patients was investigated to verify the reliability and validity of the evaluation table.

**Results:** Determination of 4 first grade indexes, two level 30 indexes, evaluation of critically ill conscious patient satisfaction scale; Cronbach's coefficient of total scale were 0.931, the split half reliability was 0.887, the construct validity of KMO (MSA) value was 0.863, the difference was statistically significant. Principal component analysis was used to obtain the target factor loadings of 0.4.

**Conclusions:** The evaluation of critically ill patients with sober satisfaction scale evaluation system has good reliability and scientific, and can provide the basis for improving the better methods of critically ill awake patient satisfaction, so as to improve the quality of intensive care.

## Introduction

With the deepening of quality nursing, satisfaction gradually becomes an important index of evaluating the quality of medical care [1]. The satisfaction degree of patients is the gold standard of modern hospital management, the index of evaluating nursing quality and improving medical nursing work, and the satisfaction degree is directly objective and impartial evaluation of hospital service and technical level, and it is also a key index of grading Hospital evaluation [2]. However, Severe medical department because of the special nature of the ward, the patients are often in critical condition, coma, no family escort, and so on, which leads to the difficulty in evaluating the satisfaction of critically ill patients. According to looking up the historical documents, which relates to the study of the satisfaction degree of family members of critically ill patients involved reliability and validity, but did not find the study of the scale of satisfaction assessment for critically ill patients, resulting in the difficulty of obtaining satisfaction in critically and seriously ill care environments [3]. Therefore, this study intends to construct a questionnaire of satisfaction degree of patients with critical illness, and provide a basis for comprehensive, objective and scientific evaluation of critical patients ' satisfaction.

## Research Team Building Up

This research team composes of multi-disciplinary members, including 1 nursing management experts, 1 psychologists, 5 clinical experts in ICU, and 1 experts in statistics. The main task is to determine the subject of the study, select the consulting expert, prepare consulting documents, and analyze the research results.

### Consulting experts

The key to the selection of Delphi Expert's letter of inquiry is the choice of the inquiry expert [4], which follows the principle of voluntariness, authority and representativeness in the selection of experts.

### Inclusion criteria

1. Volunteered to participate in the study, and confirmed that it could be completed in conjunction with this study;

2. In a three-level general hospital or higher medical school in nursing management, clinical nursing or nursing education work for 5 years or more;

3. Bachelor degree or above,

4. Intermediate level or above. In order to ensure the selection of experts representative, each unit of experts ≤ 2 people. Finally, we identified 33 experts from ICU nursing management, ICU Clinical nursing, hospital quality Management, nursing education and psychology in 5 fields.

### Initial scale construction

*Via* consulting the literature of domestic and foreign nursing satisfaction evaluation indexes, combined with the evaluation

of domestic nursing satisfaction and nursing characteristics of critically ill patients, 5 ICU clinical experts, according to the principles of indicators, to the naming of indicators, classification organization discussion analysis, the initial establishment of critical care Patient Satisfaction Index system framework, Including the first level indicator 4, namely the inpatient environment, communication, professional skills, professional attitude, level two indicator 28 items.

## Expert inquiry questionnaire preparation

The questionnaire includes four parts:

1. **Preface (to expert Letter):** Introduce the background, purpose and the necessity of the inquiry.

2. The method of this questionnaire and the evaluation scale of satisfaction degree.

**Critically ill patients:** including the first level, level two index and scoring method of the scale, this study adopts Likert5 grade scoring method to be classified as very important, important, general, not very important, unimportant, 5 grades, rated 5 to 1 in order.

4. **Expert general information:** including the name and nature of the unit, the department, name, age, title, education, working life and working methods.

5. **Expert self-assessment table:** Evaluation experts on the degree of familiarity with the contents of the questionnaire and the basis of the questionnaire when filling.

## Survey method

Inputs the questionnaire contents into the questionnaire network, generate questionnaire survey two-dimensional code, the questionnaire two-dimensional code through the we chat, e-mail sent to each letter of inquiry experts, experts through the mobile phone we chat scanning two-dimensional code, directly into the system to fill out questionnaires, completed through the system submitted. At the end of the first round of inquiries, the research team made changes to some of the indicators by analyzing the results of the letter and the expert opinion. The revised questionnaire was again entered into the questionnaire network, the second round of questionnaire survey two-dimensional code, two-dimensional code issued to experts to conduct a second round of expert inquiry. The final form of critical patient satisfaction assessment scale after obtaining the approval of the Medical ethics Committee of the hospital and the patient's consent, a small sample survey was conducted, and a total of 135 patients with critical illness were voluntarily enrolled, and theresults were tested with reliability and validity.

## The statistical method

Uses SPSS16.0 to analyze the expert situation and the inquiry result. The reliability of the consultation structure is tested by the index of expert positive coefficient, expert authority coefficient and expert coordination coefficient. Using AHP method to determine the index weight, using Cronbach' sα consistency coefficient evaluation reliability, using Spearman correlation Update method to test scale construction validity,

and using factor analysis method to test the distinguishing validity of evaluation index.

## Result

### The basic information

The 33 experts are from 9 cities nationwide, 4 medical colleges and Universities, 18 3-Grade A comprehensive hospital. The basic situation of experts is shown in table 1.

**Table 1.** *Information on experts*

| Item | Categories | Number of people | Percent (%) |
|---|---|---|---|
| **Professional field** | ICU Care | 13 | 39.3 |
| | ICU Clinical Nursing | 15 | 45.5 |
| | Hospital Quality Management | 2 | 45.5 |
| | Nursing Education | 2 | 6.1 |
| | Psychology | 1 | 3 |
| **Age (age)** | 25-29 | 2 | 6.1 |
| | 30-39 | 17 | 51.5 |
| | 40-49 | 13 | 39.4 |
| | ≥ 49 | 1 | 3 |
| **Professional title** | medium class | 11 | 33.3 |
| | Deputy Senior | 15 | 45.5 |
| | High | 7 | 21.2 |
| **Work experience (year)** | 5-10 | 6 | 18.2 |
| | 30-10 | 24 | 72.7 |
| | >30 | 3 | 9.1 |

**The positive coefficient of experts:** The positive coefficient (Cai) [5] refers to the recovery rate of an expert inquiry questionnaire, which indicates the degree of attention of experts to this study. The recovery rate of the two rounds of expert inquiry questionnaires was 94.3%, 100%, and the effective rates were 100%. Note that experts attach great importance to participating in this study. See table 2.

**Degree of expert authority:** The expert to judge the content of the consulting topics based on the coefficient (CA) CA sum equal to 0.6, suggesting that the impact of expert judgment is small; CA sum equals 0.8, prompting the influence degree of expert judgment is medium; CA sum equals 1.0, prompting the influence degree of expert judgement is great. The average ca=0.87 of this research expert. The grading criteria for expert judgment are shown in table 3, and the self-assessment is shown in table 4.

**Table 3.** *Grading criteria for expert judgment*

| Criteria | The degree of influence of judgment |
|---|---|

| | Big | Middle | Small |
|---|---|---|---|
| **Theoretical Analysis** | 0.5 | 0.4 | 0.2 |
| **Practice Basis** | 0.3 | 0.2 | 0.2 |
| **Domestic and foreign literatures** | 0.1 | 0.1 | 0.1 |
| **Intuitive Sense** | 0.1 | 0.1 | 0.1 |

**Table 4**. *Self-assessment based on expert judgemen*

| Criteria | Self-evaluation of expert judgment based on Judgement N (%) | | |
|---|---|---|---|
| | Big | Middle | Small |
| **Theoretical Analysis** | 29 (87.9) | 4 (12.1) | 0 (0) |
| **Practice Basis** | 24 (72.7) | 8 (24.2) | 1 (3.1) |
| **Domestic and foreign Literatures** | 16 (48.5) | 12 (36.4) | 5 (15.1) |
| **Intuitive Sense** | 6 (18.2) | 9 (27.3) | 18 (54.5) |

Experts on the content of the degree of familiarity (CS) CS divided into 5 grades: unfamiliar, not very familiar, general, more familiar, very familiar, the specific quantitative value and expert results refers to table 5, here this study cs=0.85.

**Table 5.** *The expert's familiarity degree score (Cs) and the expert self-assessment situation*

| Criterion | Determine the degree of familiarity with the inquiry by the expert | | | | |
|---|---|---|---|---|---|
| | Unfamiliar | Lightly unfamiliar | Common familiar | More familiar | Very familiar |
| **CS Score** | 0.1 | 0.3 | 0.5 | 0.7 | 0.9 |
| **Self-evaluation N (%)** | 0 (0) | 0 (0) | 2 (6.1) | 15 (45.5) | 16 (48.5) |

**Expert authority degree:** The expert Authority (CR) [6] is up to two factors, it is the coefficient (Ca) and the degree of familiarity of the inquiry content (Cs), cr=(Ca+cs)/2, and the average cr=0.86 of all the experts in this study, respectively.

**The coordination degree and concentration degree of expert opinion:** The harmony coefficient of kendall′s W is 0.361, 0.396, and the two-level index W value is 0.175, 0.267, p<0.001 respectively. The arithmetic mean, the full score ratio and the coefficient of variation are described in the importance score of index items [7]. The first round of the results showed that the average score of all the indexes was 3.7-5.0, the total score was 31%-100%, the variation coefficient 8.7%-33.1%, the second round of letters was 3.93-5, the total score was 39.3%-100%, the variation factor 4.3%-29.8%.

**The results of the inquiry:** Use "boundary value method" to select the core problem of the evaluation index of satisfaction degree of patients with critical illness. With the importance of index value, the >3.50 score, the full score ratio% and the coefficient of variation <20% as the standard [8,9], a total of 24 experts in the first round of the inquiry on some of the indicators proposed to add, delete, modify views. According to the expert opinion and the guideline design principle, this research team made a change to the initial evaluation scale:

1. The first-level indicators of "communication and communication" modified to "information Access",

2. New two-level indicator 2, respectively, "Medical and nursing team efficiency", "examination results, surgery and treatment of clarity".

3. Revise level two indicator 4, respectively, "ICU medical staff answer your question" to "ICU medical staff clearly answer your question", "Develop your recovery plan" to be able to explore your rehabilitation program together "," Nurse to understand your needs "modified to" nurse to see your needs in a timely manner "," The ICU healthcare staff is "modified to support and encourage your ICU healthcare staff".

After two rounds of expert inquiry, the evaluation system of the satisfaction degree of the critically ill sober patients was determined, including 4 items of level One, two level 30, and the weight of each index was calculated by analytic hierarchy process based on the second round of experts ' inquiry results. The weights of each index are shown in table 6.

**Table 6.** *Evaluation index and weight of satisfaction rating scale for patients with critical illness.*

| First-level index (weight) | Second-level index | Weight |
|---|---|---|
| **A. In-patient environment (0.263)** | A1 ICU environmental Comfort situation | 0.31 |
| | A2 Noise control status of ICU Ward | 0.303 |
| | A3 ICU Ward lighting control status | 0.301 |
| | A4 is ready for you to turn out of ICU | 0.236 |
| **B. Information Access (0.229)** | B1 medical staff can communicate with you on a regular basis | 0.307 |
| | B2 medical staff can truthfully introduce you to the illness | 0.301 |
| | B3 ICU Medical staff clearly answer your question | 0.287 |
| | B4 interpretation of the results of the examination, surgery and treatment clarity | 0.199 |
| | B5 knowledge of the efficacy of the drug used | 0.099 |

| | | |
|---|---|---|
| | B6 Daily Nurse Daily and you exchange care situation | 0.296 |
| | B7 can effectively inform before treatment nursing | 0.076 |
| | B8 can discuss your recovery plan | 0.196 |
| **C. Professional skills (0.249)** | C1 to your doctor's degree of trust | 0.093 |
| | C2 the level of trust you have in charge of nurses | 0.098 |
| | C3 nurse can appreciate your needs in time | 0.101 |
| | C4 can effectively solve your pain problem | 0.299 |
| | C4 can effectively solve your breathing problem | 0.189 |
| | C5 can protect your privacy | 0.304 |
| | C6 can effectively relieve your depression | 0.311 |
| | C7 can effectively handle your anxiety problem | 0.288 |
| | C8 Medical care Team efficiency | 0.102 |
| **D. Professional Attitude (0.259)** | D1 ICU Healthcare staff support and encouragement to you | 0.289 |
| | D2 can arrange visiting time for your relative elasticity | 0.316 |
| | D3 can often be encouraged by medical staff | 0.281 |
| | D4 can respect and protect your privacy | 0.168 |
| | D5 the timeliness of your response to your needs | 0.225 |
| | D6 out of office check waiting time | 0.138 |
| | D7 respect your customs and beliefs | 0.186 |
| | D8 meet the overall situation you need | 0.236 |
| | D9 doctor 's overall service satisfaction | 0.297 |
| | D10Total service satisfaction of D10 nurses | 0.197 |

### *Reliability of scale and validity of inspection*

**Reliability verification:** The total Cronbach' sα coefficient is 0.931, the half reliability is 0.887, the Cronbach' sα coefficient is 0.919 and the half reliability is 0.861.

**Validity verification:** Have spearman correlation analysis of all two-level indexes and one-level index. The results show that the correlation coefficient of the first level index corresponds to P01. The results of factor analysis showed that the KMO value was 0.863, exceeding the recommended value of 0.6000, and the difference was statistically significant, indicating that the data were suitable for cooperative factor analysis. By using the main component analysis, the maximal orthogonal rotation of variance, the extraction of each factor, and the >0.4 of the target factor load are obtained, so the 30 entries in the original scale are well explained.

## Discussion

### *The scientific and reliability of the construction of scale*

The research is based on Delphi method for expert inquiry, analytic hierarchy process and credit validity test. The evaluation scale of satisfaction degree of patients with critical illness was formed. By analyzing the qualifications and titles of the selected experts, we find that they have higher academic authority in this field, and have higher prediction precision for the construction of index system, which shows that the results of this research are convincing. The authoritative coefficient is a measure of the representativeness and authority of experts, and it is generally believed that the authoritative coefficient of experts is cr ≥ 0.70 as acceptable range [10], this study shows that the selected experts have higher accuracy and higher authority for the prediction of index. The harmony coefficient of the two-wheeled communication expert index kendall′s W is 0.361, 0.396, the two-level index W value is 0.175, 0.267, p<0.001 respectively, which indicates that the expert's prediction is based on solid theory and practice, and the result of the inquiry has a high degree of credibility and authority. In this study, the correlation coefficients of all first level indexes correspond to P01, and the internal consistency coefficient of each level index is greater than that of the first level index and other level, and the construction validity of the evaluation scale is higher. In this study, the weight coefficients of each index are obtained, and the analysis shows that the index system has reasonable weight distribution, which guarantees the scientificity and objectivity of the obtained weights.

## Content and weight analysis of scale index

The results show that the first-level index weights in turn are inpatient environment, professional attitude, professional skills and information acquisition indicate that the hospitalization environment, professional attitude and professional skills are very important to the evaluation of the satisfaction of patients with critical illness.

**Inpatient environment:** The environment of this research ward finally identified 4 two-level indicators, the higher the weight of the order is "ICU environment Comfort" (0.310), "ICU Ward Noise Control Status" (0.303), "ICU Ward lighting Control Status" (0.301). ICU is the important place of intensive care, treatment and nursing for critically ill patients [11], the staff density is high, the operation equipment is many, the rescue operation is many in the whole ICU. ICU Ward to focus on the main ward, and often deal with the need for multidisciplinary cooperation, rescue of critically ill patients, resulting in a long-term ICU in the lighting, noise stimulation, affect rest. Therefore, in the management of the ICU, all health care personnel should attach great importance to noise and light stimulation to the harm caused to critically ill patients, strengthen the control of noise and lighting, under conditions, as far as possible to put the clear patient in a single room, to provide patients with safe and comfortable rest environment.

**Information acquisition:** Identifies level two indicator 8 for information acquisition, among them, the higher weight coefficient is "medical staff can communicate with you on a regular basis" (0.307), "medical staff can truthfully introduce you to the illness" (0.301), "Nurse daily and you exchange care situation" (0.296). The information acquisition of ICU patients is mainly from the medical staff, the communication object relies mainly on the ICU nurse, they are most worried about the healing and rehabilitation of the disease, while ICU nursing focus on technical operation, as well as nursing teaching and nurse training process [12], The lack of attention to more communication with sober patients leads to insufficient information access and health education for patients.

**Professional skills:** Determine the professional skills of the two-level indicator 8, where the weight factor is relatively high is "can effectively alleviate your depression problem" (0.311), "can effectively solve your pain problem" (0.299), "can effectively deal with your anxiety problems" (0.288). About 99% patients in ICU were in different levels of anxiety, depression and sleep disorders, such as adverse symptoms, adverse emotions and sleep disorders, can damage the physiological balance of patients, further aggravating the severity of the disease [13], and due to the medical personnel configuration and the limitations of the related professional ability, often to the psychological changes in the sober patients overlooked.

**Professional attitude:** Set up the 9 items on grade 2, among them, the higher weight coefficient is "the flexibility to arrange visiting time for your relatives" (0.316), "ICU health care staff to support and encourage you" (0.289), "can often be encouraged by medical staff" (0.281). According to statistics, the current cause of patient satisfaction survey scores lower more than technical reasons [14]. A higher degree of dissatisfaction with the flexibility of visiting time of relatives [10]. Therefore, in the management of the ICU, according to the actual situation of the hospital, it is necessary to relax the visiting time of the family members, limit the number of visitors and strictly disinfect the quarantine, which may be helpful to meet the needs of the critically ill patients and their families.

## Summary

This study, as an exploratory study on the evaluation system of degree of satisfaction of critical disease, in the study, the establishment of the index is derived from the quantitative analysis of clinical objective data, which conforms to the clinical needs, and the determined index not only better clarifies the importance of the satisfaction evaluation of the critically ill patients, but also clarifies the core and key of the critical Care quality evaluation. It is scientific, operable and practical, and can be used to improve the service satisfaction of critically ill patients and provide better nursing service for critically ill patients. In the future, the research needs further theoretical and empirical research to test, so that it has better clinical application value. Therefore, the next stage needs further practice and improvement, and carry on the clinical verification of large samples, and further improves and refines the evaluation index system of the comfort degree of critically ill patients.

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