

Study on the Construction of Evaluation Index of Nursing Quality of Critically Ill Newborns

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Abstract: Objective: To achieve the effective construction of NICU nursing quality evaluation index and promote the necessary improvement of the success rate of treatment of critically ill newborns. **Methods:** The "structure-process-outcome" model was used to construct the necessary logical relationship for NICU nursing quality evaluation indicators. Then the NICU nursing quality evaluation indexes were initially established and defined accordingly. After that, the consultation scoring method was used to carry out the two rounds of questionnaire consultation, which was divided, deleted, and modified in the process. The second round of quality assessment indicators for critical neonatal care were used as research results. The establishment of the corresponding judgment matrix and the determination of the weighting relationship of each evaluation index were realized. **Results:** Forty-eight experts from 12 tertiary care children's hospitals in 9 provinces and cities in China participated in the questionnaire consultation. After the work, the resulting quality assessment indicators for critical neonatal care were agreed upon by all the experts. Sixty-seven quality indicators for critical neonatal care (18 process indicators) were evaluated based on the Structure-Process-Outcome (SPO) model. The necessary definitional work was achieved for the first round of questionnaire consultations (1 evaluation indicator, 19 structural indicators, 30 outcome indicators). In the first round of questionnaire consultations, eight evaluation indicators were deleted, one evaluation indicator was split, four evaluation indicators were added, and four indicators were added. Two evaluation indicators

were combined. In the second round of questionnaire consultation, 5 evaluation indicators were removed, resulting in a more complete quality of care for critically ill newborns. **Conclusion:** Based on the "structure-process-outcome" model, the 58 indicators for evaluating the quality of tertiary NICU care were fully obtained. The unanimous approval of the consulting experts provides a solid foundation for the later stages of treatment of critically ill neonates.

Keywords: Critically ill neonates; Quality of care; Evaluation index construction

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Current critical care neonatal (NICU) medicine is a rapidly emerging discipline in the field of pediatric medicine, the quality of care in the NICU has a profound impact on the treatment of critically ill newborns and their prognosis. Neonates are a special group, and on the one hand, the NICU provides comprehensive care for neonates, and on the other hand, the NICU provides a comprehensive care for neonates. NICU care is characterized by significant neonatal characteristics. Currently, there are indicators for evaluating the quality of care for children and adults who are critically ill, and these indicators are used to evaluate the NICU. The work does not appear to be appropriate. In recent years, there have been foreign research reports on nursing quality concerning NICU, but the implementation effect has not been confirmed yet^[1]. Based on this, it is important to realize the construction of nursing

quality evaluation index for NICU. Establishing a nursing quality evaluation index system for NICU can effectively promote the necessary improvement of NICU's overall quality, and finally it has led to the achievement of significant improvement in the treatment of critically ill neonates. The entire study is now reported below.

1 Methodology

1.1 Research design

The "structure-process-result" theoretical research model was used to realize the necessary construction of NICU nursing quality evaluation index logical relationship, and then the corresponding definition of the specific index was realized, and then the consultation integral method was used to realize the selection of the evaluation index, and the hierarchical analysis method was used to realize the effective determination of the index weights^[2].

1.2 Organizational structure and responsibilities of nursing quality evaluation index system research

1.2.1 Composition and responsibilities of the core group

The members of the experimental core group were Xiaoxia Chen, MSc, supervisor of Xiaoxia Chen, and members of the research team of Xiaoxia Chen's supervisor (Pediatric Hospital of Fudan University). (NICU Nurse Manager, Director of Nursing, NICU Director). The main responsibility of this experimental core group is to achieve the necessary selection of consultants, the theory of evaluation of quality of care for critically ill newborns. The effective selection of models, the necessary evaluation of the selection indicators for the consultative integration method, the care of critically ill newborns. The definition of quality assessment indicators, the implementation of appropriate audits, the integration of hierarchical analysis and consultation scoring methods to achieve the NICU care Effective identification of quality assessment indicators.

1.2.2 Composition and responsibilities of the information aggregation team

The members of the Data Aggregation Team were two nurses from the mentor team of Xiaoxia Chen. The main responsibility of the data summary

team members was to realize the development of quality evaluation indicators for NICU care based on relevant references work, practical application of the consultative scoring system, achieving the necessary weighting of the calculation of indicators and information collation, analysis of experimental results. of data^[3].

1.3 Statistical methods

Use SPSS 19.0 and Excel 2019 software to implement the appropriate data collation, data entry, and Data analysis work. Representation of expert data by component ratios, frequencies, etc., using the YAAHP 0.7.0 software. For the effective calculation of the combination weights and the one-time coefficient (CR) of the weight of each indicator in the NICU quality of care evaluation index system work. Portfolio weights are the ranking weights of the importance of all the factors at the same level for the target level, while indicator weights are the weights of the indicators within the same level of Corresponding factors are ranked weights for the importance of some factor at the previous level^[4]. If the $CR < 0.10$, it indicates that it meets the experimental consistency requirement.

2 Results

2.1 Structure and construction of outcome indicators

2.1.1 Structure of the aggregation and core groups

Achieving the initial construction of the aggregation group and the core group should lead to the necessary definition of the 67 indicators, which will be used as the core group. The indicators should include 18 process indicators, 19 structural indicators, 30 outcome indicators, and then a second set of indicators from the first round of consultation. The necessary definition of the indicators to be added, split, merged and modified should be achieved accordingly. During the implementation of the first round of consultation, seven of the indicators that did not meet the initial screening criteria should be deleted and the core group used. Consultation scoring method to achieve the selection of indicators for the evaluation of quality of care in the NICU by deleting one indicator and splitting one of them. operation, to which the four new criteria were added^[5]. In the second round of questionnaire consultation, the four criteria that did not meet the initial screening criteria

were deleted, and the core group was added to the list using the consultation integral method. To achieve the selection of indicators for the evaluation of the quality of care in the NICU, one indicator was deleted to ensure that the second round of questionnaire consultation is completed. Only 58 indicators (18 process, 16 structural and 24 outcome indicators) are used to evaluate the quality of care in the NICU).

2.1.2 Calculation of indicator weights

Since the second round of questionnaire consultation

did not add, split, merge or modify the indicators, the core group and the consultation deleted 4 indicators, which indicated that the remaining 9 level 3 indicators could be used to evaluate the quality of NICU care, so the weight of each indicator could be calculated based on this, and the results are shown in Table 1 below.

Table 1. The second round of first-level (7), second-level (7) and third-level (9) indicators questionnaire consultation and weight calculation

Table 1. The second round of first-level (7), second-level (7) and third-level (9) indicators questionnaire consultation and weight calculation

Grade 3	standard deviation	average value	Coefficient of variation	Weight	Frequency of perfect scores	Combined weights
I	0.4	4.8	0.09	0.31	85.4	0.31
I -A	0.6	4.7	0.12	0.23	72.9	0.07
I -A-1	0.5	4.7	0.1	0.75	70.8	0.05
I -A-2	0.6	4.3	0.14	0.25	37.5	0.02
I -B	0.4	4.8	0.08	0.33	83.3	0.1
I -B-1	0.4	4.7	0.09	0.1	72.9	0.07
I -B-2	0.5	4.6	0.12	0.11	60.4	0.03
II	0.6	4.5	0.14	0.16	54.2	0.03
II -A	0.5	4.2	0.13	0.08	27.1	0
II -A-1	0.6	4.3	0.14	0.08	37.5	0
II -A-2	0.6	4.2	0.14	0.28	25	0.01
II -A-3	0.6	4.2	0.14	0.13	25	0.01
II -A-4	0.6	4.5	0.13	0.67	58.3	0.04
II -A-5	0.6	4.5	0.13	0.33	58.3	0.03
III	0.6	4.5	0.12	0.05	52.1	0.01
III -A-1	0.3	4.9	0.06	0.25	89.6	0.02
III -A-2	0.4	4.8	0.08	0.75	83.3	0
III -B	0.6	4.2	0.14	0.17	27.1	0.01
III -B-1	0.6	4.2	0.15	0.33	25	0.05
III -B-2	0.4	4.5	0.13	0.67	54.2	0.02
III -C	0.5	4.6	0.12	0.17	62.5	0.04
III -C-1	0.5	4.4	0.12	0.33	43.8	0.49
III -C-2	0.6	4.5	0.12	0.67	52.1	0.27

From the data in Table 1, it is easy to see that the seven secondary, seven primary, and nine tertiary indicators of the second round all have a high level of sophistication. However, the frequency distribution of perfect scores for Levels I, II and III ranged from 60.3% to 88.7%, 25.5% to 3.5% and 25.5% to 90.8%, 6.2%-98.1%, and the range of importance assigned to each of their indicators is 4.7-5.0, 4.0-5.0, and 3.6-5.1, thus indicating that the range of perfect scores for primary, secondary and tertiary indicators and the range of importance assigned to each of them is 4.7-5.0, 4.0-5.0, and 3.6-5.1, and 3.6-5.1, thus it appears that the frequency range of full scores for the primary, secondary, and tertiary indicators and their respective indicators'. The mean of the importance assignments showed a gradual widening trend^[6]. Moreover, the

CRs of their consistency detection data are below 0.1, which means that they are sufficiently consistent.

3 Discussion

NICU care is provided not only to newborns who are not fully developed psychologically, physically and linguistically, but also to those with Other vital individuals with critical illnesses, because of the differences in care recipients, there are significant differences in actual NICU care practices and operational skills. At present, there are index systems for evaluating the quality of critical care for adults and children at home and abroad, but there are also index systems for evaluating the quality of NICU care. The system of indicators for evaluating the

quality of care has low validity, which does not allow for a realistic assessment of the quality of care for critically ill newborns. In order to effectively reflect the situation and characteristics of NICU nursing care, it is necessary to establish an index system for evaluating the quality of NICU nursing care in order to realize the effectiveness of NICU nursing care^[7]. Therefore, the necessary construction of the index system for evaluating the quality of NICU nursing care is essential for achieving sufficient reflection of the effect of NICU nursing care^[7-8]. Improvement is of great significance.

This study refers to a system of indicators for evaluating the quality of care for adults and children, as well as for critical care, and then Preliminary construction of 67 indicators for evaluating the quality of care for critically ill newborns, based on the actual situation of critically ill newborns, which will be used in consultation with the relevant experts. Afterwards, the necessary definitions of these indicators are implemented, taking into account the needs of the actual care process, after the first round of expert consultation. Following the questionnaire consultation exercise, eight of the indicators were deleted and one of them was split, and four were added. Revision of 4 indicators and the final consolidation of 2 of them, thus targeting the initial 67 critical neonatal care units established. The rate of change in the quality assessment indicators was 28.4 per cent (19/67). Thus, it appears that neither the quality of care indicators for adults or children nor the quality of care for critically ill newborns are more accurate. Reflects the actual quality of care for newborns. The second round of expert consultation on the questionnaire resulted in the deletion of five of the indicators and no corresponding changes, additions, disaggregations, or changes to the indicators. operations such as merging, which adequately describes the quality assessment of critical neonatal care developed after two rounds of expert questionnaire consultation. The indicators have achieved more satisfactory results^[9].

Because the position of each indicator in the overall system of quality indicators for critical neonatal care is significantly different. Therefore, the actual operation of the evaluation indicators can not be achieved simply add up, but in accordance with the nursing quality evaluation indicators. The calculations are carried out in relation to the actual importance of the thing being evaluated. A weight is

a numerical value that adequately reveals the relative importance of the thing being evaluated. Furthermore, the way in which weights are constructed has a crucial influence on the actual quality of care evaluation data for critically ill neonates^[8]. Therefore, the scientific determination of the weights is of strategic importance. In this study, a hierarchical analysis was applied in addition to the consultative scoring method, which is essential for the effective development of evaluation indicators at all levels. This is a clear boost to the results. Hierarchical analysis enables the necessary comparison of the relevant influencing factors to ensure that the results are sufficiently significant. Reasonable, and then the expert's judgment to implement the corresponding processing work, effectively alleviate the contradiction between the weight prediction and the actual situation. The study used hierarchical analysis on 75 indicators to achieve the corresponding portfolio weights, resulting in seven level 2, seven level 3, seven level 4, and seven level 5 indicators. A CR of less than 0.1 for each of the 9 primary and 9 tertiary indicators indicates a clear compliance with satisfactory Consistency is required^[10].

In summary, the criteria for evaluating the quality of NICU care should take into account the quality of the nursing process, the individual growth outcomes of newborns, the NICU care management system and other factors. In addition, the quality of care in the NICU should be based on the actual work index, because hospitals with different conditions have different requirements. There is also significant variation in the level of management categories for critically ill newborns, so a uniform system of evaluation indicators should not be used and should be based on Effective changes to the actual situation.

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