The Application of Case Simulation and Participatory Feedback in Neonatal Resuscitation Teaching

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Abstract: Objective: To analyze the value of case simulation combined with participatory feedback teaching method applied in neonatal resuscitation teaching. **Methods:** The study was carried out on the neonatal resuscitation technicians (60 cases) who were admitted to the department from 2023.2 to 2024.7. After the trainers were randomly grouped, the impact of the application of the traditional teaching mode (30 cases in the control group) and case simulation and joint participatory feedback teaching method (30 cases in the observation group) on the training effect was compared. **Results:** Compared with the control group, the post-training assessment scores and neonatal resuscitation practice ability scores of the observation group were elevated, and the difference was statistically significant, $P < 0.05$; compared with the control group, the post-training scores of initial resuscitation, equipment and instrumentation operation, positive-pressure ventilation, chest compression, medication-assisted therapy, and resuscitation assessment and operation self-confidence of the observation group were elevated, and the difference was statistically significant, $P < 0.05$. **Conclusion:** case simulation and joint participatory feedback teaching method were used in the training of 30 cases. The application of simulation and participatory feedback teaching method can strengthen the clinical training effect of neonatal resuscitation skills, help the trainees to effectively master the skills and actively realize the transformation of clinical theoretical knowledge, and optimize the related clinical operation confidence.

Keywords: case simulation; participatory feedback teaching; neonatal resuscitation; clinical teaching

1. Introduction

The survival and health of newborns is one of the key elements of the global sustainable development goals established by the United Nations. According to the World Health Organization, many of the causes of neonatal deaths can be avoided through simple, practical, cost-effective and appropriate techniques, and neonatal resuscitation is one of them. Neonatal resuscitation is an important life-support technique to help and ensure a smooth transition at birth. Standardizing neonatal resuscitation can greatly reduce the incidence of neonatal asphyxia and mortality. [1]

In the clinical training of neonatal resuscitation technology, influenced by factors such as the diversity of operation skills and the specificity of neonatal rescue operation, the traditional clinical teaching mode is not effective in its practical application, and should be reasonably adjusted in combination with the above characteristics in order to realize the effective learning and mastery of relevant skills of the trainees. Regular resuscitation training and assessment should be institutionalized, focusing on the operational rehearsal of resuscitation skills, and recommending case simulation and participatory feedback as the main form of training[2]. Therefore, in order to analyze the application value of case simulation and participatory feedback teaching method in neonatal resuscitation teaching, the study is carried out as follows:

2. Information and methodology

2.1 General information

The study was carried out with those who were admitted to the department to receive training in neonatal resuscitation techniques (60 cases) from 2023.2 to 2024.7, and the trainers were randomly grouped into 30 cases in the control group and 30 cases in the observation group. There was no statistically significant difference in demographic information between groups ($P > 0.05$), and the results of the study were comparable.

Inclusion criteria: compliance with departmental neonatal resuscitation training requirements; informed, confirmed enrollment, signed consent form. Exclusion criteria: did not complete the full course of training; voluntarily withdrew during the training period; pregnant and lactating trainees.

2.2 Methodology

Control group: receive training under the traditional teaching mode. Single training are 5~6 people/group, training time

is 1 month, 2 neonatologists take turns to be responsible for completing the teaching, class schedule for theory teaching (4 hours), neonatal resuscitation process practice teaching (2 hours) and neonatal resuscitation skills, equipment application operation practice teaching (4 hours).Observation group: trained in case simulation and participatory feedback teaching method. The number of single training personnel, training time and the number of teaching doctors were the same as above; (1) teaching preparation: based on the previous neonatal asphyxia treatment, selecting typical cases to build teaching simulation scenarios by using high-fidelity simulators and related therapeutic equipment, and adjusting the time schedule in combination with the time demand for teaching. (2) Training and teaching: the actual teaching process is arranged as follows: neonatal resuscitation theory knowledge (2 hours), resuscitation operation (2 hours), resuscitation assessment (2 hours), and comprehensive operation in the simulation scene (4 hours). Based on the typical clinical cases to create courseware, complete the neonatal resuscitation indications, diagnosis and treatment support and other related theoretical knowledge teaching, and then combined with the typical cases of clinical design of different simulation scenarios after the use of high simulation simulation to complete the neonatal resuscitation operation, resuscitation assessment of the practice of teaching, by the teacher in charge of teaching based on the teaching problem to be real-time feedback. During the comprehensive operation teaching in simulation scenarios, complex neonatal simulation scenarios are designed, and each trainee completes independent neonatal resuscitation comprehensive operation and team cooperation comprehensive operation practice of neonatal resuscitation in randomized groups (2~3 persons/group), and the teacher observes and evaluates the operation situation, and explains and corrects the operation problems in detail, and then the trainee repeats the practice operation until mastering the operation method.

2.3 Observation indicators

(1) Training assessment results: at the end of the training organized by the department of the trainer to accept the assessment, including theoretical achievements, clinical skills and teamwork ability of three. Theoretical achievements are assessed in written form, with a total assessment score of 50 points; operational skills, teamwork ability to take high simulation simulators to complete the practical assessment, with a total assessment score of 30 points and 20 points in turn. The above scores are positively correlated with the trainers' theoretical knowledge, mastery of clinical operation skills and teamwork ability. (2) Neonatal resuscitation clinical practice ability score: Based on the clinical problem discovery, problem handling, cooperation and coordination ability and problem solving effect score during the practical assessment, the total score of each item is 0-10 points, and the score is positively correlated with the corresponding ability level. (3) Neonatal resuscitation operation self-confidence score: based on the clinical operation of neonatal resuscitation in the "China Neonatal Resuscitation Guidelines (2021 Revision)", complete the clinical operation self-confidence score assessment, including preliminary resuscitation, equipment and instrumentation operation, positive-pressure ventilation, chest compression, medication-assisted therapy, resuscitation assessment, a total of 6 items, the total score of 0-5 points, scores are positively correlated to the level of self-confidence of the examinee's operation. The scores were positively related to the level of self-confidence of the examinees in the operation.

2.4 Statistical methods

By SPSS25.0 software to complete the data difference analysis, with ($\overline{x} \pm s$) indicates continuous variable information (including training assessment results, neonatal resuscitation clinical practice ability and operation confidence scores), consistent with the normal distribution line t-test; such as $P < 0.05$, the difference is statistically significant.

3. Results

3.1 Comparison of training and assessment scores between the two groups

Table 1: The training and assessment scores of the observation group were higher than those of the control group, $P < 0.05$.

Table 1. Comparison of training and assessment scores between the two groups ($\overline{x} \pm s$, in points)

Groups	Number of examples	Theoretical scores	Clinical Operational Skills	Teamwork skills
Control group	30	42.05±2.31	19.45±2.14	13.74±1.85
Observation group	30	47.42±2.05	24.08±2.25	16.29±2.04
t-value		9.523	8.167	5.072
P-value		<0.001	<0.001	<0.001

3.2 Comparison of neonatal resuscitation practice competency scores between the two groups

Table 2: Clinical practice competency scores of the observation group were higher than those of the control group, P < 0.05.

Table 2. Comparison of neonatal resuscitation practice scores between the two groups ($\overline{x} \pm s$, in points)

Groups	Number of examples	Problem identification	Problems addressed	Ability to cooperate and	Effectiveness of problem solving
Control group	30	7.12±1.07	7.04±0.97	7.08±1.03	7.15±0.95
Observation group	30	9.08±0.78	9.12±0.65	9.05±0.81	9.07±0.82
t-value		8.108	9.757	8.235	8.379
P-value		<0.001	<0.001	<0.001	<0.001

3.3 Comparison of neonatal resuscitation operation confidence scores between the two groups

Table 3: Neonatal resuscitation operation confidence score of the observation group was higher than that of the control group, P < 0.05.

Table 3. Comparison of neonatal resuscitation operation confidence scores between the two groups ($\overline{x} \pm s$, in points)

Groups	Number of examples	Initial resuscitation	Operation of equipment and instruments	Positive pressure ventilation	Chest compressions	Medication-assisted treatment	Recovery assessment
Control group	30	3.12±0.45	3.08±0.39	3.11±0.42	3.17±0.38	3.15±0.41	3.34±0.37
Observation group	30	4.72±0.24	4.68±0.21	4.75±0.18	4.65±0.24	4.68±0.22	4.71±0.23
t-value		17.183	19.785	19.658	18.036	18.010	17.224
P-value		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

4. Discussion

Neonatal resuscitation technology as a clinically important type of first aid technology, can be given to neonatal asphyxia after timely, standardized treatment, reduce the risk of death, to protect the health and safety of children, but how to achieve effective teaching and training of related technology, need to be combined with the clinical characteristics of the technology to reasonably select the teaching mode. In order to ensure the effective treatment of neonatal asphyxia, neonatal resuscitation treatment to carry out the timeliness, effectiveness, standardization has a very high demand, so it is necessary to pay attention to the current stage of clinical training and teaching of the trainee's operating skills, experience of effective teaching, accumulation, and should pay attention to the quality of practical teaching .

The results of the study show that: (1) compared with the control group, the observation group's theoretical scores, clinical operation skills, teamwork ability assessment scores and scores of problem discovery, problem handling, cooperation and coordination ability, and problem solving effect scores increased after the training, and the difference is statistically significant, P < 0.05. Analyzing the results of the above study, it can be seen that neonatal resuscitation technology requires the operators to have a wealth of experience in clinical operation to ensure that the first aid operation is standardized. Therefore, in the actual teaching and training of neonatal resuscitation, after combining the design of typical cases of neonatal resuscitation with the corresponding simulation scenarios, the use of high simulation simulators and clinical first aid equipment will help the trainees to actively realize the effective teaching of neonatal resuscitation technology in all kinds of scenarios in order to improve the quality and effect of teaching. (2) Compared with the control group, the observation group's scores of initial resuscitation, equipment and instrument operation, positive pressure ventilation, chest compression, drug-assisted therapy, and resuscitation assessment and operation self-confidence increased after the training, and the difference was statistically significant, with a P<0.05. Analyzing the above results, it can be seen that compared with the traditional teaching, the application of the case simulation combined with the participatory feedback method can be used in the arrangement of the adequate practical teaching and the timely feedback of the practical teaching of the various operations. The timely feedback of the operation situation can help the trainees to further refine the learning effect of clinical operation under the feedback and gradually build up the self-confidence of neonatal resuscitation operation under the perfect clinical ability training.In summary, the application of case simulation and participatory feedback teaching method can strengthen the clinical training effect of neonatal resuscitation skills, help the trainees to effectively master the skills and actively realize the transformation

of clinical theoretical knowledge, and optimize the degree of confidence in relevant clinical operations.

References

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