

# PROBLEM SITUATION: AN ACTIVE METHODOLOGY WITH OPERATING ROOM NURSES FOR EDUCATIONAL PROCEDURE ABOUT ANESTHESIA

*Situação problema: metodologia ativa para ação educativa sobre anestesia com enfermeiros de centro cirúrgico*

*Situación problema: metodología activa para la acción educativa sobre anestesia con enfermeros del centro quirúrgico*

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**ABSTRACT: Objective:** To test an educational procedure among operating room nurses in order to discuss care limitations during anesthesia. **Method:** A descriptive study about a problem situation based on problem-based learning. A sample composed of 19 nurses that were divided into three groups which resulted in two meetings for a survey, problem resolution and concept synthesis. **Results:** In the first meeting, problem limitations were identified in relation to care organization, knowledge, professionals' training for care practice and problems in the work process, which influenced the nurses' actions. In the second meeting, the formulated questions were answered according to the literature review about anesthesia, care protocols and uniformity of actions. More than half of the nurses investigated considered that the activity contributed as a means to reflect on the nurses' actions in anesthesia, daily activities and professional attitudes as well as on the need for involvement with care and review of concepts. **Conclusion:** The use of problem situation as a methodology for education in nursing supported the conceptual discussions among nurses about anesthesia and the reflection on performance in the operating room.

**Keywords:** Education, continuing. Problem-based learning. Anesthesia. Operating room nursing. Professional practice.

**RESUMO: Objetivo:** Testar uma ação educativa entre enfermeiros de centro cirúrgico para discutir as limitações na assistência durante a anestesia. **Método:** Estudo descritivo de uma situação problema fundamentada na aprendizagem baseada em problemas. Amostra composta de 19 enfermeiros, divididos em três grupos, com a realização de dois encontros para levantamento, resolução de problemas e síntese de conceitos. **Resultados:** No primeiro encontro, identificaram-se problemas relacionados a operacionalização da assistência, conhecimento e treinamento dos profissionais para execução de cuidados e problemas no processo de trabalho, que impactam as ações dos enfermeiros. No segundo encontro, responderam-se às questões elaboradas com base na revisão de literatura sobre anestesia, diretrizes de cuidados e uniformidade de condutas. Mais da metade dos enfermeiros avaliou que a atividade contribuiu para refletir sobre as ações do enfermeiro na anestesia, as atividades diárias e a postura profissional, a necessidade de envolvimento com a assistência e a revisão de conceitos. **Conclusão:** O uso da situação problema como metodologia para educação em enfermagem favoreceu a discussão sobre conceitos de anestesia entre os enfermeiros e a reflexão sobre a atuação em sala cirúrgica.

**Palavras-chave:** Educação continuada. Aprendizagem baseada em problemas. Anestesia. Enfermagem de centro cirúrgico. Prática profissional.

**RESUMEN: Objetivo:** Probar una acción educativa entre enfermeras de un centro quirúrgico para discutir las limitaciones en la atención durante la anestesia. **Método:** Estudio descriptivo de una situación problemática, basado en el aprendizaje basado en problemas. Muestra compuesta por diecinueve enfermeros, divididos en tres grupos, con dos reuniones de encuesta, resolución de problemas y síntesis de conceptos. **Resultados:** En la primera reunión se identificaron problemas relacionados con dificultades en la operacionalización de la atención; conocimiento y formación de profesionales para realizar cuidados; y problemas en el proceso de trabajo, que impactan la acción de enfermeros. En el segundo encuentro se respondieron las preguntas

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elaboradas a partir de la revisión de la literatura sobre anestesia, pautas de atención y estandarización de conducta. Más de la mitad de los enfermeros evaluaron que la actividad contribuyó a reflexionar sobre las acciones de los enfermeros en anestesia, acciones cotidianas y postura profesional, la necesidad de involucramiento con el cuidado y revisión de conceptos. **Conclusión:** El uso de la situación problema como metodología para la formación en enfermería favoreció la discusión sobre conceptos de anestesia entre enfermeros y la reflexión sobre el trabajo en quirófano.

**Palabras clave:** Educación continua. Aprendizaje basado en problemas. Anestesia. Enfermería de quirófano. Práctica profesional.

## INTRODUCTION

In contrast with the traditional teaching method, based on classes and memorizing knowledge obtained passively and with individual reflection, the problem-based learning (PBL) emerged 50 years ago at the McMaster University Medical School and was founded on active learning with collective reflection in small groups to formulate knowledge and strategies that allow the shared resolution of tasks<sup>1</sup>.

The PBL is based on the principles of engagement in learning, generating interest in solving real-life problems, reflection on prior knowledge and observations through self-inquiry, construction of knowledge through self-learning and self-assessment<sup>2</sup>. Learning is therefore self-directed by a teacher/advisor, and, by means of group discussions, reasoning strategies are used to combine and synthesize information about a problem or situation, allowing the elaboration of explanatory hypotheses.

In the nursing education process, PBL improves mainly critical thinking, knowledge, autonomy and student satisfaction with learning, in addition to developing an attitude of active search, ability to work as a team, motivation and ability to solve problems<sup>3</sup>.

In the context of in-service education, the use of active methodologies in continuing education of nurses can facilitate the addition of updated concepts to prior knowledge, allowing for significant and critical learning<sup>4</sup>.

Being an active learner and keeping oneself informed of current knowledge are necessary characteristics for nurses. PBL offers a holistic perspective of a problem, considering an approach focused on the individual, on the environment affecting the person's health and on specific issues that relate to nursing strategies for health management and promotion<sup>5</sup>.

## OBJECTIVE

To test an educational procedure with operating-room (OR) nurses to discuss the limitations in assistance during anesthesia.

## METHOD

This is a descriptive study of the process of applying a problem situation as an educational strategy to discuss nursing care during anesthetic procedure among OR nurses in a private hospital in the city of São Paulo, Brazil.

A problem situation has a clear and neutral description of an event or sets of phenomena that represent a practical reality and need to be explained in terms of processes, principles or mechanisms. The problem must be written to achieve certain educational goals, encouraging participants to study content that is relevant to their educational goals, discuss in groups and then present results<sup>6</sup>.

The problem situation task is applied in groups of eight to ten participants, mediated by a tutor/professor. Individuals are presented with a pre-elaborated problem, and the discussion takes place in two phases: first, the participants elaborate learning objectives based on the discussion of the problem; then, after an individual study, the subjects re-discuss the problem, taking into account new knowledge acquired<sup>7</sup>. Thus, the methodological steps of the problem situation are: reading the problem and clarifying terms or expressions; defining the problem to be evaluated; formulating explanations or hypotheses, elaborating learning questions to search for information in the scientific literature that test the formulated hypotheses; building new knowledge and meanings through a knowledge synthesis of the new information obtained, and review of initial hypotheses<sup>6,7</sup>.

In the OR of the hospital, the team of clinical nurses had 20 professionals. After guidance on the study, 19 nurses agreed to participate in the educational action.

The educational activity took place in January 2018, with two two-hour meetings and a seven-day break between them. The nurses were divided into three groups: two with six nurses and one with seven nurses, according to their work shift. The meetings took place in a training room at the OR of the hospital.

The researcher was experienced with problem situations aimed to learning perioperative nursing, as she was a

member of the nursing school residency in OR of the institution where the research was conducted, whose teaching strategies are all based on active methodologies.

In the first meeting, the researcher presented the problem situation to the nurses; then, a group discussion was held to raise the problems highlighted and to elaborate learning questions to be searched in the scientific literature.

Seven days after the first activity, the researcher held a new meeting with the groups of nurses, in which the participants presented information obtained in the literature and answered the questions elaborated in the first meeting, aiming to update the concepts about anesthesia and standardize the care actions provided daily by the professionals.

## Description of the problem situation

The problem situation was elaborated by the researcher, based on the care needs of patients undergoing general anesthesia and on a previous study that described the role of nurses during the three moments of anesthesia<sup>8</sup>. Thus, the case described was:

*You are a nurse in the OR and will prepare it for patient AJS, 65 years old, who will undergo a unilateral total hip arthroplasty procedure. The patient has arterial hypertension and type I diabetes, being classified in the pre-anesthetic evaluation as having a difficult airway.*

*The anesthesiologist who will perform the procedure informed that he will apply combined general anesthesia, central catheter puncture and invasive blood pressure monitoring. While preparing the OR, you identified that the anesthesia equipment had partially violet soda lime, that there was no flowmeter in the gas sources, that the control of the operating table was not in the room and the alarms of the multiparameter monitor were turned off.*

*The patient was admitted to the OR, and the professional who performed the transport informed you that the blood type test prescribed by the doctor was not collected and that the patient did not bring a preoperative hip MRI.*

*The anesthesiologist starts the anesthetic induction and, at the time of intubation, asks you to perform the Sellick maneuver. Intubation occurred after four attempts, with a minimum saturation of 65% and confirmation of intubation through capnography, as there was no stethoscope in the room.*

*At the end of surgery, the anesthesiologist extubates the patient and requests the transport monitor. The patient has blood pressure 90 x 50 mmHg, saturation (Sat) O<sub>2</sub>: 92%, with an O<sub>2</sub> catheter at 5 L/min, heart rate: 110 bpm, output of 50 mL in the lower limb*

*drain and urinary catheter with output of 100 ml. You assist in transferring the patient to bed and inform the medical team that you will not be able to accompany until the intensive care unit, as you are being requested in another room.*

*In view of the situation presented, discuss the problems identified as a group and formulate learning questions to be searched in the scientific literature.*

Data were analyzed according to the content provided by the participants. During the meetings, the researcher wrote down all the problems, hypotheses and learning questions raised by the professionals along with answers to them.

The content presented by the nurses was grouped according to the common themes identified in each group. The study met all ethical criteria for research involving human beings and was approved by the Research Ethics Committee of the Nursing School of Universidade de São Paulo, under CAAE 75167317.0.0000.5392 and opinion 2.340.000.

## RESULTS

Nineteen nurses participated in the research, of which 17 (89.47%) were females, with mean age of 33.26 years. The educational action was carried out with three groups of professionals in two two-hours meeting taking place with an interval of seven days.

In the first meeting, the researcher presented the problem situation, encompassing actions performed in all moments of general anesthesia. After discussing the case, the nurses identified problems related to the difficulties in operationalizing the assistance, knowledge and training of professionals for the execution of care and problems in the work process that impact the nurses' activities. At the end of the first meeting, the professionals raised the learning questions to be researched in the scientific literature (Chart 1).

The nurses reported, in the first meeting, that a problem situation in continuing education was a new opportunity that reflected the practical experiences and daily challenges of nurses in anesthesia care, allowing for individual and team self-reflection on attitudes that impact the care for the surgical patient.

In the second meeting, the nurses presented the answers to the learning questions obtained from the literature search, and the concepts about nursing care in anesthesia and its limitations in daily practice were reviewed and updated.

The nurses participated in the discussions by establishing the learning questions in the first meeting and answering

them after searching scientific articles and, mainly, by consulting the care guidelines of medical and nursing specialist societies, as well as institutional protocols of the hospital.

When evaluating the activity in the second meeting, ten (52.6%) nurses reported that it contributed to a reflection on the role of nurses in anesthesia, as they could discuss their daily actions and professional posture, the need for involvement with care and uniformity of knowledge, in addition to the limitations of actions, due to inadequate staffing to supply the needs of patients.

Ten (52.6%) nurses stated that the task offered them an opportunity to review concepts with scientific foundation. However, eight (42.1%) of them reported difficulty in finding answer the questions prepared in the first meeting through scientific articles found in databases.

## DISCUSSION

The discussion of concepts by nurses was the basis for obtaining new meanings about their role in anesthesia, considering that professionals had previous knowledge about the procedure and worked in the operating room daily.

During the educational procedure, nurses could identify the relevance of their role in the perioperative assessment of a patient, in the definition of intraoperative care and assistance during the anesthetic procedure, providing materials and care during periods of anesthesia.

The nurses' analysis of the problem situation raised questions about the difficulties to operationalize care, the need for knowledge and training of professionals aiming at quality, and the problems in the work process that influence nurses' activities during anesthesia. There was also a time for discussion between professionals about care needs during anesthesia and the importance of introducing a care protocol.

Nurses also recognized the importance of keeping themselves updated, but reported limitations in the search for information in the literature to support daily practice and encourage critical thinking for improvements in their workplace. Continuing education strategies not always favor the learning of professionals who are in practice, as they need to manage their workload and study time; education systems are not very flexible, with scheduled lectures that do not take into account working hours or the gap between theory and practice<sup>9</sup>.

The lack of updating about the most recent evidence in their area of expertise and the follow-up of institutional care

protocols, disconnected from a critical reflection on the scientific foundation of the developed actions, limit the transformation of clinical practice and lead to care that is little reflective, based only on institutional norms and routines.

In this context, active teaching-learning methodologies have been used for education and training in health<sup>7</sup>, being included in undergraduate nursing courses and bringing greater motivation, interest and involvement of students, faster completion of studies with a lower dropout rate, greater retention of knowledge, development of professional skills and competences, and a stronger connection between theory and practice, integrating knowledge from different disciplines<sup>10</sup>.

A study pointed out that changing educational practices with new methodologies such as PBL with nursing students contributed to developing skills for communication with patients and other professionals in the health team, aspects that can favor the effectiveness of care and a better patient-nurse relationship<sup>11</sup>. Added to this, the student takes an active role in decision-making regarding the cases and problems presented, which allows them to develop significant professional skills such as teamwork, planning, communication and critical thinking<sup>12</sup>.

PBL promotes clinical reasoning by increasing self-efficacy in self-learning, using clinical reasoning and problem-solving pathways while transferring skills to clinical practice, building team knowledge, and developing leadership skills. It helps nursing students to become independent learners who are motivated to seek new information, relying more on problem-solving skills than on experience<sup>13</sup>.

However, since the beginning of PBL, educational institutions and teachers also faced difficulties during the implementation of this methodology, involving a series of experiments, failures and lessons learned, with emphasis on the preparation of a tutor when developing activities and gathering groups during teaching activities<sup>1</sup>.

In clinical practice, the continuing education of nurses in health organizations should be part of both the thinking and acting of professionals, with the objective of promoting personal and professional growth, contributing to organize care. It should favor the development of innovative agents that can transform their reality, allowing to produce changes, strengthen reflection in action, teamwork and the ability to manage work<sup>14</sup>. Thus, four factors can influence the impact of permanent education by health institutions: the organizational culture, to align between development plans for individual needs of professionals and organizational needs; the partnership, where

**Chart 1.** Problems identified in the problem situation, explanatory hypotheses, learning questions and answers elaborated by groups 1, 2 and 3.

Problems identified	Problem category	Explanatory hypotheses	Learning questions	Answers to learning questions
Pre-induction period				
- Inadequate preoperative preparation: lack of blood type test and examination (GROUPS 1, 2 and 3).	Operationalization of assistance	<ul style="list-style-type: none"> <li>- Lack of communication within the preoperative team leads to inadequate care planning (GROUPS 1, 2);</li> <li>- Inadequate patient preparation can lead to intraoperative risk (GROUP 3).</li> </ul>	<ul style="list-style-type: none"> <li>- How is the communication between care teams made in face of the surgical patient? (GROUP 1);</li> <li>- What are the difficulties encountered in preparing the preoperative patient? (GROUPS 2, 3).</li> </ul>	<ul style="list-style-type: none"> <li>- Importance of patient assessment at all stages of the perioperative period, with the application of SPNC (GROUP 1);</li> <li>- Difficulty in communication between the inpatient unit and the surgical center nurse in exchanging information about the patient's preoperative assessment and continuity of care; reduction of failures with the recording of patient information and items sent to the operating room (GROUPS 2, 3).</li> </ul>
- Patient's clinical conditions (age, hypertension, diabetes, DA and high-complexity surgery (GROUPS 1, 2 and 3).	Professional knowledge	<ul style="list-style-type: none"> <li>- Unavailability of DA materials and equipment increases the risk of anesthetic complications (GROUP 1, 2);</li> <li>- Presence of risk factors increases the possibility of complications with the patient (GROUP 3).</li> </ul>	<ul style="list-style-type: none"> <li>- What defines DA and what materials are needed? (GROUPS 1, 2, 3);</li> <li>- What are the main risk factors that can cause complications in anesthetic induction? (GROUP 3).</li> </ul>	<ul style="list-style-type: none"> <li>- They described the criteria for classification of a patient with DA, considering the Mallampati, Comarch assessment and predictors (limited cervical mobility, dentition alteration, palate shape, thyromental distance, obesity). Among the materials, they mentioned the bougie guidewire, combitube, laryngeal mask, cricothyroidotomy needle, fast track mask, fiberscope, exchanger probe, flexible stylet and videolaryngoscope (GROUPS 1, 2 and 3);</li> <li>- They identified national guidelines on the importance of pre-anesthetic assessment to identify risk factors such as clinical and surgical history, use of medications, age (GROUP 3).</li> </ul>
- Inadequate operating room preparation: violet soda lime, flowmeter, monitor alarms off, operating table control, material for difficult intubation, stethoscope (GROUPS 1, 2 and 3).	Problems in the work process	- Inadequate operating room preparation can compromise patient safety during anesthetic induction and the performance of professionals (GROUPS 1, 2 and 3).	<ul style="list-style-type: none"> <li>- How can nurses contribute to anesthesia care? (GROUP 1);</li> <li>- What are the instruments needed to ensure proper preparation of the operating room? (GROUPS 2 and 3).</li> </ul>	<ul style="list-style-type: none"> <li>- Absence of guidelines for the work of nurses in Brazil in anesthesia, unlike the American practice (GROUP 1);</li> <li>- Importance of a checklist of materials needed in the operating room during the anesthetic-surgical procedure. The nurse must check the room setup, but there is difficulty in supervision due to the high number of rooms under their responsibility (GROUPS 2 and 3).</li> </ul>

Continue...

**Chart 1.** Continuation.

Problems identified	Problem category	Explanatory hypotheses	Learning questions	Answers to learning questions
Induction period				
<ul style="list-style-type: none"> <li>- Four intubation attempts (GROUP 1);</li> <li>- Four intubation attempts and O<sub>2</sub> saturation at 65%;</li> <li>- Hemodynamic instability of the patient in reversion of anesthesia (GROUP 3).</li> </ul>	Professional knowledge and training	<ul style="list-style-type: none"> <li>- Lack of knowledge and training of professionals about surgery and anesthesia impact care (GROUP 1);</li> <li>- Lack of evaluation and proper management by the multidisciplinary team in intra and postoperative periods can influence the patient's hemodynamic conditions (GROUP 3).</li> </ul>	<ul style="list-style-type: none"> <li>- What is the proper sizing of nursing team for the operating room? (GROUP 1);</li> <li>- What are the nurse's attributions in anesthetic induction? (GROUP 3).</li> </ul>	<ul style="list-style-type: none"> <li>- Nurses must manage up to four rooms, but they face limitations given their care and management role. The nurse must provide resources for the anesthetic procedure, assist in intubation, in the assessment of adequate ventilation and in the control of hemodynamic parameters with the anesthesiologist (GROUP 1);</li> <li>- Absence of a national guideline, but one care protocol initiative published (GROUP 3).</li> </ul>
Reversion period				
<ul style="list-style-type: none"> <li>- Nurse's absence during transport to the intensive care unit and patient instability (GROUPS 1, 2 and 3).</li> </ul>	Operationalization of assistance	<ul style="list-style-type: none"> <li>- The absence of a nurse during patient transport can compromise patient safety (GROUPS 1, 2 and 3).</li> </ul>	<ul style="list-style-type: none"> <li>- How to carry out safe transport of critical patients? (GROUPS 1 and 2);</li> <li>- What is the proper sizing of the nursing team in the operating room? (GROUP 3).</li> </ul>	<ul style="list-style-type: none"> <li>- The transport of patients must take place after the nurse's assessment, considering hemodynamic conditions; no guideline for mandatory nurse presence, but follow-up is suggested, in addition to monitoring and adequate ventilatory support (GROUPS 1 and 2);</li> <li>- The dimensioning in the operating room, in addition to the number of rooms, must also consider the severity of each patient (GROUP 3).</li> </ul>

SPNC: systematization of perioperative nursing care; DA: difficult airway.

there is integration between service needs, team and availability of relevant courses to improve the practice, the manager having a fundamental role in supporting his team; the support to a learning environment; and the improvement of practice by developing knowledge and skills<sup>9</sup>.

The literature points out that using active methodologies in continuing education of nursing professionals favors the development of technical skills for the establishment of safe practices and the promotion of professional knowledge, thus improving the quality of service provided<sup>15</sup>. Furthermore, when learning in small groups, professionals motivate each other to share knowledge in a collaborative way<sup>16</sup>.

The study presented as limitation the carrying out of research in a single surgical center. However, it is an initial step to reflect on the processes of continuing education in health services and their importance to improve nursing care practices.

Therefore, the change in teaching methods towards a more participative role of nurses in their own training and updating process contributes to active search for improvements in practice and changes in traditional paradigms, developing autonomy and strengthening the profession.

## CONCLUSION

An educational procedure for OR nurses, through the PBL, allowed the discussion of common themes in the anesthesia work routine, favoring the review of concepts about their daily practice. The problem situation, in turn, allowed a reflection on the difficulties faced by OR nurses during the anesthetic procedure and the importance of seeking improvements in daily actions.



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