THE IMPACT OF NURSE TRAINING IN CARDIAC SURGERY POSTOPERATIVE CARE

Impacto de uma capacitação para enfermeiros acerca da assistência no pós-operatório de cirurgia cardíaca

Impacto de una capacitación para enfermeros acerca de la asistencia en el postoperatorio de cirugía cardíaca

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ABSTRACT: Objective: To evaluate the impact of a theoretical training program for nurses in care for postoperative cardiac surgery patients. **Method:** Descriptive, quantitative study, conducted at a philanthropic hospital in the countryside of the state of São Paulo, and divided into three stages: application of a pre-test, training with active participation, and application of a post-test. **Results:** A total of 47 nurses participated in the study, most of them females, with 1 to 3 years of experience in nursing, and only 4 of them had experience in cardiac surgery. We observed a significant increase in the number of right answers on the test after the training program, in comparison with the pre-test. **Conclusion:** The study demonstrated the need for continuing education for nurses working in postoperative of cardiac surgeries. The theoretical training program for nurses proved to be significant but limited in terms of teaching-learning process.
Keywords: Postoperative period. Nursing care. Thoracic Surgery. Postoperative complications.

RESUMO: Objetivo: Avaliar o impacto de um programa de capacitação teórica para enfermeiros acerca dos cuidados ao paciente no pós-operatório de cirurgia cardíaca. **Método:** Estudo descritivo, quantitativo, realizado em um hospital filantrópico do interior do estado de São Paulo, dividido em três etapas: aplicação do instrumento de pré-teste, capacitação expositiva dialogada e aplicação do instrumento de pós-teste. **Resultados:** Participaram da pesquisa 47 enfermeiros, a maioria do sexo feminino, com experiência de 1 a 3 anos na enfermagem, e somente 4 enfermeiros com experiência em cirurgia cardíaca. Verificou-se aumento significativo no número de acertos na avaliação após a capacitação, no pós-teste em relação ao pré-teste. **Conclusão:** Foi evidenciada a necessidade de formação continuada para os enfermeiros atuantes no pós-operatório de cirurgias cardíacas. O programa de capacitação teórica para os enfermeiros se mostrou significante, porém limitado, no que tange ao processo ensino-aprendizagem.
Palavras-chave: Período pós-operatório. Cuidados de enfermagem. Cirurgia torácica. Complicações pós-operatórias.

RESUMEN: Objetivo: Evaluar el impacto de un programa de capacitación teórica para enfermeros acerca de los cuidados al paciente en el postoperatorio de cirugía cardiaca. **Método:** Estudio descriptivo, cuantitativo, cumplido en un hospital filantrópico del interior del estado de São Paulo, dividido en tres etapas: aplicación del instrumento de pre-prueba, capacitación expositiva dialogada y aplicación del instrumento de post-prueba. **Resultados:** Participaron de la investigación 47 enfermeros, la mayoría del sexo femenino, con experiencia de 1 a 3 años en la enfermería, y solamente 4 enfermeros con experiencia en cirugía cardiaca. Se encontró un aumento significativo en el número de aciertos en la evaluación después de la capacitación, en el post-prueba en relación a la pre-prueba. **Conclusión:** Se ha evidenciado la necesidad de formación continuada para los enfermeros actuante en el postoperatorio de cirugías cardíacas. El programa de capacitación teórica para los enfermeros se mostró significante, pero limitado, en lo que se refiere al proceso enseñanza-aprendizaje.
Palabras clave: Periodo posoperatorio. Atención de enfermería. Cirugía torácica. Complicaciones posoperatorias.

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INTRODUCTION

The health team is responsible for planning and discussing actions that provide quality care, in order to guarantee the quick recovery and early discharge for patients who undergo cardiac surgery. In the postoperative period, the nurse, aided by his or her team, is in charge of monitoring the anesthetic recovery (AR) and of paying attention to possible surgery complications, during the patient's stay at the Intensive Care Unit (ICU)[1].

To promote full, singular, and qualified care, nurses must integrate the nursing process into their daily routine, to systematize the assistance and adopt an evidence-based clinical practice[2]. In this regard, one of the phases of the nursing process that stands out is care prescription. Nurses must implement it according to their scientific knowledge and the individual needs of each patient, analyzed through data collection, preparation of nursing diagnoses, and care planning[1].

In this context, it is important that these professionals be often trained to develop their skills and abilities to identify the real needs of patients and effectively plan their care. Training in different areas has the purpose of updating and complementing the knowledge of the professional and allowing better performance of the participant. It is also a necessity in the health field, which experiences constant changes and requires permanent professional qualification of the nurse [3].

Consequently, the training of nurses working in cardiac surgery is extremely important, as this is one of the therapeutic possibilities adopted for cardiovascular diseases (CVD), known as the main cause of death in the world, with 17.5 million cases each year. A situation of great concern to health managers[4-6].

However, some cases require surgical treatment — a procedure that has been going through remarkable technological advances, in a quick and steadfast manner — to increase not only the survival, but also the quality of life of these patients after surgery.

Among the classes of cardiac surgeries, there is reconstructive, corrective, and replacement. Myocardial revascularization (MV) is the most common reconstructive surgery. Its purpose is to preserve myocardial function, and it may be performed with or without a cardiopulmonary bypass (CPB)[1].

CPB is a procedure used in most cardiac surgeries. It consists of the total cardiopulmonary bypass, temporarily replacing the pumping function of the heart and the ventilatory function of the lungs. The risk of complications, such as arrhythmias, ischemia, and changes in blood pressure levels, in the postoperative period is directly related to the time during which the patient is exposed to the CPB. The greater the time of exposure to the CPB, the greater the probability of patients presenting with prolonged neurological deficits, such as changes in cognitive and intellectual functions, and lethargy[2].

Therefore, patients who undergo cardiovascular surgery, especially those that use CPB, require systematic care in the postoperative period. They stay in the ICU for four days, on average, and the most frequent complications they suffer are the pulmonary ones[1,7].

The expansion of the Cardiovascular Surgery Service of a hospital institution in the countryside of the state of São Paulo prompted the idea of implementing this training program so as to meet the need to prepare nurses to satisfy the recent demand.

Accordingly, this research is important to evaluate a training method for nurses who assist the postoperative cardiac surgery patient, given that adequate support contributes to improving the quality of care after surgery.

OBJECTIVES

To evaluate the impact of a theoretical training program for nurses on care for postoperative cardiac surgery patients;

To assess the performance of the nurses before and after the application of the method.

METHOD

This is a descriptive and quantitative study of a theoretical training program for nurses from a hospital institution in the countryside of the state of São Paulo, regarding care for postoperative cardiac surgery patients. We divided the research into three stages:

1. application of the pre-test instrument;
2. theoretical training;
3. application of the post-test instrument.

We developed the data collection instrument (pre and post-test) based on the literature[2,8-13]. The first part

consisted of the sociodemographic characteristics of the participants. The second part included 14 questions related to the variables relevant to the theme of study: care in the pre, trans, and postoperative period of cardiac surgery. The topics discussed were mechanical ventilation, hemodynamic monitoring, drain care, dressing care, body temperature, drugs, pacemaker electrodes, the performance of laboratory tests and of electrocardiograms, precautions when performing a chest x-ray, and prevention of possible complications. After preparing the instrument, we submitted it to face validity.

Face validity has the purpose of evaluating if the data collection instrument agrees with what it intends to measure[14]. Five nurses — with Master's or Ph.D. degrees, and with experience in postoperative cardiovascular surgery — participated in this process. We selected the judges through "snowball or network sampling," and they received a formal invitation by e-mail[14].

The suggestions regarding the clarity of the wording and presentation of the alternatives were pertinent, and we followed the orientation of the judges. Relevant variables in questions regarding cardiac tamponade and care for a patient with intra-aortic balloon were included in the instrument[15,16].

We prepared the study protocol following the legal and ethical standards for research involving human beings, in compliance with Resolution no. 466/2012 of the National Health Council of the Ministry of Health and submitted it for consideration by the Research Ethics Committee of Universidade Federal de São Carlos (UFSCar), CAAE 46154915.0.0000.5504.

The participants authorized the use of the findings of this research by signing the Informed Consent Form (ICF), and the authors guaranteed the anonymity of the subjects.

After elaborating the project, the researchers organized a timeline and uploaded it to the system of the participating institution (Intranet) to ensure that all nurses had access to it.

There were four dates available, always in the afternoon, for completion of the training, and the professionals participated according to their preference. Each group had 12 nurses, on average.

We carried out this study in February, 2016, and counted on the participation of 47 nurses of the 63 who worked at the hospital institution. The inclusion criteria were: being a nurse, having a contract of employment with the institution head of research, accepting to participate in the study by signing the ICF, and completing all stages of training.

Stage 1 consisted of clarifying the research objectives to participants and of delivering the signed ICF, followed by the pre-test, which aimed at assessing their knowledge on the theme.

Stage 2 covered the theoretical training: a two-hour class with active participation and the assistance of texts, images, and videos. It was held in the auditorium of the institution using material resources present at the site, such as data projector, projection screen, and sound system. The two nurses who taught the classes were researchers from the study with experience in postoperative cardiovascular surgery.

Stage 3 was the application of the post-test, with the objective of identifying changes in the answers after the theoretical training and evaluating its effectiveness. In stages 1 and 3, which consisted of the application of the data collection instruments, participants had 45 minutes to answer the questions, both in the pre- and post-tests.

For the statistical evaluation, we conducted a descriptive and exploratory analysis, with the purpose of providing an overview of the general behavior of the data set, using the software R. We applied the Wilcoxon test to analyze the possible existence of a difference in the ratio of correct answers in the pre- and post-tests. With this information, we could evaluate if the performance of the professionals improved after the training process and measure this difference. The confidence level adopted was 5% ($p<0.05$).

RESULTS

A total of 47 nurses participated in this study. They were evaluated according to sociodemographic characteristics (Table 1).

The female gender was predominant in the study, and the age of 21 (44.6%) nurses was between 30 and 39 years. The length of professional experience for 22 (46.8%) subjects was between 1 to 3 years. Only 4 nurses (8.5%) reported having some training in cardiac surgery.

Table 2 shows the average of correct answers from the participants in the pre- and post-tests, in relation to the time of experience and the mean improvement after training. We observed that, in the pre-test, participants with 6 months of experience, on average, answered 8 questions correctly; the average for those with 1 to 3 years of experience was 6.68; 3 to 5 years, 5.7; 5

to 10 years, 5.12; and more than 10 years, 8.16. We can conclude that even among participants with more than 10 years in the profession — the highest average —, the time of experience did not influence the average number of correct answers. There was no gradual mean growth with the increasing time of experience.

After the training program, all the averages of correct answers increased in relation to the time of experience in Nursing (Table 2). The highest growth was among participants with 5 to 10 years in the profession (2.75), and the lowest among participants with more than 10 years of experience (0.167). The category of participants with six months of experience is not conclusive, since it has only one observation.

In Table 3, it is possible to notice that the variable related to severe complications in the postoperative period showed the highest number of correct answers among the participants in the pre and post-tests. The question with less correct answers corresponded to the recognition of the cardiac tamponade (question 14), with only four right answers in the pre-test and none in the post-test.

There was an increasing number of correct answers in most questions in the post-test in relation to the pre-test. The exceptions were question 9, about preload, which had 14 correct answers, and question 14, about the recognition of the cardiac tamponade, which had no right answers in the post-test. Question 1, regarding educational interventions, had one less correct answer in the post-test when compared to the pre-test. Question 13, on severe complications in the postoperative period, had the highest number of right answers after training (41). Questions 4, 6, 8, and 10 had an increase of more than 20% in the number of correct answers after the nursing training (Table 3).

In general, the number of right answers grew after the training program and had significance level ($p = 0.0037$). After the statistical analysis, we can conclude that the performance of the professionals improved after the theoretical training, as the results of the post-test demonstrated.

Table 1. Sociodemographic characteristics of the study participants. São Carlos, 2017.

Variable	n	%
Age Group (years old)		
20 to 29	18	38.2
30 to 39	21	44.6
40 to 49	05	10.6
50 to 59	03	6.3
Gender		
Female	40	85.1
Male	07	14.8
Length of professional experience		
6 months	01	2.1
From over 1 to 3 years	22	46.8
From over 3 to 5 years	10	21.2
From over 5 to 10 years	08	17.0
Over 10 years	06	12.7
Professional experience in cardiac surgery		
Yes	04	8.5
No	43	91.5
Total	47	100.0

DISCUSSION

The nursing professionals must constantly update their knowledge, since the health field experiences progressive transformations due to new scientific and technological findings. Faced with this situation, it is essential for the professionals to seek permanent improvement, so that they can provide qualified care, focusing on systematization and comprehensiveness[3].

Table 2. Average number of right answers from the participants in the pre and post-test in relation to the length of professional experience. São Carlos, 2017.

Length of professional experience	Quantity	Average pre-test	Average post-test	Increase after the test
6 months	01	8.0	9.0	1.0
1 to 3 years	22	6.681	7.27	0.589
3 to 5 years	10	5.7	7.2	1.5
5 to 10 years	08	5.125	7.875	2.75
Over 10 years	06	8.166	8.333	0.167

According to this logic, it is important for nurses to be one of the main agents of transformation in health work. They must develop skills in care, management, and leadership, as well as in education, prioritizing their continuous training and that of their team[3].

The study evaluated a theoretical training program for 47 nurses on care for postoperative cardiac surgery patients. It was conducted in a philanthropic hospital institution that performs a large number of cardiovascular surgeries in adult patients, such as tumor resection, aneurysm repair, aortic dissection, myocardial revascularization, and valve replacement.

However, the results of this study demonstrated that only 4 (8.5%) nurses had experience postoperative cardiac surgery care, corroborating other studies in which the professionals involved in the assistance of critically-ill patients had recent professional training, had no experience, or were looking for theoretical improvement. Nevertheless, these aspects are necessary for those who work in a complex area that requires the development of skills[17,18].

These nurses are usually more responsible professionals who take the initiative, so that they can fit in the critical care profile. They are always seeking to update and improve their knowledge by taking specialization courses, so they can become more competent when working in the care of critical patients[17,18].

Thus, as a preparation strategy, some institutions carry out training programs during the integration period of the Nursing professional, with the purpose of improving the care of the patients assisted. However, this is not a standard practice for all institutions. In addition, employees without prior experience are often transferred to more complex areas. Consequently, it is essential to stimulate these professionals to update themselves periodically, so that they can strengthen the knowledge acquired[3].

The nurses showed better performance after the theoretical explanation. The questions with the greatest variation were those related to intra-aortic balloon, myocardial revascularization, and administration of epinephrine. The reduced time for the application of the second test may have influenced this result, since the participants took the theoretical class on the same day of the test.

One of the most common methods for nurse training is active participation. In this method, the facilitator presents the theme and, concomitantly, allows the professionals to share prior experiences, in order to improve their knowledge and, consequently, the quality of patient care[19].

Nevertheless, this type of method, when applied alone, has some restrictions, such as reduced time frame to deepen the reflections; vertifcal transmission of ideas (teacher/student); and an evaluation process focused on

Table 3. Number of right answers from the nurses on care for postoperative cardiac surgery patients in the pre and post-test. São Carlos, 2017.

Variable	Pre-test		Post-test	
	n	%	n	%
1. Educational interventions in the preoperative period	38	80.8	37	78.7
2. Preoperative care	30	63.8	32	68.0
3. Mitral valve replacement	16	34.0	18	38.2
4. Myocardial revascularization	06	12.7	21	44.6
5. Equipment and materials in the postoperative period	31	65.9	35	74.4
6. Postoperative examinations	25	53.1	39	82.9
7. Priority interventions in the postoperative period	36	76.5	37	78.7
8. Cardiac output	21	44.6	31	65.9
9. Preload	24	51.0	14	29.7
10. Administration of noradrenaline	05	10.6	17	36.1
11. Intra-aortic balloon	05	10.6	11	23.4
12. Consequences of the increase in cardiac output	21	44.6	25	53.1
13. Severe complications in the postoperative period	40	85.1	41	87.2
14. Recognition of cardiac tamponade	04	8.5	0	0

the reproduction of the content offered[18]. Despite these limitations, the significance test was positive (p=0.0037) in the current study.

Although the results show satisfactory level of significance, the repercussions of this research involve new challenges for the development of knowledge and skills in the health work process. Thus, it questions if teaching-learning strategies with active methodologies can achieve better results when it comes to the process of continuous education in postoperative care for cardiac surgery patients, in contrast with the expository method to meet this demand.

Question 14, about the "recognition of cardiac tamponade", which is related to one of the postoperative complications of cardiovascular surgery, demonstrated a reduction in the rate of correct answers, even after training. The theoretical method offered may explain this result, once it does not favor reflection.

Based on this consideration, it is imperative to highlight the active methodology as a major trend in educational processes. Its popularity is owed to characteristics that include the individual's autonomy, learning with meaning, and questioning in search of solutions, resulting in a situation of action-reflection-action, capable of generating continuity or rupture processes. In the continuity process, the subject confronts the concepts learned with the knowledge acquired previously, whereas in the rupture process the student transcends his or her experiences through opportunities for new challenges[20].

In this context, we highlight questions 9 — about "preload" — and 14 — regarding "cardiac tamponade" — as limitations of the study, as both showed a decrease in the number of right answers in the post-test. This result indicates that there was a hindrance in the method applied to the training in regard to these issues, which are directly related to postoperative complications of cardiovascular surgery. Above all, we emphasize the need to implement active strategies that provide a better understanding of the theme.

CONCLUSION

The study demonstrated the need for continuing education for nurses working in postoperative care of cardiac surgeries. The theoretical training program for nurses proved to be significant. The number of right answers in the post-test had a substantial increase in relation to the pre-test (p =0.0037), despite the limitation of this value in terms of teaching-learning process.

We suggest further studies to evaluate training strategies for health professionals, highlighting the difficulty to find studies in the literature on training associated with care for postoperative cardiovascular surgery patients.

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