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RESEARCH

Stressors perceived by patients in the immediate postoperative of cardiac surgery

Estressores percebidos por pacientes no pós-operatório imediato de cirurgia cardíaca

Estresores percibidos por pacientes en el postoperatorio inmediato de cirugía cardíaca

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ABSTRACT

Objective: to investigate stressors perceived by patients in the immediate postoperative of cardiac surgery and their association with sociodemographic and clinical characteristics. **Method:** a prospective correlational study conducted in a city in São Paulo, between August 2013 and December 2014. A non-probabilistic sample included patients submitted to their first coronary artery bypass graft or mitral valve surgery. The "Environmental Stressor Questionnaire" adapted to Portuguese was used. **Results:** 105 patients participated in the study. The item "being thirsty" was evaluated as the most stressful and "the nursing staff member does not introduce himself/herself by the name" as the least stressful. Among sociodemographic and clinical variables (gender, age, type and time of surgery, pain, intubation time, use of psychotropic medications and length of stay in the intensive care unit), only pain presented a significant association with the stressors. **Conclusion:** knowing stressors can help implement practices associated with their reduction, favoring patients' recovery.

Descriptors: Thoracic Surgery; Physiological Stress; Intensive Care Units; Perioperative Nursing; Nursing Care.

RESUMO

Objetivo: investigar os estressores percebidos pelos pacientes no pós-operatório imediato de cirurgia cardíaca e sua relação com características sociodemográficas e clínicas. **Método:** estudo correlacional, prospectivo, desenvolvido no interior paulista, entre agosto/2013 e dezembro/2014. Uma amostra não probabilística foi constituída por pacientes submetidos à primeira cirurgia de revascularização do miocárdio e/ou correção de valvulopatias. Utilizamos a "Escala de Avaliação de Estressores em Unidade de Terapia Intensiva". **Resultados:** participaram 105 pacientes. O item avaliado como mais estressante foi "ter sede", e o menos estressante foi "membro da equipe de enfermagem não se apresentar pelo nome". Das variáveis sociodemográficas e clínicas investigadas (sexo, idade, tipo e tempo de cirurgia, dor, tempo de entubação, uso de psicotrópico e tempo na unidade de terapia intensiva), apenas dor apresentou relação significativa com os estressores. **Conclusão:** conhecer os estressores pode auxiliar na implementação de práticas relacionadas à sua redução, favorecendo a recuperação dos pacientes.

Descritores: Cirurgia Torácica; Estresse Fisiológico; Unidades de Terapia Intensiva; Enfermagem Perioperatória; Cuidados de Enfermagem.

RESUMEN

Objetivo: investigar los estresores percibidos por pacientes durante postoperatorio inmediato de cirugía cardíaca, y su relación con características sociodemográficas y clínicas. **Método**: estudio correlacional, prospectivo, desarrollado en el interior paulista entre agosto/2013 y diciembre/2014. Constituida muestra no probabilística con pacientes sometidos a primera cirugía de revascularización del miocardio y/o corrección de valvulopatías. Utilizamos la "Escala de Evaluación de Estresores en Unidad de

Terapia Intensiva". **Resultados**: participaron 105 pacientes. El ítem considerado como más estresante fue "tener sed"; el menos estresante fue "personal de enfermería no se presenta por su nombre". De las variables demográficas y clínicas investigadas (sexo, edad, tipo y tiempo de cirugía, dolor, tiempo de entubamiento, uso de psicotrópico y tiempo en unidad de terapia intensiva), solamente dolor mostró relación significativa con los estresores. **Conclusión**: conocer los estresores puede ayudar a implementar prácticas relacionadas con su reducción, favoreciendo la recuperación de los pacientes.
Descriptores: Cirugía Torácica; Estrés Fisiológico; Unidades de Cuidados Intensivos; Enfermería Perioperatoria; Atención de Enfermería.

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INTRODUCTION

Cardiac surgery is still the choice of intervention in many cases of cardiovascular diseases, despite the advance of the disease's clinical treatment in the last years and the advent of the minimally invasive approach. It is considered a major surgery, and in most cases, the use of extracorporeal circulation is necessary. Considering these characteristics, all patients submitted to cardiac surgery are referred to an intensive care unit (ICU) in the immediate postoperative period (IPP).

The ICU is a critical area dedicated for the hospitalization of critically ill patients who require continuous and specialized professional care, use of specific materials and technologies for diagnosis, monitoring and therapy[1]. ICU monitoring is necessary to optimize the postoperative recovery of these patients. The electrocardiographic trace and oxygen saturation are constantly monitored; measurement of blood pressure from invasive catheters, including the Swan-Ganz catheter, are continuously evaluated through multi-parameter monitors, besides the evaluation of losses of chest drains, volume of diuresis and results of laboratory tests. This specialized assessment aims to ensure the maintenance of hemodynamic stability after cardiac surgery.

Due to this reality, the ICU is considered a place that generates stress, where patients might present physical and psychological discomfort caused by environmental characteristics. Stress originates from the large number of equipment, professionals and procedures that often interrupt the circadian rhythm, causing harm for the patients' physiological recovery[2].

Stress is defined as an external or internal element that affects the normal condition of the dynamic balance in an individual (homeostasis), which can be physical or psychological. In face of stress, the body answers with certain intrinsic reactions, known as response to the General Adaptation Syndrome (GAS). Such response depends on intensity, quantity and quality of stressors[3].

This is an important aspect to be considered, since stressors are mostly subject to intervention, promoting better adaptation of patients to the ICU environment[4]. By reducing the patients' exposure to stressors present in the ICU, the physiological recovery of patients in the IPP of cardiac surgery is favored, minimizing response to the GAS.

Several authors investigated the perception of stressors by patients hospitalized in ICUs[4-7]; however, there is a shortage of production focused particularly on patients in the IPP of cardiac surgeries[8-10].

Therefore, the objectives of this study were to investigate the main stressors perceived by patients in the IPP of cardiac surgery and identify the possible associations of sociodemographic and clinical characteristics with this perception.

The evaluation of stressors present in ICUs by patients is a factor that can guide proposals of nursing interventions. Nurses should consider environmental aspects, dynamics and organization of the unit, with a focus on reducing stressors that influence the hemodynamic recovery of patients who underwent surgery in the critical period of surgery experience, which is the IPP of a cardiac surgery.

METHOD

The research project was approved by the Human Research Ethics Committee of the Ribeirão Preto College of Nursing. Each participant of the study was duly clarified about the research. A free and informed consent form was read and signed by the participants and the main researcher.

Design, place of study and period of data collection

A correlational and prospective study was conducted at a university hospital in a city in the state of São Paulo. Data were collected in the admission units of the surgical clinic and medical clinic of the referred hospital, between August of 2013 and December of 2014.

Sample, inclusion and exclusion criteria

A consecutive and non-probabilistic sample was composed of individuals of both genders, aged over 18 years, who were submitted to their first coronary artery bypass graft surgery (CABG) and/or mitral valve surgery, and whose surgeries were electively scheduled in the aforementioned period.

Patients who did not present cognitive conditions to answer the questionnaires evaluated by the Mini Mental State Examination (MMSE)[11], adapted to Portuguese language[12]; who presented clinical decompensation of the cardiac disease the day before surgery (dyspnea, precordialgia and orotracheal intubation); and who had elective surgeries scheduled within less than 12 hours in advance were excluded.

Study protocol

Data collection

Data were collected by individual interviews with the participants and by consulting records during their hospitalization. Sociodemographic and clinical characteristics were collected the day before the cardiac surgery. Data regarding

the anesthetic and surgical procedures, as well as the patient's evolution in the ICU were collected from the patient's medical records after their discharge from the ICU. The Environmental Stressor Questionnaire (ESQ)[13], adapted to Portuguese language[4], and hereinafter called *Escala de Avaliação de Estressores em Unidade de Terapia Intensiva* (as per its name in Portuguese, after adaptation) was used within 48 hours of the ICU discharge by means of individual interview for the evaluation of stressors in IPP.

A data collection tool containing sociodemographic (date of birth; gender; education level in complete years; marital status; performance of paid activities and monthly household income) and clinical variables (date of hospitalization; preoperative comorbidities; main diagnosis; performed surgery; presence of complications in the IPP; orotracheal intubation time; procedures performed in the IPP; use of psychotropic medications in the IPP) was elaborated and validated for the participants' characterization.

The age of the participants was calculated by deducting their date of birth from the interview date.

The use of psychotropic medications in the IPP was investigated because of the possibility of compromising the participants' evaluation regarding their own perception about stressors. This variable was collected from the patient's medical prescription.

The *Escala de Avaliação de Estressores em Unidade de Terapia Intensiva* is composed of 50 items evaluated by means of a five-point Likert scale: (1) not stressful; (2) moderately stressful; (3) very stressful; (4) extremely stressful and (0) not applied. The total score was obtained by means of the sum of the answers for the 50 items, with a possible range of 0 to 200, in which the higher the amount, the higher the stressor perceived by the patient. The mean for each of the 50 items was calculated and ranked from the most stressful to the least stressful (the higher the mean, the more stressful the item)[4].

Data analysis

All data were analyzed through the IBM SPSS 22 software for Windows (SPSS, Inc., Chicago, IL, USA). Descriptive analysis was used for all variables. Student's t-test was conducted for independent samples, to investigate the mean variations of stressors according to gender (female and male), age (adult and aged), type of surgery (CABG, mitral valve surgeries and CABG concurrently with mitral valve surgeries), surgical time, presence of pain in the IPP (yes or no), intubation time in the IPP, use of psychotropic medications in the IPP (yes or no) and length of stay in the unit. The median values found in this study were used for the dichotomization of the numeric variables "surgical time, intubation time in the IPP and length of stay in the unit". The level of significance adopted was 0.05.

RESULTS

In the data collection period, from August of 2013 to December of 2014, 186 cardiac surgeries were performed at the referred hospital. Of these total, 105 patients met the inclusion criteria and participated the study.

The sociodemographic and clinical characteristics of these 105 participants can be found in Table 1.

Table 1 – Sociodemographic and clinical characteristics of the 105 participants, Ribeirão Preto, São Paulo, Brazil, 2013-2014

Variables	n (%)
Gender	
Male	67 (63.8)
Marital status	
Married/living in consensual union	79 (75.2)
Performance of paid activities before hospitalization	
No	70 (66.7)
Mean age (in years) / Mean (SD) §	58.8 (12.3)
Categorized age	
Aged (≥ 60 years)	55 (52.4)
Education level (in complete years)/Mean (SD) §	5.4 (4.4)
Monthly household income (in Brazilian Real)/Median (SD) §	2455 (2615)
Hospitalization main diagnosis	
Coronary artery disease	55 (52.4)
Mitral valve disease	42 (40.0)
Coronary artery disease + mitral valve disease	8 (7.6)

Note: § Mean (SD) = Mean (Standard deviation)

Of the patients in surgical treatment of coronary artery disease (including those with coronary disease + mitral valve disease) (n = 63), 14 patients (22.2%) presented stable angina, 13 patients (20.6%) were diagnosed with recent acute myocardial infarction (AMI), 12 patients (19.0%) presented previous AMI and nine patients (14.3%) presented stable angina. The clinical presentation of the coronary artery disease was not described in the record of 15 patients (23.8%).

Of the 50 patients in surgical treatment of mitral valve diseases (including those with coronary artery disease + mitral valve disease), 26 patients (52.0%) presented stenosis and failure concomitantly, 15 patients (30.0%) only presented failure, eight patients (16.0%) only presented stenosis and in one case (2.0%) it was not possible to identify this aspect because it was not described in the patient's record. The aortic valve was the most injured (n = 23; 46.0%), followed by the mitral valve (n = 16; 32.0%), mitral and aortic (n = 10; 20.0%) and mitral, aortic and tricuspid (n = 1; 2.0%).

Regarding the presence of comorbidities of patients in the postoperative, patients already presented systemic arterial hypertension (n = 76; 72.4%), overweight and obesity (n = 63; 60.0%), dyslipidemia (n = 58; 55.2%), diabetes mellitus (n = 43; 41.0%), previous smoking (n = 38; 36.2%) and current smoking (n = 20; 19.0%).

The mean time of postoperative hospitalization was 12.4 days (SD = 9.4; median = 9.0), ranging from one to 40 days.

Regarding the type of surgery performed, 54 (51.4%) patients were submitted to CABG, 44 (41.9%) were submitted to mitral valve surgeries and seven (6.7) patients were submitted to CABG and mitral valve surgeries.

The main complications presented by patients in the IPP were: reduction of hemoglobin and hematocrit (n = 102; 97.1%), followed by hyperglycemia (n = 100; 95.2%), pain (n = 86; 81.9%), systemic arterial hypotension (n = 54; 51.4%), nausea (n = 44; 41.9%), systemic arterial hypertension (n = 35; 33.3%), vomit (n = 28; 26.7%), fever (n = 28; 26.7%), psychomotor agitation (n = 22; 21.0%), arrhythmia (n = 22; 21.0%), acute renal failure (n = 8; 7.6%) and bleeding (n = 7; 6.7%).

With respect to the orotracheal intubation time in the ICU, the patients remained intubated for a mean of 16.7 hours (SD = 22.8; median = 12.0), ranging from two to 187 hours.

Most of the patients received psychotropic medication in the IPP (n = 85; 81.0%).

The patients' mean length of stay in the ICU was 3.3 days (SD = 1.9; median = 3.0), ranging from two to 13 hospitalization days.

Table 2 presents the distribution of the means of items' answers for the *Escala de Avaliação de Estressores em Unidade de Terapia Intensiva*.

The item evaluated as the most stressful by patients was "being thirsty" (mean = 2.6; SD = 1.0), followed by "having tubes/probes in the nose and/or mouth" (mean = 2.3; SD = 1.2). The least stressful item evaluated was "the nursing staff member does not introduce himself/herself by the name" (mean = 0.9; SD = 0.8).

In Table 3, the distribution of the answers to each item according to the "Intensive Care Unit Environmental Stressor Scale" is presented.

Table 2 - Distribution of the percentages of the answers to each item of the *Escala de Avaliação de Estressores em Unidade de Terapia Intensiva,* according to the five-point Likert scale, Ribeirão Preto, São Paulo, Brazil, 2013-2014

Items of the scale (n = 105)	Mean (SD.)[a]	Rank
4. Being thirsty	2.6 (1.0)	1º
18. Having tubes/probes in the nose and/or mouth	2.3 (1.2)	2º
28. Not being able to sleep	2.3 (1.2)	2º
27. Having to look at details on the ceiling	2.2 (1.1)	3º
47. Being unable to play family roles	2.2 (1.2)	3º
1. Being stuck with tubes and drains	2.1 (1.1)	4º
14. Missing the husband, wife or companion	2.1 (1.1)	4º
29. Not being able to move hands or arms because of the intravenous serum or medication	2.0 (1.0)	5º
31. Having the lights on constantly	2.0 (1.0)	5º
37. Not having self-control	2.0 (1.1)	5º
32. Being in pain	1.9 (1.3)	6º
44. Not being able to communicate	1.9 (1.2)	6º
46. Being unaware of the length of stay in the ICU	1.9 (1.0)	6º
22. Seeing family and friends only for a few minutes a day	1.8 (1.0)	7º
45. Being afraid of dying	1.7 (1.3)	8º
6. Having an uncomfortable bed and/or pillows	1.6 (1.1)	9º
23. Not knowing when procedures will be performed	1.6 (1.0)	9º
34. Being stuck with needles	1.5 (0.9)	10º
38. Not knowing the current date	1.5 (1.2)	10º
40. Not having privacy	1.5 (0.9)	10º
48. Having financial worries	1.5 (1.1)	10º
11. Hearing the noise and alarms of the machines	1.4 (0.8)	11º
13. Having to use oxygen	1.4 (0.8)	11º
19. Not knowing what time it is	1.4 (1.1)	11º

To be continued

Table 2 (concluded)

Items of the scale (n = 105)	Mean (SD.)[a]	Rank
25. Listening to unfamiliar sounds and noises	1.4 (0.9)	11º
39. Being upset	1.4 (1.1)	11º
42. Being in a very hot or very cold room	1.4 (1.0)	11º
9. Being surrounded by strange machines	1.3 (0.7)	12º
17. Having the nursing staff constantly performing tasks around your bed	1.3 (0.7)	12º
24. Being woken by the nursing staff	1.3(0.8)	12º
35. Not knowing where you are	1.3 (1.1)	12º
36. Listening to the nursing staff saying terms that I do not understand	1.3 (0.9)	12º
3. Feeling that the nursing staff is in a rush	1.2 (0.8)	13º
5. Having to measure the blood pressure several times a day	1.2 (0.6)	13º
7. Hearing the telephone ringing	1.2 (0.6)	13º
16. Hearing the alarm of the cardiac monitor	1.2 (0.7)	13º
20. Hearing other patients' moan	1.2 (1.1)	13º
21. Being with men and women in the same room	1.2 (0.8)	13º
26. Observing other patients being treated	1.2 (0.9)	13º
33. Seeing serum bags hanging over your head	1.2 (0.8)	13º
43. Listening to people talking about you	1.2 (0.8)	13º
49. Being afraid of contracting AIDS	1.2 (0.9)	13º
8. Being frequently examined by the medical and nursing staff	1.1 (0.3)	14º
15. Not receiving explanations about your treatment	1.1 (0.9)	14º
30. Smelling strange odors around you	1.1 (0.8)	14º
41. Receiving care from doctors who I do not know	1.1 (0.4)	14º
50. Being pressured to agree with the treatment	1.1 (0.8)	14º
10. Feeling that the nursing staff is more aware of the machines than of you	1.0 (0.8)	15º
12. Nursing staff and doctors speaking too loud	1.0 (0.7)	15º
2. The nursing staff member does not introduce himself/herself by the name	0.9 (0.8)	16º

Note: a(SD) Standard deviation

Table 3 - Distribution of the percentages of the answers to each item of the *Escala de Avaliação de Estressores em Unidade de Terapia Intensiva*. according to the five-point Likert scale. Ribeirão Preto. São Paulo. Brazil. 2013-2014

Items of the scale	Not applied %	Not stressful %	Moderately stressful %	Very stressful %	Extremely stressful %
1. Being stuck with tubes and drains	1.0	40.0	21.9	22.9	14.3
2. The nursing staff member does not introduce himself/herself by the name	25.7	62.9	5.7	4.8	1.0
3. Feeling that the nursing staff is in a rush	11.4	69.5	12.4	3.8	2.9
4. Being thirsty	0.0	19.0	24.8	32.4	23.8
5. Having to measure the blood pressure several times a day	0.0	88.6	6.7	2.9	1.9
6. Having an uncomfortable bed and/or pillows	10.5	46.7	18.1	20.0	4.8
7. Hearing the telephone ringing	3.8	81.0	9.5	3.8	1.9
8. Being frequently examined by the medical and nursing staff	0.0	96.2	2.9	0.0	1.0
9. Being surrounded by strange machines	1.9	73.3	14.3	8.6	1.9
10. Feeling that the nursing staff is more aware of the machines than of you	21.9	64.8	7.6	3.8	1.9
11. Hearing the noise and alarms of the machines	4.8	60.0	24.8	8.6	1.9

To be continued

Tabela 3 (concluded)

Items of the scale	Not applied %	Not stressful %	Moderately stressful %	Very stressful %	Extremely stressful %
12. Nursing staff and doctors speaking too loud	16.2	70.5	8.6	3.8	1.0
13. Having to use oxygen	1.9	74.3	13.3	5.7	4.8
14. Missing the husband, wife or companion	5.7	30.5	25.7	26.7	11.4
15. Not receiving explanations about your treatment	25.7	54.3	9.5	7.6	2.9
16. Hearing the alarm of the cardiac monitor	8.6	68.6	15.2	6.7	1.0
17. Having the nursing staff constantly performing tasks around your bed	1.0	82.9	7.6	5.7	2.9
18. Having tubes/probes in the nose and/or mouth	0.0	38.1	13.3	25.7	22.9
19. Not knowing what time it is	21.0	41.0	17.1	15.2	5.7
20. Hearing other patients' moan	22.9	53.3	9.5	8.6	5.7
21. Being with men and women in the same room	5.7	79.0	5.7	6.7	2.9
22. Seeing family and friends only for a few minutes a day	5.7	46.7	18.1	23.8	5.7
23. Not knowing when procedures will be performed	3.8	58.1	16.2	17.1	4.8
24. Being woken by the nursing staff	4.8	74.3	12.4	5.7	2.9
25. Listening to unfamiliar sounds and noises	6.7	63.8	14.3	10.5	4.8
26. Observing other patients being treated	11.4	73.3	3.8	7.6	3.8
27. Having to look at details on the ceiling	0.0	38.1	19.0	28.6	14.3
28. Not being able to sleep	4.8	30.5	18.1	26.7	20.0
29. Not being able to move hands or arms because of the intravenous serum or medication	1.9	38.1	26.7	25.7	7.6
30. Smelling strange odors around you	17.1	61.0	13.3	6.7	1.9
31. Having the lights on constantly	1.0	41.9	27.6	18.1	11.4
32. Being in pain	17.1	27.6	17.1	21.9	16.2
33. Seeing serum bags hanging over your head	7.6	74.3	8.6	7.6	1.9
34. Being stuck with needles	4.8	61.0	14.3	16.2	3.8
35. Not knowing where you are	23.8	42.9	15.2	12.4	5.7
36. Listening to the nursing staff saying terms that I do not understand	8.6	68.6	10.5	9.5	2.9
37. Not having self-control	1.9	42.9	21.0	22.9	11.4
38. Not knowing the current date	18.1	43.8	17.1	13.3	7.6
39. Being upset	15.2	53.3	11.4	12.4	7.6
40. Not having privacy	0.0	71.4	13.3	9.5	5.7
41. Receiving care from doctors who I do not know	1.0	90.5	5.7	2.9	0.0
42. Being in a very hot or very cold room	14.3	54.3	12.4	15.2	3.8
43. Listening to people talking about you	11.4	73.3	6.7	4.8	3.8
44. Not being able to communicate	7.6	38.1	20.0	21.9	12.4
45. Being afraid of dying	10.5	51.4	9.5	10.5	18.1
46. Being unaware of the length of stay in the ICU	0.0	48.6	21.9	20.0	9.5
47. Being unable to play family roles	2.9	39.0	12.4	28.6	17.1
48. Having financial worries	6.7	62.9	9.5	12.4	8.6
49. Being afraid of contracting AIDS	11.4	71.4	4.8	8.6	3.8
50. Being pressured to agree with the treatment	16.2	71.4	4.8	4.8	2.9

If the options of answers are grouped in only two categories, "not applied/not stressful" or "some degree of stress (moderately, very or extremely)", in only 13 of the 50 items, more than 50% of patients classified them as "some degree of stress" (items 1, 4, 14, 18, 27, 28, 29, 31, 32, 37, 44, 46 and 47).

Regarding the total score of the *Escala de Avaliação de Estressores em Unidade de Terapia Intensiva*, patients presented a mean of 75.7 (SD = 22.5; median = 71.0), and the interval obtained was from 30 to 129.

Table 4 presents the means of the stressors, according to the sociodemographic and clinical characteristics.

Patients who presented pain in the IPP evaluated the hospitalization period in the ICU as the most stressful item, and this difference was statistically significant (p = 0.02). For the other variables, there were no statistically significant differences among the groups.

Table 4 - Distribution of means and standard deviation of the stressors, according to gender, age, type of surgery, surgical time, presence of pain in the immediate postoperative, intubation time in the immediate postoperative, use of psychotropic medications in the immediate postoperative and length of stay in the unit, Ribeirão Preto, São Paulo, Brazil, 2013 - 2014

Variable	Mean (SD)[a]	*p** value
Gender		
Female (n = 38)	81.0 (23.7)	0.07
Male (n = 67)	72.7 (21.3)	
Age		
Adult (n = 50)	76.7 (23.9)	0.66
Aged (n = 55)	74.7 (21.2)	
Type of surgery		
CABGb (n = 54)	76.6 (19.8)	0.68
Mitral valve surgery with or without CABG (n = 51)	74.7 (25.2)	
Surgical time		
More than 270 minutes (n = 51)	76.8 (20.5)	0.62
Up to 270 minutes (n = 54)	74.6 (24.4)	
Presence of pain in the IPP		
Yes (n = 86)	77.9 (22.5)	0.02
No (n = 19)	65.4 (19.6)	
Intubation time in the IPP		
More than 12 hours (n = 51)	77.5 (24.08)	0.43
Up to 12 hours (n = 54)	74.0 (20.2)	
Use of psychotropic medications in the IPP		
No (n = 20)	76.9 (23.0)	0.80
Yes (n = 85)	75.4 (22.5)	
Length of stay in the ICU		
More than three days (n = 28)	77.6 (25.9)	0.63
Up to three days (n = 77)	75.0 (21.2)	

*Notes: a(SD) = Standard deviation; bCABG = Coronary artery bypass graft surgery; *P value resulting from the Student's T-test*

DISCUSSION

When investigating the main stressors perceived by patients in the IPP of CABG surgery and/or mitral valve surgeries, it was verified that the most stressful items evaluated were "being thirsty", "having tubes/probes in the nose and/or mouth" and "not being able to sleep". The results corroborate other studies available in the literature. "Having tubes/probes in the nose and/or mouth" was considered the most stressful item, both for elderly patients and adult patients submitted to elective CABG and/or mitral valve surgeries[10]. "Not being able to sleep" was the second most stressful item in the perception of older people, whereas "being thirsty" was the second most stressful item for the adults[10]. "Having tubes/probes in the nose and/or mouth" was also considered one of the most stressful items by patients submitted to CABG[8].

In one another study, also conducted with patients submitted to elective CABG and/or mitral valve surgeries, the researchers found that "not being able to sleep", "having tubes/probes in the nose and/or mouth" and "being thirsty" were considered the most stressful items by the patients, besides the item "being in pain"[9]. The aforementioned study was conducted at the same hospital as the present study was conducted, during May of 2007 and November of 2008, and even after five years, patients still experience these stressors[9].

Thirst sensation in the IPP of cardiac surgeries might be explained by the dehydration inherent to the surgical procedure. It occurs because of several factors, but especially by the significant and insensitive loss of fluid due to the prolonged thoracotomy, estimated between 6ml/kg/h and 8ml/kg/h. In addition, extracorporeal circulation induces the diffuse capillary leak by the activation of cynines and complementary systems, resulting in significant interstitial edema, reduced intravascular volume and increased body volume. Blood loss during surgical procedure should also be considered. This volume deficit is sometimes difficult to be replaced or corrected in the surgical center, due to the increase of the peripheral vascular resistance, most times induced by hypothermia. The decrease of the left ventricular compliance due to

myocardial edema, resulting from cardiac injury or the inappropriate myocardial protection against ischemia should also be considered. Therefore, hydration, partially started in the surgical center, is continued in the ICU[14].

Regarding the stressor "having tubes/probes in the nose and/or mouth", it is already expected that the patient remains intubated during the first hours in the IPP of cardiac surgery[15]. At the end of the surgical procedure, patients are transferred under mechanical ventilation to the ICU, and spontaneous ventilation is reassumed as far as anesthesia is reversed by the body[16]. The extubation of the patient in the surgical center is possible, however, the occurrence of hypothermia, bleeding and hemodynamic instability oppose its beneficial potential[17]. Once more, the surgical procedure itself and the use of extracorporeal circulation favor the deterioration of the intra- and postoperative pulmonary function by means of systemic inflammatory reactions that might cause complications such as atelectasis and pulmonary infections[16,18]. In the present study, all patients remained intubated in the IPP, and the intubation mean time in postoperative was 16.7 hours (SD = 22.8; median = 12.0), ranging from two to 187 hours. Considering that endotracheal extubation is recommended within the first hours of postoperative, preferably before the sixth hour after arriving in the ICU[15], it was observed that patients remained intubated for a prolonged time under mechanical ventilation. Such factor might have contributed to the evaluation of this item as the second most stressful by patients.

However, regarding the third stressor with higher score in this article "not being able to sleep", there is current evidence in the literature that the environment of intensive care is considered a disturbing stressor for the patients' sleep pattern due to monitoring, care interventions during the 24 hours of the day, noises and uninterrupted exposure to light[19]. In the present study, 19 patients (18.1%) classified this stressor as moderately stressful, 28 (26.7%) as very stressful and 21 (20.0%) as extremely stressful. The results corroborate the literature[9-10]. Patients submitted to their first cardiac surgery (CABG and/or mitral valve surgeries) in a university hospital in a city in the state of São Paulo evaluated "not being able to sleep" as the second most stressful item during their stay in the ICU[9]. Another study that was also conducted with patients in the IPP of cardiac surgeries in the Brazilian Federal District showed that elderly patients evaluated "not being able to sleep" as the second most stressful item during their stay in the ICU, whereas younger patients evaluated this item as the second most stressful[10].

In a study conducted in Brazil[20], researchers investigated the influence of care interventions performed by the healthcare staff on the sleep continuity of 20 patients hospitalized in the ICU, filming and using the "ActiSleep" device, which enables the measurement of sleep interruptions by means of detecting the patient's awakening.$_{<0}$ A total of 529 care interventions were found during the data collection, with a mean of 44.1 care interventions per patient in each 24 hours. However, when analyzing the 288 hours of filming, care interventions were not observed only in 63 hours (21.8%). The intervals without intervention concentrated during the night. In addition, all patients presented intervals of one hour without care interventions and only five (41.7%) patients presented intervals of 120 consecutive minutes, which enabled them a full sleep cycle. Another significant finding of this study was that care interventions were performed according to hours prescribed in the medical prescription.

Sleep deprivation may cause physiological alterations in patients, such as abnormalities in the immune system, thermoregulatory system, alterations in metabolism, excessive activation of sympathetic nervous system, besides psychological disorders[21]. In addition, there is evidence in the literature that sleep deprivation is a potential risk factor for the outbreak of delirium in patients hospitalized in the ICU[22]. Hence the importance of early diagnosis and intervention, since delirium is associated with worse outcomes for critically ill patients, including the increase of mechanical ventilation time, ICU stay and mortality[22].

Items evaluated as less stressful by patients were the nursing staff member does not introduce himself/herself by the name", followed by "feeling that the nursing staff is more aware of the machines than you" and "nursing staff and doctors speaking too loud". These results differ from the ones found in the literature. The items "hearing the telephone ringing", "having to use oxygen" and "seeing family and friends only for a few minutes a day" were considered less stressful by elderly patients submitted to elective CABG and/or mitral valve surgeries[10]. However, adults investigated in this same study evaluated "having the nursing staff constantly performing tasks around your bed", "being frequently examined by the medical and nursing staff" and "hearing the telephone ringing" as the least stressful items.

The items "having the nursing staff constantly performing tasks around your bed" and "being frequently examined by the medical and nursing staff" were also the least stressful items for patients evaluated in two other national studies[8-9].

When the options of answers of the stressors scale were grouped into two categories, "not applied/ not stressful" or "some degree of stress (moderately, very or extremely)", in only 13 of the 50 items, more than 50% of the patients classified them as "some degree of stress", being them "being stuck with tubes and drains", "being thirsty", "missing the husband, wife or companion", "having tubes/probes in the nose and/or mouth", "having to look at details on the ceiling", "not being able to sleep", "not being able to move hands or arms because of the intravenous serum or medication", "having the lights on constantly", "being in pain", "not having self-control", "not being able to communicate", "being unaware of the length of stay in the ICU" and "being unable to play family roles".

In the present study, the item "being in pain" was the sixth stressor in the scale's overall rank, considered moderately stressful by 18 (17.1%) patients, very stressful by 23 (21.9%) patients and extremely stressful by 17 (16.2%) patients. Furthermore, pain complaint in the IPP was found in records of 86 patients (81.9%). This item was evaluated as the most stressful[8-9] or one of the most stressful[10] in other studies conducted with patients submitted to cardiac surgery. It is worth mentioning that in the present study, patients who presented

pain in the IPP presented higher scores of stressors than patients who did not, being the difference statistically significant.

The mean total score of the *Escala de Avaliação de Estressores em Unidade de Terapia Intensiva* was 75.7 (SD = 22.5). Considering that the scale takes on values from 0 to 200, where higher values indicate higher stress perceived by patients, it can be generally inferred that the IPP was evaluated by patients as "not stressful" to "moderately stressful". The comparison of this result with studies found in the literature becomes impaired, since the available studies used the translated version of the aforementioned scale[8-10], instead of the version adapted to the Portuguese language[4]. In the translated version[23], the scale has 42 items, with four-point Likert options, where (1) means not stressful; (2) slight stressful; (3) stressful and (4) very stressful. Therefore, the score might range from 42 to 168 points.

Finally, there was no statistically significant association of the stressors with gender, age, type of surgery, surgical time, intubation time in the IPP, use of psychotropic medications in the IPP and length of stay in the unit. The results corroborate a study[9] in which there were not statistically significant differences in the stressors' scores, considering gender, age and length of stay in the ICU of patients in the IPP of CABG and/or mitral valve surgeries. Similar results were found in another study[10], in which the researchers did not find significant correlations of age and gender with the stressors' total score perceived by patients. In this same study, the use of psychotropic medications in the IPP, type of surgery and length of stay in the ICU did not present association with the stressors' total score in the group of adult patients. Nonetheless, the use of psychotropic medications in the IPP presented a statistically significant association in the group of elderly patients, that is, elderly patients who received these medications in the IPP presented a higher level of stress[10].

CONCLUSION

Items perceived as the most stressful by patients in the IPP of cardiac surgery were "being thirsty", "having tubes/probes in the nose and/or mouth" and "not being able to sleep". Among the sociodemographic and clinical characteristics analyzed in the study, only pain in the IPP presented a statistically significant difference in the patients' perception of stressors. These results can support the development of healthcare protocols, with the aim of reducing the patients' exposure to the main stressors experienced in the IPP of cardiac surgeries, taking into account that several factors considered stressful by patients can be controlled by the healthcare staff. For example, the pain referred to by patients can be controlled with the implementation of a protocol of evaluation and treatment, based on clinical practice, with evaluation of the objective and systemic pain, associated with the administration of analgesics.

Knowledge on items evaluated as the most stressful by patients in the IPP of cardiac surgery may help the implementation of practices associated with the reduction of these stressors, including the development of healthcare training on ICU environment and common procedures to patients submitted to this surgical procedure and undertaking of practices that make the beginning of sleep easy and that reduce the number of interruptions.

The undertaking of longitudinal studies investigating the effectiveness of the implementation of healthcare protocols, focused on the patients' preparation to the anesthetic and surgical procedures, as well as their stay in the ICU is important, with the major aim to reduce the patients' exposure to stressors.

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