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Nursing workload in a postanesthesia recovery room: a mixed-methods study

Carga de trabalho de enfermagem em sala de recuperação pós-anestésica: um estudo misto

Carga de trabajo de enfermería en una sala de recuperación postanestésica: un estudio mixto

Ana Lúcia Uberti Pinheiro[I], Quézia Boeira da Cunha[II], Daiane Dal Pai[III]
Rosângela Marion da Silva[IV], Suzinara Beatriz Soares de Lima[V], Silviamar Camponogara[VI]

Abstract: Objective: analyzing the workload of nurses in a postanesthesia recovery room in a teaching hospital in the south of Brazil. **Method:** mixed-methods sequential explanatory design. In the quantitative, cross-sectional stage, the workload was evaluated using the Nursing Activities Score in 209 patients. In the qualitative stage, 14 nurses were interviewed. Quantitative data analysis was carried out using SPSS Statistics 21.0. Qualitative data went through Bardin's content analysis. **Results:** the workload found was 57%. Two categories emerged: Characteristics of patients and situations that are determinant for workload — clinical conditions of the patients were said to intensify the workload; and Work organization: characteristics that influence workload — personnel sizing and team cooperation are determining factors. **Conclusion:** the overload is high, and the workers notice the features that influence it.
Descriptors: Workload; Nursing; Postanesthesia Nursing; Personnel Downsizing

Resumo: Objetivo: analisar a carga de trabalho de enfermagem em Sala de Recuperação Pós-Anestésica de um Hospital Universitário do Sul do Brasil. **Método:** abordagem metodológica mista, explanatório sequencial. Na etapa quantitativa, transversal, foi avaliada a carga de trabalho pelo *Nursing Activities Score*, em 209 pacientes. Na etapa qualitativa, foram realizadas entrevistas com 14 participantes. A análise dos dados quantitativos foi realizada no SPSS *Statistics* 21.0. Os dados qualitativos passaram por análise de conteúdo de Bardin. **Resultados:** a carga de trabalho verificada foi de 57%. Duas categorias surgiram: Características dos pacientes e situações determinantes para a carga de trabalho - as condições clínicas dos pacientes são apontadas como intensificadoras da carga de trabalho; e Organização do trabalho: características que influenciam na carga de trabalho – dimensionamento de

[I] Nurse. MS in Nursing. Universidade Federal de Santa Maria. Santa Maria, Rio Grande do Sul, Brazil. E-mail: aninhaupinheiro@yahoo.com.br. ORCID: 0000-0003-4658-1069

[II] Nurse. MS in Nursing. Universidade Federal de Santa Maria. Santa Maria, Rio Grande do Sul, Brazil. E-mail: quezinhacunha@hotmail.com. ORCID: 0000-0001-7014-9343

[III] Nurse. PhD in Nursing. Universidade Federal do Rio Grande do Sul. Porto Alegre, Rio Grande do Sul, Brazil. E-mail: daiadalpai@yahoo.com.br. ORCID: 0000-0002-6761-0415

[IV] Nurse. PhD in Nursing. Universidade Federal de Santa Maria. Santa Maria, Rio Grande do Sul, Brazil. E-mail: cucasma@terra.com.br. ORCID: 0000-0003-3978-9654

[V] Nurse. PhD in Nursing. Universidade Federal de Santa Maria. Santa Maria, Rio Grande do Sul, Brazil. E-mail: suzibslima@yahoo.com.br. ORCID: 0000-0002-2162-8601

[VI] Nurse. PhD in Nursing. Universidade Federal de Santa Maria. Santa Maria, Rio Grande do Sul, Brazil. E-mail: silviaufsm@yahoo.com.br. ORCID: 0000-0001-9342-3683

pessoal e cooperação entre a equipe são fatores determinantes. **Conclusão:** a carga de trabalho é alta e os trabalhadores percebem características que a influenciam.
Descritores: Carga de trabalho; Enfermagem; Enfermagem em Pós-Anestésico; Downsizing organizacional

Resumen: **Objetivo**: analizar la carga de trabajo de enfermería en la sala de recuperación post-anestésica de un hospital universitario en el sur de Brasil. **Método**: enfoque metodológico mixto, explicativo secuencial. En el paso cuantitativo, transversal, la carga de trabajo fue evaluada por el Nursing Activities Score, en 209 pacientes. En la etapa cualitativa, se realizaron entrevistas con 14 trabajadores de enfermería. El análisis de los datos cuantitativos se realizó en SPSS Statistics 21.0. Los datos cualitativos se sometieron al análisis de contenido de Bardin. **Resultados**: la carga de trabajo verificada fue del 57%. Surgieron dos categorías: características de los pacientes y situaciones determinantes para la carga de trabajo: las condiciones clínicas de los pacientes se identifican como intensificadoras de la carga de trabajo; y Organización del trabajo: características que influyen en la carga de trabajo: el tamaño del personal y la cooperación entre el equipo son factores determinantes. **Conclusión**: la carga de trabajo es alta y los trabajadores perciben características que la influyen.
Palabras clave: Carga de trabajo; Enfermería; Enfermería Posanestésica; Redúccion de Personal

Introduction

Brazilian nursing workers feel exhausted. This is one of the results of a research carried out by the *Fundação Oswaldo Cruz* (FIOCRUZ), from an initiative by the Federal Nursing Council (COFEN), which found that 66% of interviewees felt work exhaustion. The study traced the profile of the profession and is considered the broadest survey yet on a professional category in Latin America[1].

This reality was also found in other countries. A study carried out in 12 European countries showed that two in every three nurses present intense symptoms of exhaustion, even among those with few years of experience. The nurses reported that many important actions of nursing care were not being carried out due to lack of time, although one third of them worked beyond their shifts.[2]

Workload is the time spent by the nursing team to carry out direct or indirect patient-assistance activities. The workload is influenced by many factors, such as the degree of healthcare dependency of the patient, the complexity of the disease, the management of the institution, the profile of the nursing team, the physical aspects, and routines established in the unit, in addition to available technological resources.[3]

Nurses have been seeking instruments that can be used to objectively measure workload in their field of work. The Nursing Activities Score (NAS), an instrument translated, adapted and trans-culturally validated to Portuguese,[4] has been the most reliable measurement scale to assess the workload in intensive care. The NAS has been used in many countries and institutions, and the number of publications that use the scale to this end is growing.

The Postanesthesia Recovery Room (PARR) is the hospital unit responsible for attending patients after surgical-anesthetic procedures. These units have specific organizational features, since the anesthesia recovery period is critical for patients, who need constant care and surveillance. Additionally, the presence of patients who need semi-intensive and intensive care is common. These patients demand numerous activities, including ventilatory and hemodynamic invasive support.[5]

Based on the above, it becomes clear that analyzing the nursing workload is paramount to define what is the adequate size of the personnel, in addition to being an important strategy for the evaluation of the quality of care and for the promotion of the health of the workers. Additionally, the studies carried out on the theme mostly used quantitative approaches, and do not consider the perspective of the subjects involved in this problem, that is, nursing workers. Considering these factors, this researched aimed to deepen the knowledge on the object studied, considering that the results of the quantitative approach may be better interpreted using a second qualitative data source, which led to the following research question: What is the nursing workload in the Postanesthesia Recovery Room (PARR) of a University Hospital, according to the NAS and to the perception of nursing workers? Therefore, the objective of this research was analyzing the workload of nursing professionals in a postanesthesia recovery room in a university hospital (UH) in the south of Brazil.

Method

This study uses the mixed-methods sequential explanatory design. According to this model, data were collected in sequential stages, starting with quantitative data and then moving to qualitative data. Data were connected through an analysis of the first stage, which was used as a bases for the development of the second one, enabling a deeper understanding and interpretation of results.[6]

The investigation was carried out in the Postanesthesia Recovery Room (PARR) of a UH in the South of Brazil. The PARR has 10 beds and attends patients from many surgical specialties. Its work force has at least one exclusive nurse in each work shift and from three to four nursing technicians per shift. The morning and afternoon shifts last for 6 hours while the night shift lasts for 12.

In the quantitative stage of the research, the participants were 209 patients hospitalized in the PARR, in June and July 2016, meaning this is a convenience sample. These participants were selected to be evaluated through the application of the NAS for as long as they remained in the unit. Inclusion criteria in the research were: patients of any sex and age, admitted in the PARR after surgical-anesthetic procedures from any medical specialty, who had been submitted to any anesthetic technique and remained in the unit for at least one hour.

Quantitative data were collected retrospectively, through daily consultations of the electronic and physical records of the patients. Data from a total of 30 days were collected. The NAS gives a score to the length of time spent in the performance of the 23 procedures listed in the instrument, which are worth from 1.2 to 32.0 points. The score attributed is the result of adding up the individual points that correspond to the needs of direct and indirect assistance of each patient. It can vary from 0 to 176.8% and indicates the percentage of time spent by the nurse in nursing assistance. Therefore, a score of 100 indicates that the patient required, in the last 24 hours, 100% of the available time of a nursing worker for their care.[4]

Quantitative data were organized after double independent input into an electronic Microsoft® Excel spreadsheet that was the database of the study. After a double-checking for mistakes and inconsistencies, data analysis was carried out using the software SPSS Statistics for Windows, version 21.0.

The Shapiro-Wilk test was used to check the normality of the distribution of continuous variables. The distribution of data was non-normal, and therefore, non-parametric tests were used, such as the Chi-square. Pearson's correlation was used and, to compare the groups, Mann-Whitney's U test and Kruskal-Wallis's were used. The results were considered statistically significant when $p < 0.05$, that is, with a confidence interval of 95%.

The 14 nursing workers from this unit were also participants in this research. They were invited to participate in the study so the qualitative data could be obtained. Their number was proportional to the number of nurses and nursing technicians. Inclusion criteria adopted were: nursing workers who spent at least 50% of their monthly workload in the PARR and had worked in the unit for at least six months. Exclusion criteria included: workers who were on leave or suspended for any reason during data collection, and those who had any direct link to the research group that promoted the investigation. Participants were selected randomly, and data collection only started after the Free and Informed Consent Form was read, accepted, and signed. The final number of interviews was in accordance to the principle of data saturation.

Considering the methodological resources used, after an analysis of quantitative data, a semi-structured interview script was outlined to investigate further the results from the first stage of the study, thus connecting data from both. This script was used to produce the qualitative data. The interviews were carried out in the first semester of 2017. Answers were recorded in an MP3 digital micro-recorder and later transcribed by the researcher himself. They lasted for a mean of 20 minutes.

Qualitative data were submitted to Bardin's content analysis. This analysis technique is made up of the following stages: 1) gathering of the *corpus* for the analysis (transcribed interviews and notes about them); 2) pre-analysis: skimming the data collected to operationalize and systematize initial thoughts; 3) data categorization: after an in-depth reading of the material being analyzed, seeking the establishment of categories and/or subcategories; 4) interpretive analysis: when categories are discussed based on the works from the authors from the literature review, which are used in tandem with the researchers' data interpretation.[7] To organize the data, interviews were transcribed using the letter "N" for nurse and "T" for nurse technician, followed by sequential numbers according to the order of the research. This was the *corpus* of the research.

This research is in accordance to the prescriptions of the National Council of Health Resolution n. 466, from December 12, 2012. This resolution is about researches with human beings and aims to guarantee the rights and duties of research participants, of the scientific community, and of the state. This project was approved by the Research Ethics Committee under CAAE 54605816.7.0000.5346 and protocol 1.513.582, in April 2016.

Results

Among the 209 patients in the sample,56% were male, approximately 55% came from Santa Maria and 38% came from the Clinical Surgery Unit of the institution. Regarding the character of the procedures, there was a high number of urgent surgeries, 51% of the total. In 98% of the hospitalizations, the outcome was the discharge from the postanesthesia recovery unit, and 52% of patients were classified as ASA II. The most commonly applied type of anesthesia was general anesthesia, in 74% of patients. The most prevalent surgical specialty was trauma orthopedics, with 24%, followed by general surgery, in 17% of cases.

The mean age of patients was 50.8 years old. The median of the duration of the anesthetic-surgical procedure was 100 minutes, and the median of permanence in the PARR was 09h 35min. Regarding workload, the mean score of the NAS during patient permanence was 57.31%, suggesting that each patient demands a mean of 57% of the working time of a nursing worker.

In the application off the NAS, the results indicate a higher percentage of control and monitoring activities, laboratory investigations, medications, support and care to relatives and patients, as well as managerial and administrative tasks, respiratory support, renal support, and specific interventions, all of which are presented in table 1.

Table 1 - descriptive statistics of nursing interventions carried out in the Postanesthesia Recovery Room, according to the Nursing Activity Score. Brazil - RS, 2016.

Nursing Activities Score	**Categories**	**N**	**%**
Basic activities			
1. Monitoring and control	1.a	8	3.83%
	1.b	190	90.90%
	1.c	11	5.27%
2. Laboratory investigations	Yes	132	63 lç,16%
3. Medication	Yes	195	93.30%
4. Hygiene procedures			
	4.a	30	14.35%
	4.b	8	3.83%
	4.c	4	1.92%
	No	167	79.90%
5. Drainage care	Yes	84	40.19%
6. Mobilization and positioning			
	6.a	40	19.14%
	6.b	17	8.13%
	6.c	1	0.48%
	No	151	72.25%
7. Support and care to relatives and patients			
	7.a	206	98.56%
	7.b	3	1.44%
8. Administrative and managerial tasks			
	8.a	1	0.48%
	8.b	207	99.04%
	8.c	1	0.48%

Ventilatory support			
9. Respiratory support	Yes	142	67.94%
10. Artificial airway healthcare	Yes	19	9.09%
11. Pulmonary function improvement treatments	Yes	25	11.96%
Cardiovascular support			
12. Vasoactive medication	Yes	22	10.53%
13. Intravenous replacement of large fluid losses	Yes	9	4.31%
Renal support			
17. Quantitative assessment of urine output	Yes	126	60.29%
Metabolic support			
19. Treatment of complex metabolic acidosis/alkalosis	Yes	2	0.96%
20. Intravenous overfeeding	Yes	3	1.44%
Specific interventions			
23. Interventions outside the PARR	Yes	209	100%

Source: created by the authors.
Note: items 14, 15, 16, 18, 21, and 22 did not score.

Using Pearson's correlation, age and NAS were found to have a weak correlation (r=0.28455, p=<.0001): as age increases, workload increases. Similarly, the length of the procedure and the workload had a weak correlation (r=0.22703, p=0.0009): as the length of the anesthetic-surgical procedure increases, the workload also does. The length of stay variable did not show correlations to any other variables (age, length of procedure, or NAS).

When the two groups of patients are compared — those who underwent elective surgeries (N=103) and those who underwent urgent ones (N=106) —, and when one considers their respective NAS means (57.19% and 57.43%), the difference between the groups was not statistically significant (p=5821). Similarly, there were no significantly statistical differences when workload was related to the type of anesthesia (p=0.6964).

On the other hand, the relation between ASA variables and workload was statistically significant (p=0.0006). The higher the level in the ASA classification, the higher the workload is.

With regards to qualitative data, from the 14 workers who responded to the interviews, 3 were male and 11 were female. The group was mostly made up of women, with 4 participants

who were single, 10 who were married, and ages varying from 28 to 47 years old. Among the participants, four are nurses and 10 are nursing technicians. The length of work in the institution varied from 8 months to 16 years.

After interview data was analyzed, their perspective on their overload could be exposed, and the following categories emerged: Characteristics of patients and situations that are determinant for workload; and Work organization: characteristics that influence workload.

Characteristics of patients and situations that are determinant for workload

When asked about the profile of the patients received at PARR, nursing workers defined these clients as patients in severe conditions, with associated comorbidities or in an advanced state of their base disease, requiring more care from the health team.

> [...] *a high demand of patients being admitted, transferred, and our RR here is unique, because we often act as an ICU* [intensive care unit]*. So, not long ago, from 10 patients, 7 were using mechanical ventilation. That is why the workload is bigger and there's a lot of stress, because they arrive in the unit, we have to receive them, check all the drains, all dressings, comorbidities, bleedings from the first post-op (PO), post-surgery* [...]*, there's pain and pain management* [...](N1)

Considering the profile of the patients attended in this setting, the workers were asked about the main characteristics of these patients, those that demand the most care from the nursing team, that is, those that increase workload. Most interviewees mentioned the instability of the patient as the main factor that increased workload, as can be noted below:

> *If they're unstable, we spend our day around them. So, generally that's it, big surgeries, we have a lot of them, we have to be there all the time, because there are lots of things, drainage, this and that. And since most patients are serious cases, they demand a lot more. Sometimes, with patients with stable mechanical ventilation, we just do what we need to do: alternate positions, bathe, medicate* [...]*, but some of them are not in mechanical ventilation, but are unstable* [...]*(*T5)

Still regarding the complexity of the setting and of urgency/emergency situations, the participants state that some of them may generate work overload of the nursing professional, as the following statement shows:

> *Some nights I literally can't have breaks. There are so many things to do, a lot of wounds to dress, post-op instability in patients. It's that patient that, like, in the emergency service, we receive and don't know who he is, where he came from, but there he is, shot in the head and we're caring for him.* (T8)

Therefore, the particular features of each patient in the immediate post-op, which is considered a critical period, associated to a group of clients that often presents precarious health conditions to begin with, with comorbidities that can lead to potential complications, contribute for the nursing team from the PARR studied to perceive their workload as high.

Work organization: characteristics that influence nursing workload

Considering the sizing of personnel as a determining factor for nursing workload, when asked about their work routine and the separation of patients between team members, the low number of workers was mentioned:

> *But, I mean, we are around three or four workers* [...]. *The ideal number is four. But, we stay, sometimes, in three, in the weekends, in three, then there's three patients for each, one of us gets a fourth one, but then we divide them, whoever gets four gets those that theoretically are easier. If there are people enough we divide the breathers, one stays at the ventilators, the others divide other patients, but this depends on how many workers we have.* (T4)

Considering the organization characteristics of the work, the interviewees mentioned the lack of beds to receive post-surgery patients as a determining factor to increase the workload in the sector. The length of permanence of patients is variable, and some of them remain hospitalized longer than required to recover from the anesthetic procedures, due to organizational issues. As a result, the nursing workload is increased:

> [...]*these are beds we almost need to ask for the love of God, receive our patients, because the RR will not discharge its patients to the third, fourth or fifth floors, the ward is closed, but we need turnover. The physician needs to give permission in the third* [third floor — surgical clinic] *so the PARR patients, especially, can be received, so the unit can discharge the surgery and they can leave.*(N4).

> *So, these are basically hospitalized patients, they receive baths, in the other recovery rooms they wouldn't* [...] *if this worked as one.*(T8)

When asked about factors that could diminish their workload, many workers mentioned the nursing team as being cooperative, generating a good feeling among the members and softening the adversities of the working process.

> *The team is good, it's great, actually, I think this is the word we must use. It's what I told you: everyone helps everyone, the work environment is good, we are a very good team, the patient is not mine, or yours, he's everyone's.*(T6).

It can be understood that the high demand of activities, associated to other organizational/institutional factors, contribute for the perception of a high workload in the sector. Personnel sizing is paramount for the workload to be adequate for all nursing team members. Even a cooperative group feels exhausted in many moments of their daily work.

Discussion

In the quantitative sample of this study, which included 209 patients, the mean age was 50.8 years of age, 56% were male, 52% were classified as ASA II, the most common type of anesthesia was general anesthesia (74%), and the most prevalent type of surgery was traumatology-orthopedics (24%), followed by general surgery (17%). The median of the length of stay of the patients was 9 hours and 35 minutes, and 98% of them were sent to hospitalization units.

Regarding the qualitative stage, nursing workers were mostly female, corroborating results from a recent research carried out to identify the profile of nurses in Brazil, which found that the health field has historically been female, especially due to nursing. The number of men in the profession has been growing, but Brazilian nursing teams are still 85.1% made up of nurses.[8]

In a similar study, carried out in postanesthesia recovery, the authors found that the mean age of patients was 51.57 years of age, 54% were female, and 58.2% were classified as ASA II. General anesthesia was the most common, carried out in 76.1% of cases. For the surgical specialties, the highest prevalence was in general surgery, with 24.6%. The median of the length of permanence in the unit was 4.83 (0.33-53.22) hours. 81.3% of patients were discharged into hospitalization.[5] These studies, carried out in a setting of recovery from anesthesia, can be seen to be partially convergent.

However, in this investigation, the length of permanence of the patients was high, despite not having a statistically significant relation to workload. That was not the case in another investigation, carried out in an intensive care unit (ICU), which evaluated the factors associated to the workload in an ICU and showed that the length of stay in the ICU was a significant factor for high nursing workload in the first day of hospitalization.[9] These findings reiterate that patients who spend less hours in the unit tend to depend more on nursing care, due to the assistance and therapies they need.[5] On the other hand, locally, patients often remain in the postanesthesia room due to the lack of available beds. A study on intensive surgical therapy in a university hospital stated that improvements in the reorganization of nursing care diminishes nursing workloads and can have positive effects in the health conditions of patients, even in their time of permanence in the ICU.[10]

The ASA classification level and the most prevalent anesthetic technique are in accordance with a study carried out in post-anesthetic recovery, that indicated similar

percentages with regards to these variables. The same study shows a length of stay in the recovery room of 4.83 (3.43 - 6.72) hours, considerably lower than the one found in this investigation.[11] The qualitative results of this investigation allow to understand this issue from a broader perspective, considering that the workers mentioned how difficult it is to find beds for the hospitalization of patients after surgery, which increases the length of permanence in the PARR, which, in turn, also contributes for a higher perception of the work overload.

A significant percentage of patients were classified as ASA II, that is, medium anesthetic risk. A retrospective study that evaluated the incidence of anesthetic-surgical deaths in the first 24 hours, in a UH, concluded that there were more deaths among patients classified as ASA III or higher.[12] In this study, there was a positive correlation with the workload: the higher the ASA, the higher the NAS. This finding too is in accordance to data obtained from the interviews, in which the workers mentioned that the presence of comorbidities in patients is one of the factors that increased the demand for nursing care.

Regarding NAS values, a study carried out in a postanesthesia recovery unit found a mean NAS of 76.2 (70.47 - 84.6) points (%).[11] Although the mean NAS in this study was lower, 57.31%, it represents 13.7 hours of nursing care every 24 hours, on average. Considering current legislation, [13] this number of hours corresponds to patients who are highly dependent, in a semi-critical state. In these cases, the recommendation states that there should be one professional for every 2.4 patients. According to the statements of the workers, each nursing technician is responsible for three or four patients in their work shift. Therefore, when the unit is full, there may be work overload, meaning that, in these cases, the team would be undersized.

As a result, according to the profile of the patients cared for, which can be seen in the statements of the participants of the study, it becomes clear that the presence of comorbidities often implies in post-op instability and, consequently, in an increased workload, since these patients need close monitoring of vital-signs, and hemodynamic and respiratory parameters, to

avoid complications related to the anesthetic-surgical procedure. The NAS data are in consonance to the testimonials, since the items that marked the most points are related to the monitoring and control of the patients, as well as to their respiratory support and their urine output.

A study carried out in South Korea showed a direct relation between the inadequate sizing of nursing personnel and increases in adverse events. It suggests that there is a direct relation between the number of patients per nurse and the chances of failure with regards to patient safety, bad quality of care, and care activities not carried out due to lack of time.[14]

The sizing of personnel is an important resource to improve nursing services. An adequate number of workers to offer health services implies identifying the current workload, related to the number of patients, their degree of dependency, and the mean time spent on their assistance.[15]

According to a study carried out in a coronary unit, high NAS values show that patients in specialized units demand high workloads from nursing teams, due to their requirements for specific care and monitoring that occupy more than half the time a professional in direct care has available.[16]

The descriptive analysis of the most expressive data, obtained using NAS in this study, shows that in the first item of the instrument, control and monitoring, 91% of patients scored in sub-item b, that is, they required a nurse to be at their bedside on continuous observation or activity for two hours or more during duty for reasons related to safety, pregnancy, or therapy, such as: non-invasive mechanical ventilation, weaning, agitation, mental confusion, prone position, organ donation procedures, preparation and administration of fluids or medication, and support for specific procedures. This context shows the complexity of patients received in the institution being studied and can also be identified in the statements of the workers. Their statements indicate that the instability of post-op patients is the main factor that increases the

workload in the PARR. Additionally, the results of a study carried out in a postanesthesia recovery unit converge with this one, since 76% of patients scored in the aforementioned sub-item of the instrument.[17]

The patients from a postanesthesia recovery unit required specific types of nursing care, such as vital sign monitoring every 15 minutes in the first hour, invasive hemodynamic monitoring, bed restrictions due to anesthesia emergence, administration of medications and procedures of hygiene and comfort. These features increase the level of dependency of the patient with regards to the nursing team, who needs to have specialized knowledge and skills for fast decision making in order to act in these contexts.[5]

The high demand of surgical patients and the few intensive care beds may result in an increased number of critical patients being cared by the workers in the postanesthesia recovery room. As a result, the nursing team must have specific knowledge regarding physiology, surgical procedures, and be able to manage potential complications.[18]

The NAS domains that stood out in this study were laboratory investigations (item two), drug administration (item three), and respiratory support (item nine), having respective scores of 63%, 93%, and 68%. Furthermore, the statements of the participants corroborate these findings, stating that these are activities that demand time, attention, and are part of the routine of the workers. These interventions have also been frequently carried out with other studies and population, with equally expressive data.[10,19]

Monitoring and control Support and attention to the relatives and patients, Administrative and managerial tasks, and Specific interventions outside of the PARR scored for 100% of patients, corroborating the findings of another study.[17] The high score in the item support and care to relatives and patients refers to the information and guidance offered by nurses to patients and their families. Specific interventions outside of the PARR relate to diagnostic exams, since it is not rare for patients to remain hospitalized, needing to be

transported to undergo said exams. Additionally, patients are transferred from the bed to the stretcher when they are discharged into the hospitalization unit. The qualitative and quantitative findings of the research, once again, converge, considering that the statements also pointed at the high turnover of patients in the sector as contributing to increase nursing workload, leading to administrative and assistance demands.

As a result, the nurse must perform numerous activities, many of which are related to indirect assistance to the patient, such as administrative and managerial activities (item eight), which had an expressive score in the NAS of this study. These activities, only carried out by the nurse, are often seen as secondary to other situations that the nurses consider more urgent. Authors state that the work process must be re-examined, so that more time is available to carry out specific professional activities that are involved in patient care.[20]

The high NAS found in this investigation converges with the statements of the nursing workers, who report a high workload. This is in accordance to studies that address issues related to workers' health. In general, the routine nursing work process is demanding, and requires abilities and responsibilities to be performed. These aspects influence in the quality of life of the nursing professional.[21] Moreover, this study found that the sizing of personnel is essential to prevent constant work overload, minimizing professional exhaustion and preserving the health of the workers.

The results presented in this investigation may contribute to organize the working process of the PARR nursing team, especially with regards to the sizing of personnel and the workload required by each patient. Nurses, in the division and organization of labor, must be aware of this factor, minimizing the work overload of the professionals. These results also aim to contribute for an increase in the number of publications about the theme. It stands out that the use of the mixed-methods sequential explanatory design contributed to further the

understanding of this problem, since the qualitative findings helped understanding the results of the quantitative findings collected at first.

The limitations of this study are related to the scarce production of studies that use the NAS in a setting of anesthesia recovery, limiting comparisons. Additionally, the use of the NAS based on nursing records presents some issues, since some activities may have been carried out but not registered, and therefore, would not score in the instrument.

The instrument should be applied in this type of setting in new studies, to broaden the investigative field and allow comparisons. Considering the results found, some recommendations can be offered to nursing assistance: the routine measuring of workload, in order to distribute patients per professional according to their demands of care, contributing to soften work overload; and the re-evaluation of the sizing of nursing personnel per shift, based on the context of the institution/unit being studied.

Conclusion

Patients who were hospitalized in the PARR in the period studied were mainly male (55.5%), coming from the Surgical Clinic of the hospital (38.28%), followed by those from the Emergency Unit (33.0%). In this investigation, the workload of the nursing team, as analyzed quantitatively using the NAS, was found to be high. Each patient requires nearly 57% of the time of a worker, but each nursing professional needs to care for three or four patients every shift.

The perception that workers expressed with regards to workload in the interviews allowed for a better and deeper understanding of the results obtained in the quantitative instrument. The statements were organized in two categories: Characteristics of patients and situations that are determinant for workload, and Work organization: characteristics that influence workload. The first one showed that unstable patients that require critical care are the

ones that generate the most workload for the nursing team. In the second, workers report that the lack of hospital beds diminishes turnover, which means that patients stay in the recovery room, influencing the workload. A reevaluation of personnel sizing is also necessary, considering the evidences of work overload.

Quantitative and qualitative data were in accordance. An analysis that involves both quantitative and qualitative data makes it possible to identify the workload and the length of nursing assistance, adapting the number of professionals for a specific demand for care and offering safe work conditions for the team and the patients.

The use of the NAS instrument was adequate for the objectives of the study, since, due to local specificities, it was possible to find which nursing activities were carried out by each individual worker, thus generating a result that is closer to the real workload values.

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Corresponding author:
Name: Ana Lúcia Uberti Pinheiro
E-mail: aninhaupinheiro@yahoo.com.br
Address: Rua Araújo Viana, 545/404. Santa Maria/RS.
CEP: 97015-040

Author contributions:

1 – Ana Lúcia Uberti Pinheiro
Participated in the conception and planning of the research project, as well as in the obtention, analysis and interpretation of data, and in the writing of the manuscript.

2 – Quézia Boeira da Cunha

Took part in in the conception and planning of the research project, as well as in the obtention of data and in the writing of the manuscript.

3 – Daiane Dal Pai
Took part in the critical review of the manuscript.

4 – Rosângela Marion da Silva
Took part in the critical review of the manuscript

5 – Suzinara Beatriz Soares de Lima
Took part in the critical review of the manuscript.

6 – Silviamar Camponogara
Took part in in the conception and planning of the research project, as well as in the analysis of data and in the writing of the manuscript.

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