



## ASSOCIATION BETWEEN WORKLOAD AND ABSENTEEISM IN NURSING TECHNICIANS

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### ABSTRACT

**Objective:** to identify absenteeism of nursing technicians in an Intensive Care Unit and to verify the association between absenteeism and workload.

**Method:** cross-sectional retrospective study of documentary source and quantitative approach. It was performed in an adult intensive care unit with 4,920 measurements from the Nursing Activities Score in 2017, in order to extract the nursing workload, and control absenteeism, considering the absences recorded in the management register of the department. Descriptive and inferential statistical analysis was performed, dividing the intensive care unit into two groups (ICU I and ICU II), according to team shifts.

**Results:** in the period analyzed, 461 absences were observed, with a higher proportion in ICU II (5.35%, p-value=0.00). This group also had the highest Nursing Activities Score (99.76) average. However, workload and absenteeism showed no statistically significant correlation in the analyzed groups (ICU I, r=0.02 and ICU II, r=0.06).

**Conclusion:** there was no statistically significant association between absenteeism and workload of nursing technicians in the Intensive Care Unit. However, the team with the highest workload was the most absent.

**DESCRIPTORS:** Workload. Absenteeism. Human resource Management. Intensive care units. Nursing assistants. Nursing technicians.

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# ASSOCIAÇÃO ENTRE CARGA DE TRABALHO E ABSENTEÍSMO DE PROFISSIONAIS DE ENFERMAGEM DE NÍVEL MÉDIO

## RESUMO

**Objetivo:** identificar o absenteísmo da equipe de enfermagem de nível médio em uma Unidade de Terapia Intensiva e verificar a associação entre absenteísmo e carga de trabalho.

**Método:** estudo transversal, retrospectivo, de fonte documental e abordagem quantitativa. Foi realizado em uma Unidade de Terapia Intensiva para adultos com 4.920 mensurações do *Nursing Activities Score* no ano de 2017, para extrair a carga de trabalho da enfermagem, além do controle do absenteísmo, considerando as faltas registradas na planilha de gerenciamento do setor. Realizou-se análise estatística descritiva e inferencial, dividindo a Unidade de Terapia Intensiva em dois segmentos (UTI I e UTI II), de acordo com escalas de equipes.

**Resultados:** no período analisado, foram observadas 461 ausências, com maior proporção no segmento UTI II (5,35%,  $p$ -valor=0,00). Este segmento também apresentou maior média de pontuação do *Nursing Activities Score* (99,76). No entanto, a carga de trabalho e o absenteísmo não apresentaram correlação estatística significativa em ambos os segmentos analisados (UTI I,  $r=0,02$  e UTI II,  $r=0,06$ ).

**Conclusão:** não houve associação estatística significativa entre absenteísmo e carga de trabalho dos trabalhadores de enfermagem de nível médio da Unidade de Terapia Intensiva. Porém, a equipe com maior carga de trabalho foi a mais ausente.

**DESCRITORES:** Carga de trabalho. Absenteísmo. Administração de recursos humanos. Unidades de terapia intensiva. Assistentes de enfermagem. Técnicos de enfermagem.

# ASOCIACIÓN ENTRE CARGA DE TRABAJO Y ABSENTISMO EN PROFESIONALES DE ENFERMERÍA DE NIVEL MEDIO

## RESUMEN

**Objetivo:** determinar el absentismo del equipo de enfermería de nivel medio en unidad de terapia intensiva; verificar asociación entre absentismo y carga de trabajo.

**Método:** estudio transversal, retrospectivo, de fuente documental, con abordaje cuantitativo. Realizado en una unidad de terapia intensiva de adultos sobre 4.920 mediciones del *Nursing Activity Score* en 2017, para calcular la carga de trabajo y el absentismo en enfermería, considerando las faltas registradas en la correspondiente planilla. Se aplicó análisis estadístico descriptivo e inferencial, dividiendo en dos sectores la unidad (UTI I y UTI II), de acuerdo a grupos del equipo.

**Resultados:** se contabilizaron 461 ausencias en el período estudiado, con mayor proporción en UTI II (5,35,  $p$ -valor=0,00). El sector mostró también promedio mayor de puntuación del *Nursing Activities Score* (99,76). Sin embargo, la carga de trabajo y el absentismo no expresaron correlación estadística significativa entre los dos grupos analizados (UTI I,  $r=0,02$ ; UTI II,  $r=0,06$ ).

**Conclusión:** no existió asociación estadística significativa entre absentismo y carga de trabajo de los trabajadores de enfermería de nivel medio en la unidad de terapia intensiva. Sin embargo, el grupo con mayor carga de trabajo fue el que mostró mayor cantidad de inasistencias.

**DESCRITORES:** Carga de trabajo; Absentismo; Administración de personal; Unidades de cuidados intensivos; Asistentes de enfermería; Enfermeros no diplomados.

## INTRODUCTION

Work is a fundamental part of human life, but it can be a source of pain and illness due to mental and physical exhaustion. When focusing on nursing, the workloads to which professionals are exposed to can cause disabilities; absenteeism; wear and tear; occupational diseases; work accidents in various environments, conditions, organizations and contexts; early retirement and even death.<sup>1</sup>

It is important to recognize workloads in nursing, which are classified as biological, physical, chemical, mechanical, physiological and psychological.<sup>1</sup> Workloads tend to affect worker health through wear and tear, but also affect the organization/company by reducing productivity, represented mainly by absenteeism.<sup>2</sup>

People management indicators, especially absenteeism and worker turnover, directly or indirectly reflect worker health policies and managerial retention at work as they are used to monitor quality of care and quality of life at work.<sup>3</sup> Thus, when high, they influence patient care, the possibility of overloading the team's components and a tendency to favor illness and professional demotivation.<sup>3-4</sup>

The term absenteeism has been used since the industrial period to designate the employee's absence from work. Thus, they reflect the sum of periods in which employees of a particular organization are away from work, which corresponds to absences when they were expected to be present.<sup>4-5</sup>

The study of absenteeism in hospital nursing supports the planning and adjustment of human resources by considering the uninterrupted character of nursing work in the 24 hours of daily patient care.<sup>6</sup> In addition, as an indicator of people management quality, it is considered whether there is some relationship between absenteeism and nursing workload.<sup>7</sup>

In the Intensive Care Units (ICU) context, a systematic literature review found that the workload of the nursing staff may be related to increased infections, pressure injuries, and medication administration errors.<sup>8</sup> Despite this finding, another literature review points out that people management indicators, such as absenteeism, are studied to a lesser extent than those related to direct care,<sup>7</sup> which reinforces the need for further studies.

In nursing human resources management, there are instruments that determine the need to provide care to the patient and, consequently, measure the workload of the nursing staff workload, supporting staff dimensioning.<sup>9</sup> A widely disseminated instrument recommended for the intensive care setting is the Nursing Activities Score (NAS), which, through the sum of the points, measures the percentage of nursing time devoted to direct and indirect patient care over a 24-hour period.<sup>10</sup>

Considering that absenteeism is a recognized problem in hospital nursing, studies on this subject need to be deepened in order to relate and support decision-making towards its reduction, and the potential of scientific studies to increase people management. Thus, it is questioned: What is the situation of absenteeism in ICU nursing technicians in an ICU? Is there an association between absenteeism and workload? Thus, the objective is to identify absenteeism of nursing technicians in an intensive care unit and to verify the association between absenteeism and workload.

## METHOD

A cross-sectional retrospective study of documentary source with a quantitative approach performed in a university hospital in the state of Paraná, Brazil, which has 215 beds exclusively for the Unified Health System (Sistema Único de Saúde - SUS) for the care of an estimated population of two million inhabitants. In turn, the research field itself was the adult ICU of the studied hospital, which has 14 general intensive care beds.

The research involved data from which were collected from January to December 2017. Data collection was performed by a nurse resident in Nursing Management in Medical and Surgical Clinic,

and supervised by another nurse, PhD in Nursing and a teacher in the field of Nursing Services Management. The collection took place between February and April 2018, using records of work absences (absenteeism) and nursing workload (NAS), completed by ICU nurses, in Nursing Management spreadsheets. All documentary records were extracted/obtained from the Nursing Directorate of the hospital that centralizes information on people management from all areas of the organization.

In the present study, the evaluation of absenteeism and nursing staff workload was restricted to nursing technicians and nursing assistants, considering that the management worksheet was completed by the nurse; Thus, in the absence of this professional, another professional performed their function and was not recorded in the management spreadsheet.

The term “lost work day” was considered as any unjustified absence, absence justified by medical certificates or other unplanned/planned absence. Vacations, time off and leave were not considered absenteeism, as they were previously scheduled. Despite the understanding of “lost or absent day” in monitoring absenteeism, absences were computed by a professional, i.e, as “absent worker”, as well as presences, as “worker present”.

The monthly nursing management worksheet recorded the daily workload of the sector measured by the NAS of each patient admitted to the ICU. The NAS is a nursing workload measurement tool adapted to the reality of intensive care, which can be considered an indicator for estimating staff numbers, as well as to assist in the calculation of the Nursing Services budget.<sup>10</sup> All NAS values recorded in the established timeframe were computed.

The NAS is divided into 23 items, in the following domains: basic activities, ventilatory support, cardiovascular support, renal support, neurological support, metabolic support and specific interventions.<sup>10</sup> The total score obtained represents the percentage of time spent by the nursing professional on patient care and other workload items, ranging from 0 to 176.8 points. The higher the score, the higher the degree of patient dependence and, consequently, the nursing workload.<sup>10</sup>

Manually collected data were entered and stored in a spreadsheet created in Microsoft Office Excel® software, version 2013. Data analysis was performed using descriptive and inferential statistics, using the same technological tool, with the assistance of a professional specialized in the area.

The ICU nursing team workload was measured by descriptive statistics, using a central tendency measure (mean NAS obtained from total NAS points divided by total patients evaluated by the instrument) and standard deviation. Absenteeism was analyzed by the annual proportion (%) of absences in relation to the number of professionals present, being calculated by ICU I and II, work shift and month.

Data analysis divided between ICU groups called ICU I and ICU II was intentional, since in the sector there are two distinct teams, although they are within the same physical space in the institution, with single entry. However, the unit has sequentially numbered beds, with seven beds for each care station, which represent dismembered work scales for teams I and II.

The analysis of the association between workload and nursing staff absenteeism was performed using Pearson’s correlation, calculated by ICU group I and II. Subsequently, the proportion of absenteeism in the two ICU groups was compared using the Z test ( $\alpha = 0.05$ ). In all inferential analyzes, the significance of association was accepted based on a margin of error of 5%, expressed as  $p\text{-value} \leq 0.05$ .

The null hypothesis Z-test assumes that the proportions of two populations are equal and can be used to determine if there is a difference in the proportion of successes in the two groups (two-tailed test) or if one of the groups has a higher proportion of successes than the the other group (one-tailed test).<sup>11</sup>

The Z-test for proportions was also applied to verify the existence of significant difference between the work shifts of each ICU group (morning-afternoon, morning-night and late-night).

All ethical requirements governing research with human beings that are set forth in Resolution No. 466/2012 of the National Health Council were respected.

## RESULTS

In total, 4,920 NAS measurements were made in the year under review. There were 461 cases of absenteeism among ICU nursing technicians. It was observed that the ICU II group had a higher proportion of absences when compared to ICU I. The average NAS was higher in ICU II, where the minimum and maximum values were also higher when compared to those in ICU I. There was no association between the variables “workload” and “absenteeism” in any ICU group, as shown in Table 1.

**Table 1 – Workload and absenteeism of nursing technicians according to Intensive Care Unit (ICU) group. Cascavel, PR, Brazil, 2017**

	Total absences	Scale total	%	Nursing Activities Score				r*	p-value
				Minimum	Maximum	Average	Standard deviation		
ICU I	173	5392	3,21	38,4	141,2	98,37	7,17	0,02	0,69
ICU II	288	5385	5,35	57,1	142,2	99,76	8,27	0,07	0,20

Regarding the difference between the rates of absenteeism of the ICU groups, it was evident that the proportion of absences in the ICU II (5.35%) was significantly higher than in the ICU I (3.21%), since, in the test for comparison between proportions, a p-value = 0.00 was found.

The months with the highest incidence of morning shift absences were August, September, and October, with the highest absence in the ICU II group (Table 2). In the afternoon, January in ICU I had the highest number of absences. Regarding the night shift, it is observed that they occurred more frequently in October in ICU I.

**Table 2 – Absolute number (n) and percentage (%) of absences of nursing technicians per month, work shift and Intensive Care Unit group. Cascavel, PR, Brazil, 2017**

Month	ICU* I						ICU* II					
	AM		PM		Night		AM		PM		Night	
	n	%	n	%	n	%	n	%	n	%	n	%
January	2	4	18	29	1	1,6	4	2,7	3	4,3	5	7,2
February	4	8	1	1,6	5	8,2	5	3,4	6	8,6	2	2,7
March	12	24	4	6,5	7	11,5	3	2,0	12	17,1	7	10
April	2	4	3	4,8	2	3,3	17	11,5	3	4,3	3	4,3
May	1	2	3	4,8	1	1,6	1	0,7	11	15,8	9	12,8
June	-	-	-	-	1	1,6	3	2,0	6	8,6	7	10
July	5	10	10	16,1	3	4,9	8	5,4	7	10	6	8,6
August	2	4	4	6,5	6	9,8	29	19,6	7	10	5	7,2
September	4	8	4	6,5	4	6,6	38	25,7	2	2,7	12	17,1
October	12	24	2	3,2	16	26,2	20	13,5	4	5,7	5	7,2
November	2	4	5	8,1	11	18,1	9	6,1	6	8,6	4	5,7
December	4	8	8	12,9	4	6,6	11	7,4	3	4,3	5	7,2
Total	50	100	62	100	61	100	148	100	70	100	70	100

As shown in Table 2, the morning shift in ICU II had the highest rate of absences. In the proportions test, it was found that the morning shift showed a significant difference in relation to the afternoon and evening shifts ( $p$ -value=0.00) for the ICU II group. No significant differences were found in the other combinations between shifts.

## DISCUSSION

It was observed that the workload measured by the NAS obtained high values, with an annual average of 98.37 points per patient in the ICU I group and 99.76 points in the ICU II group. These scores can be considered high when compared to those found in recent literature, with an average of 75.65 points in the data set of total patients for a study conducted in two ICUs, one for the care of chronic and surgical clinical and surgical patients and one for emergency care.<sup>12</sup>

In another study that aimed to identify the workload and absenteeism rates of nursing staff in an adult ICU of a teaching hospital, even the maximum NAS value found was lower than the average of the present study. The average NAS was 66.9 points, with a minimum of 49.3 and a maximum of 94.6 points.<sup>13</sup> Researchers highlight that by applying the NAS in the adult ICU in Brazil, the average values of nursing workload were found to be between 61.97 and 81.2, i.e., values above what is considered overload ( $NAS \geq 51\%$ ).<sup>14</sup>

A study conducted in the trauma ICU indicated an average nursing workload of 73.40 points (minimum of 35.00 and maximum of 123.00 points), a result that characterizes high workload, and is approximately the same or higher than in other Brazilian studies. This result is important, as it shows that trauma ICU patients require intense care from nursing staff.<sup>15</sup> However, when compared with the study presented here, it also has lower mean NAS values.

Considering the literature consulted, it is clear that patients in the studied ICU demand high workload from the nursing staff, which may be a product of the care profile of the sector, which often serves victims of trauma treated with neurosurgery.<sup>16</sup>

Regarding the inferential analysis on the association between workload and ICU absenteeism, it was found that there was no significant relationship between the variables in either ICU groups. Nonetheless, it is considered that fully refuting this association, although not verifiable in the light of statistics, is counterproductive and/or premature, because absenteeism has in fact already been associated with the workload measured by the ratio between mean number of patients and the average number of nursing professionals per day,<sup>17</sup> i.e., differently from this study, which dealt with the measurement of nursing workload according to NAS.

In literature studies, the relationships between absenteeism and working conditions, especially in hospitals, have been highlighted by the constant rotation of hours, long working hours, overtime, plurality of functions, fast work rhythm and work overload.<sup>13</sup>

The absence of a member of the nursing team has a negative impact, as it generates more work for those present, effects work organization, demotivates employees who are relocated to the service, decreases the quality of care provided to patients and favors the occurrence of adverse events.<sup>18-20</sup> In addition, this situation contributes to the development of physical and mental disorders in workers. Consequently, a cascade of problems arises, such as illness and increased absenteeism.<sup>18-19</sup>

Measuring the absenteeism rate is one of the challenges faced by managers, since there is no unanimous data on the universal indices or how to calculate and estimate the magnitude of absenteeism.<sup>18</sup> In this context, it is understood that the causes of absenteeism cannot be attributed only to the worker, because work dissatisfaction may cause absences, whether due to sick leave or unjustified absences, which may be related to work overload, poor supervisory processes, poor interpersonal relationships and the management strategies adopted by the institution.<sup>19</sup>

A study on the reasons for absenteeism highlighted that, in order to minimize the indicator, professionals listed the maintenance of a motivating organizational climate, teamwork and psychological support to cope with stressful situations of the unit.<sup>19</sup>

Regarding the rate of absenteeism, rates of 3.21% were found in the ICU I group and 5.35% in the ICU II. This difference was measured by hypothesis testing for comparison between proportions, where a p-value <0.05 was observed, indicating that the data were significantly different. In ICU II, the rate was higher, however, regarding clinical practice, it is known that patients admitted in both groups (ICU I and II) have a similar profile (corroborating the similar NAS value average, although higher in ICU II), which leads us to consider the possibility of the influence of intrinsic factors of the team in this location, as well as the inherent characteristics of each worker.

From this study, it is hypothesized that teamwork may be a factor influencing absenteeism rates, since when the similar workload is evidenced and yet one location has more employee absences, it is concluded that the lack of companionship, peer support in daily activities, and other factors that are difficult to measure may influence the decision not to attend work. In addition, personal characteristics have not been compiled, such as age, presence of comorbidities, among other items that may knowingly increase the chance of being absent from work.

Absenteeism rates may change from one hospital reality to another, and knowledge of these rates allows adequate nursing staff dimensioning, as well as favoring professional satisfaction at work.<sup>13</sup> Regarding the ICU, the literature demonstrates that the pattern of absenteeism causes are the same as in other sectors. However, in this environment, time off and work overload problems and difficulty maintaining efficiency appear to be even more critical.<sup>13</sup>

When the absences related to the work shift were analyzed, the results of the study presented here show that the morning shift presented the highest incidence in the ICU II group, and was statistically significant in relation to the afternoon and evening shifts, which had identical values for absences. This fact is in line with data from another study that used a sample of professionals working in the various department of two hospitals, which showed lower occurrences of sick leave in the night shift, and the highest rate occurred in the morning.<sup>5</sup> However, it differs from a study that also had the nursing staff of the entire hospital as its population, which pointed out the night shift with the highest incidence of absences (39.4%), followed by the morning (24.1%) and afternoon ( and workers working business hours 11.9%).<sup>21</sup>

Considering the results in question and the literature consulted, it is necessary to make another reflection on the relationship between workload and absenteeism, as, once there is a discrepancy in the number of absences in the ICU II group, which shows the morning period as the more incident to absenteeism, it is worth considering that this period may be the one that includes the largest amount of activities for the nursing staff, this increasing their workload.

In contrast to the above, the morning shift in the ICU I group did not have the most incidences of absenteeism, and the values between the three shifts were not as discrepant as in the ICU II group. This again raises the question of the characteristics of work teams as something to be considered when studying absenteeism and the dynamics of people management itself.

October, March and January had the highest number of absences in ICU I, with 30, 23 and 21 absences, respectively. The highest number of absences in the ICU II group occurred in September, August and October, with 52, 41 and 29 cases of absence, respectively. The month with the least missing ICU I employees was June, with one case; and for ICU II, there were 12 cases in January.

A study conducted in a public hospital in Santa Catarina highlighted that autumn and winter have the highest number of absences.<sup>21</sup> It should be noted that the knowledge of absenteeism over a single year may not be sufficient to infer the period with more cases of absences at work beyond the period (year) studied.

The qualification of health professionals is a fundamental aspect for the quality of patient care services. Thus, there is a need to value health workers, provide them with opportunities to expand and update knowledge, and establish such activities as opportune moments for worker motivation and social life at work.<sup>5</sup>

The need for organizations to have absence control programs that identify the causes and verify the justifications of absences is emphasized, and that these devices pass on information to workers. In addition, it is necessary to encourage the participation of professionals in activities in order to improve the quality of teamwork, improving the working climate, thus reducing absenteeism and increasing the professional's quality of life, which will reflect on the care provided to the health care user.

In human resource management, the indicators allow the basis for analyzing, comparing and discussing the possible series to consistently reach the forecasting and provision of human capital, as well as their best application. NAS and absenteeism can contribute to the development of strategies aimed at improving care and the appropriate dimensioning of nursing staff.<sup>15</sup>

It should be noted that absenteeism can also be underreported in the organization, especially by the knowledge, albeit empirical, that the request for overtime is a common managerial action, which may or may not be directly related to work absences. In addition, although no association was found between absenteeism and workload in this study, the need for further investigations into absenteeism in this context is reinforced, including more participatory study approaches.

Another important issue, recognized together with the study, was the NAS average discrepancy compared to other realities perhaps similar to the ICU care context investigated. This refers to the possible need to investigate the accuracy of nurses in the use of this care management instrument and nursing workload measurement.

Therefore, the researchers propose the return of the results to the nursing management of the investigated unit, the occupational medicine sector and the hospital's Permanent Education service, so that opportunities for improvement can be discussed and planned collectively.

It is postulated that the main limitations of this study are related to its performance in a single hospital, based on the records registered on management spreadsheets, which reflects the possibility of underreporting of absences and the reasons for absenteeism not being recorded.

Although there are other limitations of the study, such as the impossibility of inferring the results to ICU nurses, and the entire nursing team for units and organizations outside the investigated reality, it is believed that there is no doubt about its potential to add to the knowledge regarding nursing human resources management, with emphasis on ICU. In addition to being reaffirmed as an people management indicator, absenteeism was also investigated in the context of workload measurement, which is clearly relevant to the managerial work of nurses.

## CONCLUSION

It was concluded that there was no statistically significant association between absenteeism and workload in ICU nursing technicians, however the team with the highest workload was the most absent. The ICU II group presented the highest proportion of absences, including a significant difference in relation to the ICU I group. In the group with the highest number of absences, the morning period stood out in the total of absent workers, obtaining statistical significance in relation to the other shifts.

It is believed that the data obtained provide support the ICU work scale, and also raises the issue of teamwork, interpersonal relationship and knowledge about the workload measurement instrument by nurses. This research encourages the elaboration of new studies aimed at investigating the causal variables of absenteeism and its repercussions on direct care.



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## NOTES

### ORIGIN OF THE ARTICLE

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### CONTRIBUTION OF AUTHORITY

Study design: Feldhaus C, Oliveira JLC.

Data collection: Feldhaus C.

Analysis and interpretation of the data: Feldhaus C, Souza RF, Fernandes LM, Carvalho ARS, Bordin V, Oliveira JLC.

Discussion of the results: Feldhaus C, Souza RF, Fernandes LM, Carvalho ARS, Bordin V, Oliveira JLC.

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### ETHICS COMMITTEE IN RESEARCH

The research project is nationally registered under the Certificate of Presentation for Ethical Appreciation (CAEE) No. 80589417.5.0000.0107.

### CONFLICT OF INTEREST

There is no conflict of interest.

### HISTORICAL

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