The Sleep Quality Impact of Night and Day Employees in a Company Located in Southern Santa Catarina

O Impacto da Qualidade do Sono de Trabalhadores Noturnos e Diurnos Em Uma Empresa Localizada no Sul de Santa Catarina

El Impacto de la Calidad del Sueño de los Trabajadores Nocturnos y Diurnos en una Empresa Ubicada en el Sur de Santa Catarina

RESUMO

Objetivo: Analisar a qualidade do sono de funcionários de uma empresa e suas implicações na qualidade de vida e bem-estar no ambiente de trabalho. **Método:** Foi conduzido um estudo de caráter exploratório e descritivo de forma a avaliar quantitativamente e qualitativamente de maneira transversal o impacto da qualidade do sono de trabalhadores noturnos e diurnos em uma empresa localizada no Sul de Santa Catarina utilizando pontuações do Índice de Qualidade de Pittsburgh, Psycap Questionnaire e Brief Pain Inventory. **Resultado:** Os resultados indicaram que profissionais do turno noturno apresentaram níveis significativamente mais altos de otimismo e capital psicológico total em comparação ao turno matutino. No entanto, não foram encontradas associações significativas entre os turnos e as dimensões de autoeficácia, esperança, resiliência, intensidade ou interferência da dor, nem com a qualidade do sono. **Conclusão:** Contrariando a hipótese inicial, os trabalhadores noturnos apresentaram melhor capital psicológico e não relataram pior qualidade de sono — sendo os profissionais do turno comercial os mais impactados nesse aspecto, possivelmente devido à carga horária maior e à exigência cognitiva. Ainda que a dor relatada tenha sido leve, recomenda-se acompanhamento contínuo. Limitações metodológicas apontam a necessidade de estudos futuros com amostras maiores e variáveis individuais para aprofundar a análise dessas relações.

DESCRITORES: Sono; Trabalho em turnos; Ciclo Circadiano; Qualidade de Vida.

ABSTRACT

Objective: To analyze the sleep quality of a company's employees and its implications on quality of life and well-being in the work environment. **Method:** An exploratory and descriptive study was conducted in order to quantitatively and qualitatively evaluate, in a cross-sectional manner, the impact of sleep quality on night shift and day shift employees in a company located in Southern Santa Catarina, using scores from the Pittsburgh Sleep Quality Index, Psycap Questionnaire and Brief Pain Inventory. **Results:** The results revealed that night shift professionals showed significantly higher levels of optimism and overall psychological capital compared to the morning shift. However, no significant associations were found between shifts and the dimensions of self-efficacy, hope, resilience, pain intensity or interference, nor with sleep quality. **Conclusion:** Contrary to the initial hypothesis, night shift workers showed better psychological capital and did not report poorer sleep quality — with professionals on the day shift being the most affected in this regard, possibly due to longer working hours and higher cognitive demands. Although the reported pain was mild, continuous monitoring is recommended. Methodological limitations highlight the need for future studies with larger samples and individual variables to deepen the analysis of these relationships.

KEYWORDS: Sleep; Shift Work; Circadian Rhythm; Quality of Life

RESUMEN

Objetivo: Analizar la calidad del sueño de los empleados de una empresa y sus implicaciones en la calidad de vida y el bienestar en el ambiente laboral. **Método:** Se realizó un estudio de carácter exploratorio y descriptivo con el objetivo de evaluar cuantitativa y cualitativamente, de manera transversal, el impacto de la calidad del sueño de los trabajadores nocturnos y diurnos en una empresa ubicada en el sur de Santa Catarina, utilizando puntuaciones del Índice de Calidad del Sueño de Pittsburgh, Psycap

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Questionnaire y Brief Pain Inventory. **Resultado:** Los resultados revelaron que los profesionales del turno nocturno presentaron niveles significativamente más altos de optimismo y capital psicológico total en comparación con los del turno matutino. No obstante, no se encontraron asociaciones significativas entre los turnos y las dimensiones de autoeficacia, esperanza, resiliencia, intensidad o interferencia del dolor, ni con la calidad del sueño. **Conclusión:** Contrariamente a la hipótesis inicial, los trabajadores del turno nocturno presentaron un mejor capital psicológico y no reportaron una peor calidad del sueño — siendo los profesionales del turno comercial los más afectados en este aspecto, posiblemente debido a una mayor carga horaria y a la exigencia cognitiva. Aunque el dolor reportado fue leve, se recomienda un seguimiento continuo. Las limitaciones metodológicas señalan la necesidad de futuros estudios con muestras más amplias y variables individuales para profundizar en el análisis de estas relaciones.
DESCRIPTORES: Sueño; Trabajo en turnos; Ciclo Circadiano; Calidad de Vida.

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INTRODUCTION

Sleep is a physiological process essential for physical and mental well-being. During this process, the body reduces the activity of various systems, promoting the recovery of the immune, nervous, skeletal, and muscular systems, as well as consolidating functions such as memory and brain metabolism regulation. This cyclical state involves changes in consciousness, reduced sensory and muscular activity, and the display of brain patterns that are distinct from the waking phases[1].

The sleep cycle alternates between the phases of Non-Rapid Eye Movement (NREM) and Rapid Eye Movement (REM) sleep approximately every 90 minutes. The NREM sleep, which is predominant in the early hours of the night, is characterized by regular breathing and heart rate, while REM sleep, which is predominant in the second half of the night, is characterized by increased brain activity, loss of muscle tone, and intense dreams[2]. Adequate sleep quality and quantity are essential for maintaining physical and mental homeostasis. Changes in this pattern can compromise mood, cognition, and professional performance, in addition to increasing the risk of diseases such as obesity, hypertension, diabetes, and psychiatric disorders[3][4].

Sleep disorders affect between 10 and 20 million Brazilians. The most common are insomnia and obstructive sleep apnea syndrome [5]. Such disorders can lead to fragmented sleep, negatively affecting alertness, cognition, and emotional health. In addition, sleep disorders have been associated with a higher number of accidents, both in traffic and in the workplace [6].

Inadequate sleep is characterized by insufficient quantity or quality of rest to ensure optimal performance and health. According to epidemiological research, sleeping less than 7 hours per night is indicative of insufficient sleep [7]. Sleep deprivation and fragmentation cause significant physiological effects, such as changes in blood pressure, lower glucose tolerance, increased inflammatory markers, and reduced production of melatonin—a hormone essential for regulating the sleep-wake cycle [8][9].

A relevant factor in the growing deterioration of sleep quality in modern society is the reorganization of the labor market. With the demand for continuous productive activities over a 24-hour period, shift work has become common practice. This type

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of work organization includes irregular schedules, such as morning, night, weekend, and holiday shifts [10]. It is estimated that 13% to 14% of workers in the United States and Europe are involved in alternating shifts, a figure that is likely similar in Brazil, although no official data is available [11].

Shift work, especially night shifts, disrupts the natural circadian rhythm.

— a biological system regulated mainly by light. Exposure to artificial light at night inhibits melatonin production, impairing sleep and increasing the risk of metabolic and cardiovascular disorders and even cancer [12][13]. Night work is also linked to a higher prevalence of mental illnesses such as depression and post-traumatic stress disorder [14].

Several studies show that shift workers suffer from sleep disorders, absenteeism, occupational injuries, and decreased productivity [15]. However, much of this research is conducted in experimental settings, with little representation of the everyday reality of different occupations, regions, and cultures. There is, therefore, a significant knowledge gap regarding the real impact of work shifts on sleep quality in typical work environments, especially in Brazil.

Given this lack of contextualized studies, this study is justified by the need to understand, in greater depth, how different work shifts affect the sleep quality of Brazilian workers and, consequently, their physical, emotional, and social well-being. The relevance of this research is further amplified when considering that inadequate sleep can contribute not only to chronic diseases but also to operational risks, such as workplace accidents, errors in execution, and absenteeism.

The implicit hypothesis is that workers subjected to irregular shifts, especially night shifts, have a higher prevalence of sleep disorders, poorer quality of life, and greater intensity of physical pain compared to workers who work conventional hours. This is due to circadian rhythm dysfunction and greater exposure to psychosocial and physiological risk factors.

Given this, the objective of this study is to analyze how sleep quality affects employee well-being, considering factors that influence sleep efficiency, sleep patterns between different shifts, and the prevalence of associated disorders.

METHOD

This is an exploratory, descriptive study with a quantitative approach. It followed the methodological guidelines of the Pittsburgh Sleep Quality Index, Psycap Questionnaire, and Brief Pain Inventory instruments. The field was a chemical company located in southern Santa Catarina.

The target population of the study was the 179 employees of the company. Based on this number, the sample size to be used in this study was determined. The calculation considered a confidence level of 95% and a sampling error of 5.9%, resulting in a representative sample of 90 participants.

Ninety employees participated in the study, 15 female and 75 male, aged between 18 and 61, comprising 64 employees from the commercial shift, 13 from the morning shift, 7 from the afternoon shift, and 6 from the night shift, all employed by the company in the current year. The inclusion criteria were: employees who work at the company on both night and day shifts and commercial shifts, participants who agreed to participate in the study and sign the informed consent form, employees who are willing to fully answer the questionnaires during the study period. Exclusion criteria were: workers who did not wish to participate in the study and did not respond to it completely. The participation of volunteers was based on their agreement with the Free and Informed Consent Form (FICF), ensuring respect for the ethical principles of the study.

Data collection was carried out between March and May 2025, using three instruments. The first was the Pittsburgh Sleep Quality Index, a questionnaire consisting of 10 questions related to the participants' sleep habits. The second instrument applied was the Psycap Questionnaire, which investigates aspects such as well-being and performance in the workplace, through 12 questions. Finally, the Brief Pain Inventory was used, consisting of nine questions that assess pain intensity and its impact on daily activities, work, mood, and sleep, using a scale from 0 to 10 to classify pain intensity. All instruments were completed by participants via Google Forms, where the link was provided via email.

The Pittsburgh Sleep Quality Index was originally developed in the United States. It consists of seven components that assess different aspects of sleep over the past 30 days (subjective sleep quality, sleep latency, sleep duration, usual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction). The second instrument, the Psycap Questionnaire, was also developed in the United States to measure Positive Psychological Capital, which covers four psychological capacities (self-efficacy, hope, optimism, and resilience). Finally, the Brief Pain Inventory, which originated in the United States, is a widely used instrument to assess two major domains (pain intensity and the impact of pain on daily life).

The data were analyzed using the Shapiro-Wilk normality test, the nonparametric Kruskal-Wallis statistical test, the parametric ANOVA test, and Pearson's chi-square test. The level of significance adopted was 5% ($p < 0.05$). The analysis was performed using IBM SPSS version 21

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(Statistical Package for the Social Sciences) software.

This research was approved by the Research Ethics Committee (CEP) of the University of the Far South of Santa Catarina (UNESC) on December 13, 2024, under CAEE No. 85193024.4.0000.0119.

RESULTS

Table 1 shows the results of the PSYCAP 12 questionnaire when compared with the shifts.

The Kruskal-Wallis test did not indicate significant differences in scores between shifts in the dimensions Self-efficacy (p-value = 0.151), Hope (p-value = 0.151), and Resilience (p-value = 0.182).

The Kruskal-Wallis test indicated significant differences in scores in at least

1 of the shifts in the Optimism dimension (p-value = 0.022). According to the comparison test, the significant difference is in the optimism dimension scores between the morning and night shifts (p-value = 0.024), indicating slightly more optimism among professionals working at night compared to those working in the morning.

The ANOVA test indicated significant differences in final PSYCAP 12 scores in at least one of the shifts (p-value = 0.018). Tukey's multiple comparison test indicated higher positive psychological capital among night shift professionals (p-value = 0.044) and commercial shift professionals (p-value = 0.022) when compared to morning shift professionals.

Table 1 – PSYCAP 12 results x shifts. Santa Catarina, SC, Brazil, 2025.

PSYCAP 12 dimensions	Shift	n	Median	Min	Max	P-value
Self-efficacy	Commercial	64	13,0	9,0	15,0	0,151 - (b)
	Morning	13	12,0	7,0	15,0	
	Afternoon	7	12,0	10,0	15,0	
	Night	6	13,5	12,0	14,0	
Hope	Commercial	64	13,0	4,0	15,0	0,151 - (b)
	Morning	13	11,0	9,0	13,0	
	Afternoon	7	12,0	9,0	15,0	
	Night	6	13,0	9,0	15,0	
Resilience	Commercial	64	13,0	9,0	15,0	0,182 - (b)
	Morning	13	12,0	9,0	15,0	
	Afternoon	7	13,0	11.0	15,0	
	Night	6	14,0	1.1.0	15,0	
Optimism	Commercial	64	12,0	7,0	15,0	0,22 - (b)
	Morning	13	11,0*	7,0	13,0	
	Afternoon	7	12,0	9,0	13,0	
	Night	6	13,0*	13,0	15,0	

Total PSYCAP score 12	Shift	n	Médio	Desvio padrão	Mínimo	Máximo	P-valor
	Commercial	64	50,6	5,3	38,0	60,0	0,018* - (a)
	Morning	13	45,7	5,9	34,0	54,0	
	Afternoon	7	49,6	6,5	40,0	57,0	
	Night	6	52,8	4,5	45,0	59,0	

(a) Parametric ANOVA test
(b) Nonparametric Kruskal Wallis test
Source: Authors, 2025.

Table 2 shows the results for Pain Intensity x Shifts, with a significance level of 5% (0.05).

According to Pearson's Chi-Square test, there was no significant association between pain intensity and the shift of the professionals surveyed (p-value = 0.814).

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Table 2 – Results for Pain Intensity x Shifts. Santa Catarina, SC, Brazil, 2025

Shift	Pain Intensity			Total	P-value
	Intense pain	Mild pain	Moderate pain		
Commercial	3 4,9%	43 70,5%	15 24,6%	61 100,0%	0,814
Morning	0 0,0%	9 69,2%	4 30,8%	13 100,0%	
Afternoon	0 0,0%	3 50,0%	3 50,0%	6 100,0%	
Night	0 0,0%	4 66,7%	2 33,3%	6 100,0%	
Total	3 3,5%	59 68,6%	24 27,9%	86 100,0%	

Source: Authors, 2025.

Table 3 shows the results for Pain Interference x Shifts, also with a significance level of 5% (0.05).

It can be observed that, according to Pearson's Chi-Square test, there was no significant association between pain interference and the shift of the professionals surveyed (p-value = 0.418).

Table 3 – Results of Pain Interference x Shifts. Santa Catarina, SC, Brazil, 2025.

Shift	Pain interference		Total	P-value
	non-significant impact	significant impact		
Commercial	54 88,5%	7 11,5%	61 100,0%	0,418
Morning	10 76,9%	3 23,1%	13 100,0%	
Afternoon	4 66,7%	2 33,3%	6 100,0%	
Night	5 83,3%	1 16,7%	6 100,0%	
Total	73 84,9%	13 15,1%	86 100,0%	

Source: Authors, 2025.

Table 4 shows the results for PSQI x Shifts, with a significance level of 5% (0.05).

According to Pearson's Chi-square test, there was no significant association between sleep quality (measured by PSQl) and the shift of the professionals surveyed (p-value = 0.362).

Table 4 – PSQI x Shifts. Santa Catarina, SC, Brazil, 2025.

Shift	PSQI			Total	P-value
	Sleep quality considered average	poor sleep quality	Sleep quality considered good		
Commercial	12 18,8%	11 17,2%	41 64,1%	61 100,0%	0,362
Morning	3 23,1%	2 15,4%	8 61,5%	13 100,0%	
Afternoon	3 42,9%	0 0,0%	4 57,1%	6 100,0%	
Night	0 0,0%	0 0,0%	6 100,0%	6 100,0%	
Total	18 20,0%	13 14,4%	59 65,6%	86 100,0%	

Source: Authors, 2025.

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DISCUSSION

The data from this study reveal that the work schedule significantly interferes with the psychological dimensions, pain perception, and sleep quality of employees. In particular, night shift workers had higher averages in the four dimensions of PsyCap (self-efficacy, hope, resilience, and optimism). These results suggest a greater ability to adapt to the demands of night work, possibly favored by continuous exposure to this context, which encourages the development of coping strategies. This interpretation is consistent with the literature, which points out that high-demand work environments require the mobilization of internal resources to adapt to daily life and cope with the pressure, stress, and fatigue associated with these conditions [16].

Despite the lack of studies directly comparing PsyCap levels between different shifts, previous studies show that workers with greater psychological capital tend to perform better, have greater well-being, and experience less emotional exhaustion in challenging contexts. Thus, it is plausible to consider that night shift employees develop or strengthen characteristics such as resilience and optimism in response to the particularities of their workday, which corroborates the findings of this study [17][18].

With regard to pain, most participants reported mild intensity, with the most severe cases occurring during the morning shift, while the afternoon shift had the highest proportion of reports of moderate pain. Even so, for 84.9% of employees, pain did not significantly interfere with their daily activities. In contrast, previous studies indicate that moderate to severe pain can compromise occupational performance and increase absenteeism rates, pointing to the importance of considering the impact of pain in different work contexts [19].

Regarding sleep quality, night shift workers reported better indicators, while 17.2% of commercial shift workers showed signs of impaired sleep. This pattern may be related to how routines and rest periods are organized in each shift. Evidence from the literature indicates that night workers who work seven consecutive nights tend to have better circadian rhythm adaptation and, consequently, greater sleep regularity and quality when compared to those with shorter and interspersed shifts [20].

Another factor that may explain the poorer sleep quality during commercial shifts is the long working hours, usually nine hours, which reduce the time available for physical and mental recovery. A study of shift workers showed that working more than eight hours a day is associated with greater sleep impairment and lower levels of psychological capital, highlighting the negative impacts of work overload on mental health and well-being [21].

In addition, the content of activities performed during commercial shifts (predominantly administrative and cognitive) tends to generate greater mental load and high levels of stress, which can also impair rest. Studies with workers subjected to rapid shift rotation show that poor adaptation to night work increases mental fatigue and cognitive deficits, effects that are similar to those found in cognitively demanding contexts, such as the commercial shift [22][23].

These findings reinforce the evidence highlighting the restorative role of quality sleep on fundamental dimensions of PsyCap, such as self-confidence, hope, optimism, and resilience, which are essential skills in preventing occupational exhaustion and burnout syndrome. Thus, it is recommended that interventions aimed at promoting occupational health consider not only the shift itself, but also the specificities of the tasks performed and the organization of the workday [23].

CONCLUSION

It can be concluded that the results of this study demonstrate that sleep quality, pain perception, and psychological capital levels vary according to the work shift of employees, contesting the initial hypothesis of the research that night workers would have poorer sleep quality.

In fact, commercial shift workers reported the greatest losses in this regard. This difference may be related to the longer working hours in this shift, which totals nine hours per day, in contrast to the other shifts, which have a seven-hour workload. In addition, the commercial shift is predominant in the administrative sector of industry, where cognitive activities are performed, which require greater mental effort and may contribute to a possible state of stress.

Night workers had higher levels of psychological capital, which may indicate an adaptation to the specific demands of their shift. This factor can be exercised as an important coping resource in the face of the challenges of working atypical hours.

With regard to pain, although most participants reported mild intensity and low interference in daily activities, there is a need for continuous monitoring, especially in shifts with a higher workload.

Despite its contributions, this study has limitations that open up space for future research. The sample size of only 50% of the total number of employees, the reduced representation of the night shift, and the absence of individual variables, such as lifestyle habits and routine outside the workplace, make it difficult to draw a definitive conclusion as to whether the work shift is directly related to the differences observed in

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this study.

Future research is extremely important to deepen our understanding of these relationships, with larger samples, in order to address the night shift in particular, as well as methodologies that enable the monitoring and adaptation of workers over time.

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