

The impact of perceived stress and burnout on the attention span of anaesthesia and intensive care nurses: a study conducted in the Kenitra-Rabat-Salé region of Morocco

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ABSTRACT

Background

The study involved 134 nurses working in anesthesia and intensive care units in the Rabat-Salé-Kénitra region, predominantly women (68%) and married (60%), with a mean age of 35.8 years and 18 years of professional experience. Psychometric evaluation confirmed good reliability of the burnout scale ($\alpha = 0.81$) and the PSS-10 ($\alpha = 0.81$).

Result

Results revealed substantial exposure to occupational stress and burnout, with high levels of emotional exhaustion (47.8%) and depersonalization (50.7%), while nearly half of participants reported high personal accomplishment. Although most nurses presented low to moderate levels of burnout (73.1%) and stress (78.4%), a significant proportion experienced high levels ($p < 0.001$). Attentional assessment showed that 59.7% of nurses were attentive and focused, whereas 40.3% exhibited attentional difficulties or impulsivity. Burnout (OR = 9.03) and perceived stress (OR = 3.39) were significantly associated with impaired attention. Multivariate analysis demonstrated strong explanatory power ($R^2 = 0.727$), identifying age and professional grade as significant predictors of adaptive attentional performance. Unexpectedly, global burnout was positively associated with adaptive attention, possibly reflecting compensatory mechanisms or methodological bias, while perceived stress was not significant.

Conclusion

Overall, the findings highlight the coexistence of moderate general profiles with a vulnerable high-risk subgroup, underlining the impact of burnout and stress on attentional functioning in high-demand clinical settings.

Keywords

Burnout; Perceived stress; Attentional performance; Nurses; Anesthesia; Intensive care; D2R test; Cognitive performance; Morocco

INTRODUCTION

According to the literature review, professional stress in the medical context, both before¹⁻² and after COVID-19, has become a major public health issue³⁻⁴, particularly in hospital settings characterized by high emotional⁵ and cognitive demands⁶. Nurses working in anesthesia and intensive care are confronted with complex clinical situations, rapid decision-making, and a high mental workload, which exposes them to significant levels of perceived stress and an increased risk of burnout. Burnout, defined as a syndrome resulting from chronic workplace stress, is mainly characterized by emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment⁸. In this context, numerous studies have shown that chronic stress and burnout are not limited

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to psychological consequences but also affect cognitive functions, particularly attention, memory, and executive functions⁹⁻¹⁰. In particular, burnout is associated with a significant decline in attentional capacities and information processing speed, which may compromise professional performance and patient safety¹¹. Moreover, nurses in critical care units, such as those working in anesthesia and intensive care, are exposed to an intense mental workload, which is a key determinant of burnout¹². The increase in cognitive load is strongly correlated with emotional exhaustion and deterioration in professional well-being. In developing countries, particularly in Morocco, these issues are often exacerbated by organizational constraints, a lack of human and material resources, as well as demanding working conditions¹³⁻¹⁴. However, studies specifically examining the impact of perceived stress and burnout on the attentional functions of specialized nurses remain limited. Therefore, this study aims to analyze the influence of perceived stress and burnout on attentional functions among anesthesia and intensive care nurses in Morocco, in order to better understand the underlying mechanisms and contribute to improving working conditions and the quality of care.

MATERIALS AND METHODS

Study Design and Setting

This study is a quantitative, cross-sectional, and analytical investigation aiming to assess the effect of perceived stress and burnout on the attentional capacities of nurses working in anesthesia and intensive care units. The study was conducted among a sample of 134 nurses working in anesthesia and intensive care departments in public and private healthcare institutions within the Rabat–Salé–Kénitra region (Morocco), particularly in the provinces of Rabat, Salé, and Kénitra. Data collection was carried out over the period 2025–2026. The inclusion criteria were: state-certified nurses working in anesthesia or intensive care units in the Rabat–Salé–Kénitra region who provided informed consent to participate. Exclusion criteria included a history of neurological or psychiatric disorders, the use of psychoactive substances or medications that may affect cognitive functions, and refusal to participate. The sample size was estimated based on the expected prevalence of burnout, using a 95% confidence level and a 5% margin of error.

MEASUREMENT INSTRUMENTS

a. Sociodemographic, Professional, and Psychoaffective Data

A structured questionnaire was used to collect information on age, sex, years of professional experience, type of department, weekly workload, and number of night shifts/on-call duties. Perceived stress was assessed using the **Perceived Stress Scale (PSS-10)** (15-16), an internationally validated instrument consisting of 10 items rated on a Likert scale ranging from 0 to 4. The total score ranges from 0 to 40, with higher scores indicating higher perceived stress. Stress levels were categorized as follows: 0–13: low stress, 14–26: moderate stress and 27–40: high stress. Burnout was measured using the Maslach Burnout Inventory (MBI) (17), which evaluates three dimensions: emotional exhaustion, depersonalization and personal accomplishment. The interpretation thresholds used were: Emotional exhaustion (items 1, 2, 3, 6, 8, 13, 14, 16, 20): < 17: low, 18–29: moderate ≥ 30: high Depersonalization (items 5, 10, 11, 15, 22): < 5: low 6–11: moderate ≥ 12: high Personal accomplishment (items 4, 7, 9, 12, 17, 18, 19, 21): ≥ 40: low burnout 34–39: moderate ≤ 33: high burnout

b. Assessment of Attentional Capacities

Attentional capacities were assessed using the d2-R test (Brickenkamp), a standardized visual cancellation task requiring participants to identify the letter “d” with two dashes among visually similar distractors. This test provides several cognitive indices, including:

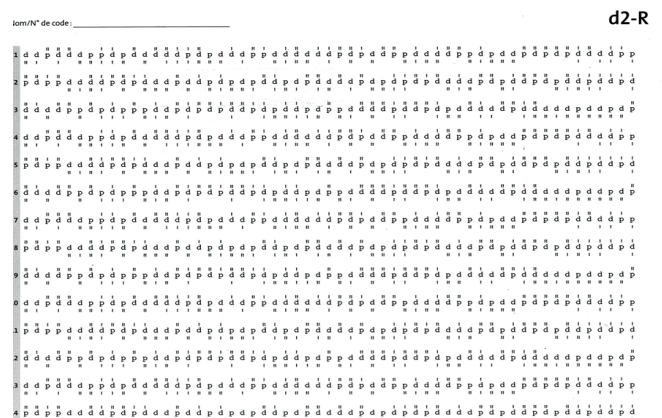


Figure 2. d2-R Test Administration Sheet

CCT, reflecting work pace or processing speed and E%, reflecting accuracy in information processing (18),

The d2-R test is widely recognized for assessing vigilance, selective attention, and processing speed, which are cognitive functions particularly sensitive to the effects of occupational stress and burnout.

Data Collection Procedure

Data were collected in person within the healthcare facilities of the Rabat–Salé–Kénitra region. Participants completed the sociodemographic questionnaire, the PSS-10, and the MBI. Subsequently, the d2-R test was administered under standardized conditions. Informed consent was obtained from all participants prior to their inclusion in the study. The d2-R test was conducted in a calm environment to reduce potential bias related to fatigue, noise, or environmental distractions.

Statistical Analysis

Data analysis involved both descriptive and inferential methods. Qualitative variables were summarized as frequencies and percentages, while quantitative variables were described using measures of central tendency and dispersion. Associations between variables were assessed using the Chi-square test, along with the estimation of odds ratios (OR) and their corresponding 95% confidence intervals. A binary logistic regression model was conducted to identify factors associated with impaired attentional performance among nurses working in anesthesia and intensive care units in the Rabat–Salé–Kénitra region. Statistical significance was defined as $p < 0.05$. The internal consistency reliability of the measurement scales (Maslach Burnout Inventory and the Perceived Stress Scale) was evaluated using Cronbach's alpha coefficient.

Résultats

Sociodemographic, Professional, and Clinical Characteristics of the Studied Population

The study included 134 nurses working in anesthesia and intensive care units in the Rabat–Salé–Kénitra region. A female predominance was observed, with women representing 68% of participants ($n = 91$) compared to 32% men ($n = 43$). Regarding marital status, 32% of professionals were single ($n = 43$), while the majority were married (60%, $n = 80$), and a smaller proportion were divorced (8%, $n = 11$). The mean age of participants was 35.8 ± 8.01 years, and the average professional experience was 18 ± 3 years. Clinically,

19.7% of nurses had arterial hypertension ($n = 26$), 9% were diabetic ($n = 12$), 25% suffered from respiratory disorders ($n = 34$), and 3% had dermatological conditions ($n = 4$). Regarding quality of life and lifestyle habits, only 20% of participants reported engaging in regular physical activity ($n = 27$), whereas 80% were sedentary ($n = 107$). Smoking affected 13% of nurses ($n = 17$), and caffeine consumption was high, reaching 73% ($n = 98$). In terms of work organization, the average number of on-call shifts was 4 ± 2 per month. The distribution by specialty showed a predominance of work in intensive care (65%, $n = 87$) compared to the operating room (35%, $n = 47$). The number of on-call shifts could reach up to 7 per month in high-activity units (Table 1).

Table 1. Sociodemographic and Professional Profile of the Study Population (N=134)

Variable	Categories	n	%
Sex	Female	91	68%
	Male	43	32%
Marital Status	Single	43	32%
	Married	80	60%
	Divorced	11	8%
Physical Activity	Yes	27	20%
	No	107	80%
Smoking	Yes	17	13%
	No	117	87%
Caffeine Consumption	Yes	98	73%
	No	36	27%
Hypertension	Yes	26	19.7%
	No	108	80.3%
Diabetes	Yes	12	9%
	No	122	91%
Respiratory Disorders	Yes	34	25%
	No	100	75%
Dermatological Conditions	Yes	4	3%
	No	130	97%

Psychometric parameters related to the reliability of measurement instruments

The analysis of the internal consistency of the burnout scale shows satisfactory results. Emotional exhaustion (EE) demonstrates good reliability (Cronbach's $\alpha = 0.87$), while depersonalization (DP) ($\alpha = 0.74$) and personal accomplishment (PA) ($\alpha = 0.76$) exhibit acceptable internal consistency. The overall scale ($\alpha = 0.81$) confirms good reliability of the instrument as a whole. All coefficients exceed the threshold of 0.70, supporting the psychometric quality of the tool (Table 2).

Table 2. Distribution of Cronbach's alpha coefficients across the different dimensions of the Maslach Burnout Inventory

Dimensions	Number of items	Cronbach's α
Emotional Exhaustion (EE)	9	0.87
Depersonalization (DP)	5	0.74
Personal Accomplishment (PA)	8	0.76
Global scale (22 items)	22	0.81

Cronbach's alpha is a measure of internal consistency reliability. A value ≥ 0.70 is generally considered acceptable, ≥ 0.80 good, and ≥ 0.90 excellent.

Regarding the perceived stress scale, the evaluation of internal consistency using the Perceived Stress Scale (PSS-10) yielded a Cronbach's alpha coefficient of 0.81. This value indicates good internal reliability of the instrument within the studied population. These findings suggest that the PSS-10 is a robust psychometric tool for assessing perceived stress among anesthesia and intensive care nurses, ensuring the reliability of the data collected in this study (Table 3).

Table 3. Distribution of Cronbach's alpha coefficients for perceived stress

Scale	Number of items	Cronbach's α
PSS-10 (Global scale)	10	0.81

Cronbach's alpha is a measure of internal consistency reliability. A value ≥ 0.70 is generally considered acceptable, ≥ 0.80 good, and ≥ 0.90 excellent.

Burnout and Perceived Stress Profile in the Studied Population

The descriptive analysis of data collected from nurses working in anesthesia and intensive care units in Morocco highlights a notable exposure to occupational stress as well as to several dimensions of burnout (Table 3).

Table 4. Distribution of perceived stress levels and burnout dimensions among anesthesia and intensive care nurses in Morocco (N = 134)

Variable	Level/Profile	n	%
Emotional Exhaustion (EE)	Low	58	43.3%
	Moderate	12	9.0%
	High	64	47.8%
Depersonalization (DP)	Low	37	27.6%
	Moderate	29	21.6%
	High	68	50.7%
Personal Accomplishment (PA)	Low	37	27.6%
	Moderate	31	23.1%
	High	66	49.3%
Burnout	Low to moderate	98	73.1%
	High	36	26.9%
Perceived Stress	Low to moderate	105	78.4%
	High	29	21.6%

Emotional Exhaustion (EE) : The results indicate that emotional exhaustion is particularly elevated within the sample. Indeed, 47.8% of nurses reported high levels of emotional exhaustion, compared to 43.3% with low levels and only 9% with moderate levels. This suggests substantial emotional strain related to workload and clinical demands. **Depersonalization (DP) :** Findings related to depersonalization also reveal a concerning prevalence. More than half of the participants (50.7%) reported high depersonalization, compared to 27.6% at a low level and 21.6% at a moderate level. This trend suggests that many nurses adopt an emotionally detached attitude toward patients, which may be interpreted as a psychological coping strategy in response to the emotional intensity of their work. However, this dimension of burnout may also impair attentional processes by reducing cognitive engagement and clinical vigilance. **Personal Accomplishment (PA) :** Regarding personal accomplishment, 49.3% of

nurses reported high levels, while 27.6% had low levels and 23.1% moderate levels. This finding indicates that, despite workload and stress, a substantial proportion of participants maintain a sense of competence and professional efficacy. However, more than one-quarter of the sample reported low personal accomplishment, which may reflect decreased motivation, reduced professional self-esteem, and a potential risk of cognitive decline, particularly in executive functions involved in selective attention. The distribution of burnout and perceived stress levels among anesthesia and intensive care nurses showed that the majority of participants reported low to moderate levels. Specifically, 73.1% of nurses had low to moderate burnout, while 26.9% experienced high burnout. Similarly, most participants reported low to moderate perceived stress (78.4%), whereas 21.6% exhibited high stress levels. Despite the predominance of moderate levels, a substantial proportion of nurses still experienced high burnout and stress, reflecting a considerable psychological burden in high-intensity clinical settings such as anesthesia and intensive care units (Table 4). Overall, these findings indicate that although the majority of participants fall within the low to moderate range for both burnout and perceived stress, a substantial proportion of nurses remains exposed to high levels of psychological strain. Importantly, the comparison between the different categories of perceived stress and burnout reveals a highly significant difference between modalities ($p < 0.001$). This suggests that the distribution of stress and burnout levels is not random and reflects meaningful variations within the studied population. These results highlight the coexistence of moderate global profiles with a non-negligible subgroup at high risk, which may have important implications for cognitive functioning, particularly attentional performance, in high-demand clinical settings such as anesthesia and intensive care.

1. Distribution of attentional profiles within the studied population

The analysis of attentional profiles assessed by the D2R test shows a heterogeneous distribution within the study population ($n = 134$). The majority of participants, 80 nurses (59.7%), exhibit an attentive and concentrated profile, reflecting good sustained attention and cognitive control. The binomial test indicates that this proportion is significantly different from 0.5 ($p = .030$), suggesting that this profile is statistically more represented than expected under the null hypothesis. In contrast, 42

participants (31.3%) fall into the neither attentive nor concentrated profile, indicating notable attentional difficulties. This proportion is also significantly different from 0.5 ($p < .001$), confirming that this category is significantly less frequent than an equal distribution but still clinically relevant. Similarly, the impulsive profile is observed in 12 nurses (9.0%), representing the smallest group. The binomial test shows a highly significant difference ($p < .001$) compared to the reference proportion of 0.5, indicating that impulsivity is relatively rare in this sample (Figure 2).

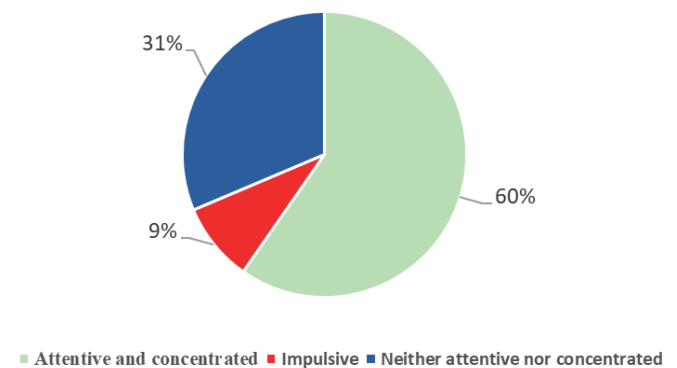


Figure 2. Distribution of attentional profiles within the study population

Impact of Pathological Burnout and Stress on Attention and Impulsivity

The bivariate analysis examining the associations between burnout, perceived stress, and attentional performance revealed statistically significant relationships. Nurses in anesthesia and intensive care with pathological burnout were significantly more likely to exhibit an impaired attentional profile (“not attentive / not concentrated (impulsive)”) compared to those without burnout (72.2% vs. 22.4%). This association was highly significant ($\chi^2(1) = 28.4$, $p < 0.001$), with an Odds Ratio (OR) of 9.03 (95% CI: 3.78–21.6), indicating that nurses with burnout had approximately nine times higher odds of attentional impairment. Similarly, pathological perceived stress was significantly associated with reduced attentional performance. A higher proportion of nurses with stress exhibited an impaired attentional profile compared to those without stress (58.6% vs. 29.5%). This association was statistically significant ($\chi^2(1) = 8.37$, $p = 0.004$), with an Odds Ratio of 3.39 (95% CI: 1.45–7.92), suggesting that stressed nurses had more than three times higher odds of attentional difficulties. Overall,

both burnout and perceived stress were significantly associated with attentional impairment, with burnout showing a stronger effect size than perceived stress (Table 5).

Table 5. Association between burnout, perceived stress, and attentional profile

Burnout status	Not attentive / Not concentrated (impulsive) n (%)	Attentive & concentrated n (%)	Total n (%)	χ^2 (df)	p-value	OR (95% CI)
Pathological burnout	26 (72.2%)	10 (27.8%)	36 (26.9%)	28.4	<0.001***	9.03 (3.78–21.6)
No pathological burnout	22 (22.4%)	76 (77.6%)	98 (73.1%)			
Total	48 (35.8%)	86 (64.2%)	134 (100%)			
Pathological stress	17 (58.6%)	12 (41.4%)	29 (21.6%)	8.37	0.004***	3.39 (1.45–7.92)
No stress	31 (29.5%)	74 (70.5%)	105 (78.4%)			
Total	48 (35.8%)	86 (64.2%)	134 (100%)			

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Perceived Stress and Burnout as Predictors of Attentional Functioning Among Anesthesia and Critical Care Nurses: A Binary Logistic Regression Model

A binomial logistic regression was performed to identify the factors associated with membership in the adaptive attentional profile (Profile 1: attentive and concentrated) versus the dysfunctional profile (Profile 0: not attentive

and concentrated, impulsive). The resulting model showed an excellent overall fit (McFadden's $R^2 = 0.727$), indicating strong explanatory power of the included variables. Classification performance was also high, with a sensitivity of 0.977 and a specificity of 0.826, suggesting that the model effectively discriminates between individuals belonging to the two profiles.

Table 6. Binomial Logistic Regression Predicting Attentional Profile (n=134)

Predictors	β (SE)	Z	p	OR	95% CI for OR
Intercept	-23.796 (8.541)	-2.786	.005	4.63e-11	[2.47e-18 ; 8.63e-04]
Perceived stress	1.212 (1.487)	0.815	.415	3.36	[0.18 ; 61.97]
Dermatological conditions	6.117 (2.459)	2.488	.013*	453.60	[3.66 ; 56,255.6]
Respiratory disorders	-4.447 (2.444)	-1.819	.069†	0.012	[0.0001 ; 1.41]
Age	0.393 (0.166)	2.369	.018*	1.48	[1.07 ; 2.05]
Burnout – Emotional Exhaustion (EE)	-4.285 (2.492)	-1.720	.085†	0.014	[0.0001 ; 1.82]
Global burnout	6.092 (2.541)	2.397	.017*	442.09	[3.04 ; 64,513.4]
Grade	1.278 (0.571)	2.238	.025*	3.59	[1.17 ; 10.99]
Burnout – Depersonalization (DP)	3.937 (2.364)	1.665	.096†	51.26	[0.50 ; 5,289.6]
AP score	1.220 (1.052)	1.160	.246	3.39	[0.43 ; 26.62]

Note. β = logit coefficient; SE = standard error; OR = odds ratio; CI = 95% confidence interval. $p < .05$. † $p < .10$. Note. The model shows excellent discriminative performance and a high level of overall fit.

In this study conducted among nurses working in anesthesia and critical care units, a binomial logistic regression was performed to identify factors associated with membership in an adaptive attentional profile (Profile 1: attentive and focused) versus a dysfunctional attentional profile (Profile 0: impulsive, non-attentive). The results indicate that age is a significant predictor of attentional profile. Specifically, increasing age is associated with a higher likelihood of belonging to the adaptive attentional profile ($\beta = 0.393$, $p = .018$; OR = 1.48), meaning that each additional year of age increases the odds of being attentive and focused by approximately 48%. Similarly, professional grade emerged as a significant determinant. Higher grade levels increase the probability of belonging to the adaptive attentional profile by roughly 3.6 times ($\beta = 1.278$, $p = .025$; OR = 3.59). This finding suggests that professional advancement, likely associated with greater clinical experience and more developed cognitive regulation strategies, may support more stable attentional functioning in high-pressure care environments. Regarding clinical variables, the presence of dermatological conditions was significantly associated with an increased probability of belonging to the adaptive attentional profile ($\beta = 6.117$, $p = .013$; OR = 453.6). However, the very high odds ratio and wide confidence interval indicate potential coefficient instability, likely due to the low frequency of these conditions in the sample or a quasi-complete separation effect. Concerning burnout, global burnout showed a significant effect, strongly increasing the probability of belonging to the adaptive attentional profile ($\beta = 6.092$, $p = .017$; OR = 442.1). Although this result may seem counterintuitive given that burnout is typically associated with reduced attentional resources it may reflect specific dynamics among anesthesia and critical care nurses. In such high-stakes environments, some professionals may maintain high attention levels despite burnout through hypervigilance, overcommitment, or compensatory cognitive mechanisms. Nonetheless, this positive association might also reflect a methodological artifact, such as collinearity between burnout dimensions or variable coding issues. By contrast, perceived stress did not significantly predict attentional profile membership ($\beta = 1.212$, $p = .415$), suggesting that subjective stress alone does not directly differentiate between impulsive and attentive profiles in this model. Similarly, the specific dimensions of burnout, emotional exhaustion (EE) and depersonalization (DP),

were not statistically significant, though their effects approached the threshold ($p = .085$ for EE; $p = .096$ for DP), indicating a potential influence that might be clarified with larger samples. Finally, respiratory disorders tended to decrease the likelihood of belonging to the adaptive attentional profile ($\beta = -4.447$, $p = .069$; OR = 0.012), possibly reflecting the impact of physiological limitations and fatigue on attentional capacity. However, this effect is marginal and should be interpreted with caution. It is also important to note that the model exhibited singular fit, indicating that some coefficients could not be optimally estimated. This issue is commonly related to high multicollinearity among predictors or imbalanced variable distributions, which may lead to unstable estimates and extremely high odds ratios for certain variables (Table 6).

DISCUSSION

Occupational stress and burnout are now considered major factors that may trigger a wide range of neurocognitive disturbances¹⁹, a finding that was confirmed by the results of our study. Indeed, the bivariate analysis examining the relationships between burnout, perceived stress, and attentional performance revealed statistically significant associations. Our findings showed that anesthesia and intensive care nurses with pathological burnout were far more likely to present an impaired attentional profile (72.2% vs. 22.4%), with a highly significant association ($p < 0.001$) and an approximately ninefold increased risk (OR = 9.03). Similarly, pathological perceived stress was associated with decreased attentional performance (58.6% vs. 29.5), with a significant association ($p = 0.004$) and an approximately threefold increased risk (OR = 3.39). Overall, burnout and perceived stress were strongly associated with attentional impairment, with a greater effect observed for burnout.

These findings are consistent with the scientific literature, which highlights that burnout is frequently associated with cognitive disorders, particularly deficits in executive functions, attention, and memory²⁰. Executive functions represent a central cognitive domain involved in planning, behavioral regulation, decision-making, and adaptation to environmental demands^{21,22}. In this regard, van der Linden et al.²³ reported that burnout is associated with reduced performance in sustained attention and inhibition tasks, two fundamental components of executive control.

Another essential dimension of executive functioning is cognitive flexibility, defined as the ability to shift between tasks or cognitive strategies²⁴. Likewise, several studies have shown that occupational burnout is negatively correlated with cognitive performance across various professional settings. Among teachers, for instance, burnout has been associated with reduced cognitive performance, suggesting that executive control deficits may underlie these impairments²⁵. Other researchers have also demonstrated that individuals diagnosed with stress-related burnout exhibit poorer performance than healthy employees in cognitive tasks requiring sustained attention and visuospatial abilities²⁶. Finally, Jonsdottir et al.²⁷ reported significant cognitive disturbances in individuals suffering from occupational burnout, further supporting the hypothesis that chronic stress and burnout may lead to long-lasting impairment of cognitive resources.

These results can be interpreted in light of the neurobiological model of stress, which explains how prolonged exposure to occupational stress can negatively affect cognitive performance. Chronic stress leads to persistent activation of the hypothalamic–pituitary–adrenal (HPA) axis, resulting in excessive secretion of glucocorticoids, particularly cortisol, which disrupts brain adaptive mechanisms. This neuroendocrine dysregulation may induce functional and structural alterations in key brain regions involved in attention and executive control, such as the prefrontal cortex, hippocampus, and amygdala. These alterations, combined with neuroinflammation and neurotransmitter imbalances, may explain the reduced attentional capacities observed among nurses suffering from burnout or high perceived stress. Therefore, our findings support the hypothesis that occupational stress and chronic exhaustion are not limited to emotional consequences, but are also associated with measurable neurocognitive impairments that may compromise vigilance, concentration, and decision-making quality in a highly demanding clinical context²⁸.

In this perspective, the neurobiological model of stress and its impact on attention is based on a dynamic shift between two brain systems: bottom-up control, oriented toward sensory vigilance and rapid detection of salient signals, and top-down control²⁹, which depends on the prefrontal cortex and is involved in the voluntary regulation of attention and executive functions. Under stress, this balance shifts toward

survival-related circuits, particularly amygdala-based pathways, at the expense of prefrontal mechanisms responsible for goal-directed and focused attention. This reorientation is further reinforced by activation of the noradrenergic system (LC-NE), in which excessive norepinephrine release disrupts prefrontal cortex functioning, promoting impulsive responses rather than elaborated cognitive processing. Moreover, prolonged activation of the HPA axis³⁰ leads to increased cortisol secretion, which may alter prefrontal functional connectivity and reduce the attentional resources available for complex tasks. Additional mechanisms, such as disruptions in the cholinergic system, may also contribute to impaired sustained attention, particularly through reduced acetylcholine availability. These neurobiological disturbances are reflected in measurable electrophysiological markers, such as an increase in the N1/N1pc component indicating greater attentional capture by distracting stimuli, and a reduction in P3 (P3a/P3b) amplitude³¹⁻³², reflecting weakened voluntary attentional control and reduced processing of relevant stimuli. Overall, this model provides a solid mechanistic explanation for the attentional deficits observed in professionals exposed to chronic stress and burnout.

Regarding burnout prevalence, the present study conducted among anesthesia and intensive care nurses showed that 26.9% of participants presented high burnout and 21.6% reported high perceived stress. These findings are broadly consistent with the international literature, which reports high burnout rates ranging from 20% to 40% in critical care units. At the national level, our results are also in line with the study conducted in Morocco by Soufiane Benhamza et al. (2023)³³, who reported particularly high burnout levels among anesthesia and intensive care professionals. The authors observed that 48% of participants exhibited high emotional exhaustion, 43.2% reported significant depersonalization, and 21% showed low personal accomplishment. Comparatively, our study also found high levels of emotional exhaustion (47.8%) and depersonalization (50.7%), confirming the high exposure of Moroccan critical care professionals to burnout. However, the proportion of participants with high overall burnout (26.9%) in our study appears slightly lower than that suggested by the individual dimensions reported by Benhamza et al., which may be explained by methodological differences, sample characteristics, or assessment tools. These converging findings reinforce the idea that working conditions in

anesthesia and intensive care departments in Morocco characterized by heavy workload, high emotional pressure, and organizational constraints represent major risk factors for burnout.

Indeed, the issue of the psychological and organizational impacts of the COVID-19 pandemic has been widely documented by several scientific studies. In this regard, the study by Demir Doğan M., Sayılan A.A., and Sayılan S. (2023)³⁴ examined the relationship between nurses' levels of anxiety and depression and their adherence to isolation measures during the pandemic. The findings revealed higher levels of stress, anxiety, and depression among healthcare professionals caring for COVID-19 patients compared to those not involved in their care, as well as a significant positive correlation between compliance with isolation measures and these psychological indicators, suggesting a substantial emotional impact associated with sanitary constraints.

Furthermore, another study entitled "The response to COVID-19 across countries and the implications for future pandemics" highlights the disparities in national responses to the health crisis, emphasizing the importance of management strategies, healthcare system coordination, and public policies in mitigating the effects of the pandemic. This study also stresses the lessons to be learned in order to better prepare for and respond to future pandemics, particularly in terms of healthcare system resilience and the adaptation of prevention and care strategies (35).

CONCLUSION

This study highlights a significant impact of perceived stress and burnout on the attentional capacities of anesthesia and intensive care nurses. The results indicate that professionals with pathological burnout had a markedly higher risk of developing an impaired attentional profile, characterized by reduced concentration and increased impulsivity. Similarly,

high perceived stress was associated with a significant decrease in attentional performance, although the effect was less pronounced than that of burnout.

These findings confirm that chronic stress and occupational exhaustion are not limited to emotional consequences, but are also accompanied by measurable neurocognitive disturbances that may affect vigilance, decision-making quality, and patient safety in a highly demanding clinical setting. Therefore, preventing burnout and reducing occupational stress should be considered essential priorities in order to preserve nurses' cognitive functioning and ensure better quality of care in intensive care environments.

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Conflict of Interest: NON

Ethical clearance:

The study was conducted in accordance with ethical standards. Ethical approval was obtained from the appropriate institutional review board/ethics committee prior to data collection. All participants provided informed consent, and confidentiality and anonymity were ensured throughout the study.

Authors' contribution:

- **Idea owner of the study and data gathering:** S.N, Y.R, Z.A
- **Study design:** S.N, H.K, Y.R
- **Data gathering:** S.N, S.A, O.T.A
- **Writing and submitting manuscript:** R.M, Y.R, Z.A
- **Editing and approval of the final draft:** A.R, H.Eli, H.K

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