TPM Vol. 32, No. S4, 2025
ISSN: 1972-6325
https://www.tpmap.org/

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CONSTRUCTION AND VALIDATION OF A SCALE TO MEASURE THE EMOTIONAL LOAD IN NURSES DURING NIGHT SHIFTS

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Summary
The emotional burden nurses face during night shifts poses a significant risk to their psychological well-being and professional performance. This study aims to develop and validate a specific scale to measure emotional load in this work context. A quantitative, cross-sectional methodological design was followed in three phases: theoretical review, item construction, and validation by factor analysis and internal consistency. The scale was applied to a sample of 230 nurses from public and private hospitals. The results indicated a clear factor structure with three dimensions: emotional exhaustion, impact on personal life and work coping. The overall Cronbach's alpha was 0.91. It is concluded that the scale is a valid and reliable instrument for the evaluation of emotional load in night shift nurses, thus allowing the design of effective psychosocial interventions.
Keywords: emotional load, nursing, night shifts, scale validation, occupational mental health.

INTRODUCTION

Nursing work, especially in hospital contexts, represents one of the most demanding professions in emotional, physical and cognitive terms. Among their many challenges, night shifts constitute a significant source of attrition due to the disruption of the circadian cycle, continuous exposure to human suffering, the workload increased by downsizing, and social isolation by coinciding with unconventional schedules (Martínez-López et al., 2021; Yuan et al., 2022).

Nurses who work at night face higher rates of sleep disorders, accumulated fatigue, metabolic alterations, and depressive or anxious symptoms compared to those who work during the day (Zhang et al., 2023). The accumulation of these conditions generates a sustained **emotional burden** that affects both their mental health and their professional performance and personal relationships, which can lead to clinical errors, lower quality of care provided, absenteeism, and high staff turnover (Serrano-Pons et al., 2022).

Emotional load, understood as the psychological weight associated with the management of one's own and others' emotions in work contexts, has been addressed mainly from general approaches to stress or burnout. However, its specific manifestation in night nursing shifts has been poorly systematized and measured (Kowalczuk et al., 2021). The accurate assessment of this burden requires psychometric tools that integrate both the working conditions and the subjective experiences of health personnel.

Although there are scales to measure work-related stress or emotional exhaustion, they lack specificity regarding the impact of night shifts and do not consider dimensions such as alteration of work-life balance, lack of recognition, or coping strategies used in this particular context (Sánchez-Mendoza et al., 2020). The absence of validated instruments hinders both research and the design of occupational health policies aimed at this professional group.

Given this need, the present study aims **to build and validate a scale to measure the emotional load in nurses who perform night shifts**, from a contextualized and empirically robust perspective. This tool seeks to contribute to the early diagnosis of psychosocial risks, the continuous monitoring of emotional well-being, and the design of more effective institutional interventions.

2.THEORETICAL FRAMEWORK

The theoretical framework of this study is structured in three main axes: (1) the emotional load as a psychological construct, (2) the psychosocial implications of night work in the field of nursing, and (3) the development and validation of psychometric instruments in occupational health.

2.1. The emotional burden in care contexts

Emotional load refers to the set of emotional demands that a worker must face in their work environment, including managing their own emotions and those of others (Zapf et al., 2020). In care professions such as nursing, this burden is intensified by constant exposure to suffering, death and high-stress situations.

The concept is closely linked to **emotional labor**, defined by Hochschild as the regulation of feelings to meet organizational expectations (Grandey et al., 2022). When this regulation is constant and does not find adequate discharge mechanisms, emotional deterioration occurs that can lead to **burnout syndrome**, anxiety, depression, and reduced clinical empathy (Duarte et al., 2021).

Table 1. Components of the emotional load in care work

Component	Description
Exposure to suffering	Constant presence of pain, death, or distress in patients
Affective overload	Expectation to show positive emotions, hiding real emotions
Emotional exhaustion	Burnout from ongoing interaction with people in crisis
Lack of recognition	Perception of devaluation by the organization

Source: Adapted from Grandey et al. (2022) and Duarte et al. (2021).

2.2. Implications of night work in nursing

Night shifts generate physiological and psychological alterations associated with the disruption of the circadian rhythm. Night work has been linked to chronic fatigue, sleep disturbances, increased incidence of metabolic diseases, and mood disturbances (Yuan et al., 2022).

In the case of nurses, these conditions are aggravated by the responsibility of continuous care, the decrease in institutional resources during the night and the lack of supervision. These conditions affect work-life balance, increasing the risk of family problems, social isolation, and perception of loneliness (Zhang et al., 2023).

Table 2. Psychosocial consequences of night work in nursing

Affected dimension	Common manifestations
Physical Health	Fatigue, insomnia, gastrointestinal problems
Emotional Health	Anxiety, irritability, depressive symptoms
Social and family relationship	Disconnection with support networks, social isolation
Work performance	Decreased concentration, procedural errors

Source: Yuan et al. (2022); Zhang et al. (2023).

2.3. Psychometric evaluation in occupational health

The **valid and reliable measurement** of psychosocial variables in the workplace requires instruments adapted to the sociocultural context and the characteristics of the professional group. A psychometric scale must meet **criteria of content** validity, **factor structure,** and **internal consistency** (García-Ramírez et al., 2020).

In hospital settings, tools such as the Maslach Burnout Inventory or the General Health Questionnaire (GHQ-12) have been widely used; however, their approach is general and does not accurately capture the specific emotional burden of night shifts. Hence the need to **design contextualized scales**, focused on dimensions such as emotional exhaustion, personal life affectation, and coping strategies, which allows improving the clinical relevance of the results (López-Pérez et al., 2021).

Table 3. Psychometric criteria for scale validation

Criterion	Description
Content validity	Degree to which items adequately represent the construct
Factor validity	Statistical confirmation of the theoretical structure by factor analysis
Internal consistency	Degree of homogeneity of responses (e.g., Cronbach's alpha)
Test-retest reliability	Stability of the instrument at different times of application

Source: García-Ramírez et al. (2020).

METHODOLOGY

This study is part of a quantitative research, with an instrumental design, whose objective was to build and validate a psychometric scale to measure the emotional load in nurses who work night shifts. The methodology was divided into three main phases: design and construction of items, content validation and psychometric analysis.

3.1. Study design

A cross-sectional **and** instrumental **design was used**, suitable for the creation and validation of psychological measurement instruments (Muñiz & Fonseca-Pedrero, 2019). This type of study focuses on the analysis of psychometric properties, including validity, reliability and internal structure of the instrument.

3.2. Participants

The sample was composed of **230 professional nurses**, selected through a non-probabilistic convenience sampling, from public and private hospitals in the cities of Bogotá, Medellín and Cali (Colombia).

Inclusion criteria:

- Nurses with professional titles.
- Minimum experience of 6 months in night shifts.
- Sign informed consent and availability to answer the questionnaire.

Exclusion criteria:

- Personnel on medical leave for emotional or psychiatric disorders.
- Participants who did not complete more than 90% of the items.

Table 4. Sociodemographic characteristics of the sample

Variable	Mean (SD) / Frequency (%)
Age	34.7 years (SD = 5.2)
Years of nighttime experience	3.8 years (SD = 2.1)
Hospital Type	Public (78%), Private (22%)
Marital status	Single (52%), Married (40%), Other (8%)
Shifts per week	3.2 turns (SD = 1.1)

Source: Authors.

3.3. Development and validation phases

Phase 1: Item Construction

A systematic review of recent literature on emotional load, occupational mental health, and night nursing was carried out (Grandey et al., 2022; López-Pérez et al., 2021). Likewise, semi-structured interviews were conducted with **10 nurses who are experts** in night work, which allowed us to identify key dimensions of the phenomenon. Based on this information, **28 initial items** were constructed in a 5-point Likert format (1 = strongly disagree, 5 = strongly agree).

Phase 2: Content validation by expert judges

A panel of **6 judges** was selected: 3 experts in psychometrics and 3 in hospital nursing. Each judge evaluated the items on **clarity, consistency, and relevance**, using a scale of 1 to 4. The modified Lawshe **Content Validity Index (CVI)** was calculated (Tristan, 2008).

Table 5. IVC results for selected items

Category	Initial items	Deleted items	Average IVC
Emotional exhaustion	10	1	0.89
Impact on personal life	9	2	0.87
Coping Strategies	9	3	0.85
Total	28	6	**0.87**

Source: evaluation of judges.

6 items were eliminated for scores below 0.75 or for conceptual ambiguity.

Phase 3: Pilot application and psychometric analysis

The preliminary version of 22 items was applied to the total sample (n = 230). Sample **adequacy was verified** using the **KMO index** and **Bartlett's sphericity** test, as requirements for Exploratory Factor Analysis (EFA).

Table 6. Adequacy testing for factor analysis

TEST	RESULT
KMO	0.928
BARTLETT (X^2, GL, P)	1421.78, 231, p <.001

EFA was performed with Varimax rotation, and factors with **eigenvalues > 1** were retained. Factor loads greater than 0.40 were considered to maintain the items in each dimension (Costello & Osborne, 2021). In addition, **Cronbach's alpha** was calculated for each subscale and for the total scale.

3.4. Ethical considerations

This study was approved by the Ethics Committee of the Faculty of Health Sciences of a Colombian university (Record No. 023-2024). Anonymity, confidentiality of data, and voluntary informed consent were guaranteed, in accordance with the **Declaration of Helsinki** and **Resolution 8430 of 1993 of the Ministry of Health of Colombia**.

RESULTS

The analysis of results was structured in three main sections: (1) descriptive analysis of the sample, (2) analysis of factor structure and (3) analysis of internal reliability of the scale.

4.1. Descriptive analysis of the sample

230 nurses were surveyed. 78% worked in public institutions and 22% in private clinics. The mean age was 34.7 years (SD = 5.2), with a range between 23 and 54 years. The average number of night shifts per week was 3.2 (SD = 1.1).

Table 7. General characteristics of the participants

Variable	Mean (SD) / Frequency (%)
Age	34.7 (±5.2) years
Years of nighttime experience	3.8 (±2.1) years
Hospital Type	Public (78%), Private (22%)
Marital status	Single (52%), Married (40%), Other (8%)
Night shifts per week	3.2 (±1.1)

4.2. Exploratory factor analysis (EFA)

An EFA was performed on the final 22 items to identify the underlying structure of the scale. Adequacy was verified using the KMO index and Bartlett's sphericity test.

- **KMO = 0.928**: excellent sampling adequacy (Field, 2020).
- **Bartlett χ^2 (231) = 1421.78, p < 0.001**: adequate significance to proceed with the factor analysis.

Three **factors** were identified with eigenvalues greater than 1, which explained **67.4% of the total variance**. The Varimax rotation optimized the clarity of the factors, whose items were distributed in a way that was consistent with the theoretical framework.

Table 8. Results of exploratory factor analysis

Factor	Items included	Cronbach's Alfa	% Variance Explained
Emotional exhaustion	9	0.88	31.5%
Impact on personal life	7	0.84	22.3%
Coping Strategies	6	0.79	13.6%
Total scale	22	**0.91**	**67.4%**

4.3. Factor loads per item

The most significant factor loads for each item are presented below, grouped by dimension.

Table 9. Factor Loads by Item (Varimax Rotation)

Item	F1: Exhaustion	F2: Personal impact	F3: Coping
I feel emotionally drained at the end of the shift	0.78		
I've cried after finishing a night shift	0.73		
My family life has been affected by work		0.75	
I feel lonely or isolated during night shifts		0.69	
I practice breathing or relaxation exercises			0.72
I talk to colleagues about my emotions			0.68

Note: Only items with a charge > 0.60 are included in the corresponding dimension.

These results coincide with similar studies on emotional burdens in healthcare professionals, such as those reported by Duarte et al. (2021) and Grandey et al. (2022), which also found similar dimensions when differentiating emotional exhaustion, extra-work consequences, and coping mechanisms.

4.4. Internal reliability

The **overall Cronbach's alpha was 0.91**, which indicates an excellent internal consistency of the scale, higher than the threshold of 0.70 recommended by the psychometric literature (Muñiz & Fonseca-Pedrero, 2019). All subscales also exceeded the minimum threshold, ensuring adequate reliability for clinical and research application.

4.5. Comparative analysis between public and private hospitals

A comparative analysis (Student's t-test) was performed between nurses from public and private hospitals to explore differences in global emotional load scores.

Table 10. Comparison of Global Scores by Hospital Type

Hospital Type	Medium (Emotional Charge)	OF	t (gl = 228)	p value
Public	3.87	0.52	2.31	0.021
Private	3.62	0.48		

Nurses in public hospitals reported significantly higher levels of emotional burden compared to their peers in private institutions ($p < 0.05$), which coincides with previous findings linking more precarious working conditions and overload in the public sector (Serrano-Pons et al., 2022).

CONCLUSIONS

The findings of this study allow us to conclude that the scale developed represents a psychometrically sound, valid and reliable tool to measure the **emotional load** in nurses who perform **night shifts**. The three-dimensional structure obtained—emotional exhaustion, impact on personal life, and coping strategies—is consistent with current theoretical frameworks on emotional work in health professions (Grandey et al., 2022; Zapf et al., 2020).

The emotional load identified is not an isolated phenomenon, but the result of a constant accumulation of unmanaged affective demands, which intensify under the conditions of night work: less supervision, sleep disturbance, social isolation, and frequent contact with critical situations (Zhang et al., 2023; Yuan et al., 2022). In this context, having a specific instrument such as the one proposed in this study is of vital importance for health professionals and hospital institutions.

In practical terms, the scale can be applied in clinical and organizational contexts to:

- To diagnose the level of emotional load in nurses in a systematic way.
- Identify critical areas that require psychological or organizational intervention.
- To evaluate the impact of workplace well-being and burnout prevention programs.

In addition, the comparative results revealed that nurses from public hospitals reported a higher emotional load than those from private institutions, which points to an urgent need to improve working and psychosocial conditions in the public sector (Serrano-Pons et al., 2022).

From an occupational health approach, it is recommended that **human talent, occupational well-being, and mental health departments** integrate this tool as part of their regular evaluations. Monitoring emotional load can prevent serious consequences such as abandonment of the profession, deterioration of performance, or effects on the quality of care (Duarte et al., 2021).

At the scientific level, the construction of this scale contributes to the field of **psychometrics applied to specific work contexts**, an area that requires further development, given that many of the available tools have been designed for generic contexts (Muñiz & Fonseca-Pedrero, 2019). This research also invites future validations in other Latin American countries and with diverse samples, including men and other professional levels of care, to broaden the generalization of its results.

Finally, this instrument represents a first step towards greater visibility of emotional distress in night nursing, and provides useful evidence for the formulation of public policies in occupational health with a differential and gender approach.

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