

ORIGINAL ARTICLE

Work-related stress levels among nurses in Organ Procurement Organizations

HIGHLIGHTS

1. Half of the sample shows greater vulnerability to occupational stress.
2. Working in organ procurement organizations requires complex technical and emotional skills.
3. Social support and autonomy reduce the effects of occupational stress.
4. Institutional policies are essential for preserving mental health.

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ABSTRACT

Objective: To assess levels of occupational stress among nurses working in Organ Procurement Organizations in Brazil. **Method:** A cross-sectional, quantitative study with data collected between March and May 2025 via an electronic platform using the Job Stress Scale, which includes the dimensions of psychological demand, control over work, and social support. Analysis used descriptive statistics, with scores dichotomized and categorized into four quadrants: high burnout, passive work, active work, and low burnout. Associations with social support, years of training, and age were examined. **Results:** Forty-eight nurses participated; 15 (31%) were categorized as low burnout, 13 (27%) as active work, 11 (23%) as high burnout, and nine (19%) as passive work. Low social support was observed among the most vulnerable groups. **Conclusion:** Despite their autonomy and technical competence, nurses are exposed to unfavorable psychosocial conditions, indicating a need for institutional strategies that balance demands and control, valuing social support as a protective factor for mental health and essential to the success of organ donation.

DESCRIPTORS: Nursing; Occupational Health; Burnout, Professional; Stress, Physiological; Tissue and Organ Procurement.

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INTRODUCTION

Organ Procurement Organizations (OPOs) are units within the National Transplant System responsible for identifying potential donors, assessing organ viability, and coordinating the entire procurement process. These institutions serve as a link between reporting hospitals, donors' families, and transplant centers, ensuring that the process is conducted ethically, in an organized manner, and in compliance with current legislation. The work of OPOs is governed by Law No. 9,434, of February 1997¹, updated by Decree No. 9,175 of 2017² which establishes guidelines for organ procurement and transplantation in the country¹.

In 2023, according to data from the Brazilian Association of Organ Transplantation (ABTO), Brazil had 61 active OPOs distributed across different regions, with the goal of expanding access to and the effectiveness of organ donation nationwide.³ By 2024, according to the most recent data from the Brazilian Transplant Registry (RBT), the number of active OPOs nationwide had increased to 63, demonstrating a continuous effort to strengthen the organ procurement and distribution network.⁴

According to Ordinance No. 2,600, dated October 21, 2009, which establishes the Technical Regulations of the National Transplant System, OPOs must have a coordinating physician and nurses trained in specific areas such as the diagnosis of brain death, clinical screening of potential donors, and conducting interviews with family members.⁵ Within this structure, nurses play a strategic role in the operation of the OPO, working on everything from coordinating with reporting units to organizing all the logistics of organ procurement. Furthermore, it is the responsibility of this professional to provide comfort and emotional support to families during moments of great vulnerability, which requires not only technical skills but also communication and interpersonal skills. This wide range of responsibilities can lead to a high level of emotional and physical overload, contributing to increased occupational stress among nurses working in this specific context.⁶

The work environment in emergency care units imposes an intense routine on nurses, marked by high emotional demands, urgent decisions, and a high degree of responsibility. These conditions foster the development of occupational stress, which compromises not only the professionals' emotional well-being but also their decision-making ability and the quality of care provided. The lack of effective institutional support, combined with an overload of duties and a shortage of professional recognition, tends to intensify this scenario.⁷ In the context of OPOs, the impact of stress can negatively affect the reception of potential donors' families and the effective management of donor recruitment processes. Thus, the lack of organizational strategies focused on caring for healthcare professionals can contribute to dissatisfaction and the progressive burnout of nurses, with direct consequences for team performance.⁸

The importance of investigating occupational stress among nurses in OPO is directly linked to the efficiency and continuity of the organ procurement process. Studies show that the emotional and technical overload faced by these professionals can compromise their mental health and, consequently, affect the quality of care provided.⁷ Situations of intense stress can contribute to reduced engagement, increased errors, absenteeism, and turnover - factors that negatively impact a service requiring technical expertise and sensitivity toward grieving families. Furthermore, frequent absences and the replacement of staff members require additional training and weaken the relationship of trust between the teams and the donors' families.⁹

Measuring the stress levels of these nurses is essential for proposing interventions that promote not only the well-being of the staff but also the improvement of processes at organ procurement organizations (OPOs). Valued professionals with institutional support demonstrate greater resilience in the face of the emotional and operational demands of the service.¹⁰ Proper stress management, therefore, is a strategic tool that

contributes to motivation, job satisfaction, and the prevention of emotional burnout, with a direct impact on the effectiveness of organ procurement. Thus, understanding the factors that influence stress in OPO staff is a fundamental step toward developing organizational strategies that promote healthier work environments and strengthen the performance of the country's transplant system.¹¹

Previous studies have shown that professionals involved in the organ donation and transplantation process are exposed to high levels of occupational stress, often associated with emotional overload, the complexity of clinical decisions, and the ethical responsibility inherent in the process. In addition, factors such as communicating with bereaved family members, the need for swift decision-making, and coordination among different teams contribute to increased psychological demands on these professionals. Despite this, there is a scarcity of research specifically focused on nurses working in Organ Procurement Organizations (OPOs), whose duties involve unique aspects that may intensify their exposure to stressors. In this context, it is important to deepen our understanding of occupational stress among this professional group, thereby contributing to the development of institutional strategies better tailored to the reality of OPOs.⁷

Thus, this study aims to assess levels of occupational stress among nurses working in Organ Procurement Organizations in Brazil.

METHOD

This is a cross-sectional study with a quantitative approach that used the validated *Job Stress Scale* (JSS)¹² to assess levels of occupational stress among nurses working in OPOs in Brazil. Data were collected between March and May 2025 using the *Research Electronic Data Capture* (REDCap) platform.

The study population consists of nurses currently working in Brazilian OPOs. According to the 2023 RBT, the year in which the research project began, there were 61 OPOs in operation in the country. As established by Ordinance No. 2,600/2009, each OPO must have at least two nurses, totaling 122 professionals. Based on these data, the sample calculation considered a margin of error of 5% and a confidence level of 95%, resulting in a sample of 82 participants. The study included nurses currently working at active OPOs in Brazil, and forms with incomplete information were excluded. Contact with participants was made through the technical coordinators of the OPOs, using the institutional email address publicly available through the RBT.

For data collection, which took place between March and May 2025, the researchers sent an email to all OPOs explaining the study's objective, methodology, risks, and benefits. This email requested that the link to the survey form hosted on the REDCap platform be forwarded to the nurses working in the service. Each professional who wished to participate in the survey accessed the link and, on the first page, was presented with the Free and Informed Consent Form (RCLE). After consenting to participate in the survey, the professional was directed to the questions.

The JSS instrument, in its shortened version validated for Portuguese, was used.¹² This is a widely used instrument for measuring occupational stress, consisting of 17 items, 11 of which are rated on a frequency scale (often, sometimes, rarely, never, or almost never) and six on an agreement scale (strongly agree, agree more than disagree, disagree more than agree, strongly disagree). The JSS addresses three dimensions of occupational stress: psychological demand (related to workload, pace, and emotional demands), control over work (involving autonomy, task complexity, and repetitiveness), and social support at work (quality of relationships with colleagues and supervisors).

The questionnaire also included sociodemographic information, such as age and years of education.

The data were analyzed using descriptive statistics and the JSS scale analysis method, in which the values for psychological demand and control over work were used to classify participants into the quadrants of the Demand-Control model. To this end, participants' responses to each question were summed, and the average of the responses constituted the score for each dimension.

Based on the score, the data were dichotomized: values below the mean were classified as low psychological demand or low control over work, and those equal to or above the mean as high psychological demand or high control over work. Based on this dichotomization, participants were divided into four categories: passive work (low demand and low control), active work (high demand and high control), low-burnout (low demand and high control), and high-burnout (high demand and low control). Each quadrant represents different conditions of exposure to occupational stress.

The social support dimension was assessed in parallel; using the same method, responses were summed, and the mean represented the score. Based on this score, each response was dichotomized into high emotional support or low emotional support.

Additionally, associations were explored between sociodemographic variables (age and years of training) and the presence of high occupational burnout. For this analysis, the variables age and years since graduation were categorized based on the sample median, and the outcome was dichotomized into the presence or absence of high burnout, considering its relevance as an indicator of greater vulnerability to occupational stress. This approach was adopted to better suit the study's sample size.

All participants were fully informed about the study's objectives, the voluntary nature of participation, and the guarantee of confidentiality of their information. Strict security measures were implemented to protect the data, including anonymization, the removal of personally identifiable information, and secure storage in an encrypted environment on the REDCap platform.

The research was conducted in accordance with Resolution No. 466/2012 and Resolution No. 510/2016, both issued by the National Health Council, and approved by the Research Ethics Committee of the Federal University of São Paulo, under approval number 7.409.283

RESULTS

The sample for this study consisted of 48 professionals. The mean age of the participants was 40.3 years, with values ranging from 23 to 62 years (median of 40, ± 10.6). Regarding the duration of professional training, the mean was 14.9 years (median of 15 years, ± 9.6), indicating that the professionals generally have well-established experience in the field of nursing.

Regarding the dimensions of JSS, the score for items on psychological demand averaged 10.7 points (± 2.6), ranging from 6 to 19 points. For the dimension of control over work, the mean was 14.8 points (± 1.6), with a range of 12 to 18 points. Table 1 presents the psychological demand and control over work dimensions.

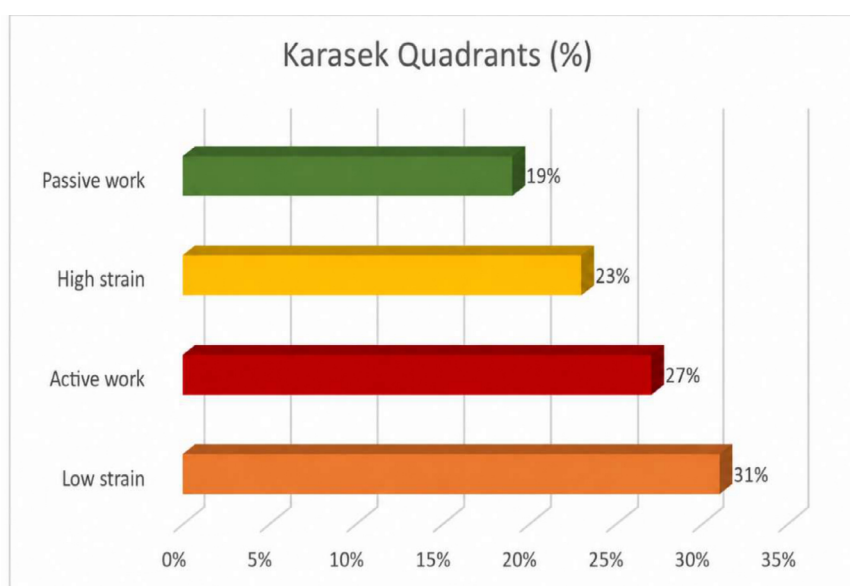
Table 1. Assessment of the psychological demand and job control dimensions and the demand-control quadrants of the JSS. São Paulo, SP, Brazil, 2025

JSS Variables	n	%
Psychological demand		
High demand (↑D)	24	50
Low demand (↓D)	24	50
Control over work		
High control (↑C)	28	58.4
Low control (↓C)	20	41.6
Demand-control quadrants (JSS)		
High stress (↑D ↓C)	11	23
Active work (↑D ↑C)	13	27
Passive work (↓D ↓C)	9	19
Low wear (↓D ↑C)	15	31

Legend: (N=48)

Source: The authors (2025).

Figure 1 presents the four demand-control categories (quadrants) obtained by dichotomizing the score values. Values below the mean were classified as low psychological demand or low control over work, and those equal to or above the mean as high psychological demand or high control over work.

**Figure 1.** Demand-control categories (Karasek quadrants) derived from the dichotomization of scores based on nurses' responses to the JSS. São Paulo, SP, Brazil, 2025

Source: The authors (2025).

Data analysis allowed for the classification of nurses into four distinct profiles, based on cutoff points established by the mean score for each dimension of the scale: high burnout, low burnout, active work, and passive work. This stratification revealed

that 15 (31%) participants were classified in the low burnout quadrant, indicating lower exposure to potentially stressful factors and a perception of a more balanced environment, while 13 (27%) nurses reported conditions consistent with active work, characterized by the coexistence of high demand and high control over the activities performed; 11 (23%) participants were in the high-strain situation, a profile of greater vulnerability to occupational stress. Finally, the passive work category included 9 (19%) nurses, highlighting a significant proportion of professionals with lower demand intensity but limited autonomy, which may imply progressive negative effects on motivation and learning.

In the social support dimension, a mean score of 19.6 points (± 3.2) was observed, with a range of 10 to 24 points. Table 2 presents the relationship between the demand-control quadrants and social support.

Table 2. Relationship between the demand-control quadrants and the social support dimension of the JSS. São Paulo, SP, Brazil, 2025

Demand-Control Quadrants (JSS)	High social support n (%)	Low social support n (%)	Total n (%)
High burnout ($\uparrow D \downarrow C$)	10 (90.9)	1 (9.1)	11 (23)
Active work ($\uparrow D \uparrow C$)	8 (61.5)	5 (38.5)	13 (27)
Passive work ($\downarrow D \downarrow C$)	3 (33.3)	6 (66.7)	9 (19)
Low wear ($\downarrow D \uparrow C$)	4 (26.7)	11 (73.3)	15 (31)
Total	25	23	48 (100)

Legend: (N=48).

Source: The authors (2025).

Associations were analyzed between sociodemographic variables (age and years of training) and the presence of high occupational burnout. A higher proportion of nurses with high burnout was observed among those over 40 years of age, compared to younger nurses. Similarly, professionals with fewer years of training exhibited a higher frequency of high burnout when compared to those with more experience. For these analyses, we chose to consider the presence of high burnout as the outcome, as it represents the condition of greatest vulnerability to occupational stress and was found to be more appropriate for the study's sample size.

Finally, heterogeneity was observed in the overall distribution of the analyses, which may point to distinct realities within the same organizational environment, reflecting differences in how nurses perceive and experience their working conditions.

DISCUSSION

The participating professionals were distributed across the quadrants of the Demand-Control model, according to the scores obtained on the three dimensions assessed by the instrument. In this model, it is understood that workers classified in the high burnout quadrant—characterized by high levels of psychological demand associated with low control over work—represent the group most exposed to occupational stress. This configuration is often associated with significant adverse reactions, including greater emotional exhaustion, a sense of helplessness in the face of tasks, and an increased risk of mental health problems.¹³

On the other hand, active work—defined by a combination of high demands and a high degree of autonomy—offers professionals greater freedom to decide how and when to perform their activities, thereby promoting the use of their intellectual potential and the development of their own strategies for coping with daily challenges. Although this profile involves intense demands, it tends to be less harmful, provided it is accompanied by institutional support and adequate working conditions.¹²

Passive work, which combines low demands with low control, has been associated with effects on health that are less immediate but potentially harmful over time. This scenario can lead to disengagement, a narrowing of technical skills, and a reduced ability to adapt to new situations.¹⁴ The “low- -burnout” quadrant, resulting from the combination of low demand and high control, is traditionally interpreted as the most favorable for emotional balance and well-being at work and is considered close to the ideal scenario.¹²

The study aimed to assess occupational stress among nurses working in organ procurement organizations (OPOs) in Brazil, a professional context characterized by high technical complexity, intense emotional strain, and the need for rapid decision-making in situations often marked by the suffering of potential donors’ families. The distribution of participants across the quadrants of the Demand-Control and Support model revealed a predominance of low-strain and active work profiles. Low strain is characterized by a combination of low psychological demand and high control over work. This configuration is considered the most favorable from a psychosocial perspective, as it combines lower task pressure with greater autonomy in organizing daily activities.¹⁵

Thus, professionals fitting this profile tend to exhibit lower rates of psychological distress, greater job satisfaction, and a better perception of quality of life at work. Furthermore, autonomy fosters the development of personal problem-solving strategies, enhancing feelings of self-confidence and a sense of belonging. In the context of OPOs, the predominance of this quadrant suggests that, despite the specific characteristics and technical complexity of the role, there are institutional conditions that promote emotional balance and well-being among some professionals. However, the coexistence of contrasting profiles within the same team highlights the need for ongoing initiatives to promote mental health and manage workloads.¹⁵

However, when correlating with the dimension of social support, it is observed that the majority of professionals who perceive low burnout also report low social support at work. This contradiction reveals an ambiguous scenario: although these professionals report lower psychological overload and greater autonomy, the fragility of interpersonal relationships and the lack of institutional support may compromise their ability to cope with adverse situations over time. Social support in the workplace - especially that provided by colleagues and supervisors - is considered an important protective factor against mental health issues, as it fosters a collective approach to overcoming difficulties, strengthens the sense of belonging, and reduces feelings of isolation in decision-making. Thus, even within a theoretically favorable setting, a lack of support can limit the expected benefits and increase these workers’ emotional vulnerability in the face of the complexities of care in OPOs.¹⁶

This finding highlights the complexity of the relationships among the dimensions of the Demand-Control-Support model. Although the low-stress quadrant is traditionally associated with more favorable working conditions, the presence of low social support among these professionals suggests a more complex scenario. It is possible that, even in contexts with less demand pressure and greater autonomy, organizational factors such as ineffective communication, poor team integration, or a lack of institutional support may negatively influence the perception of social support. Furthermore, cultural and structural factors within public health organizations may contribute to more individualized work relationships, in which professionals - despite having good

control over their activities - do not perceive themselves as part of a consistent support network. This finding reinforces the importance of considering social support as an independent and fundamental dimension in the analysis of occupational stress, even in seemingly favorable contexts.¹²

The active work quadrant profile results from a combination of high psychological demands and high control over work; it is traditionally interpreted as a scenario of positive challenge, as it associates a heavy workload with the possibility of autonomy in decision-making. Workers in this configuration tend to experience work as an opportunity for growth and learning, since the high degree of control fosters the use of intellectual potential and the development of their own strategies for coping with complex situations. However, although it is recognized as less harmful to emotional well-being, active work can become a source of stress when there is no adequate institutional support, especially in contexts that require rapid decisions and a high level of technical responsibility, as is the case in OPOs.¹³

Regarding the high-burnout and passive work quadrants, the findings indicate that some nurses perceive their work environment as characterized by specialized knowledge and/or a heavy workload - a combination widely recognized as a risk factor for occupational stress.¹⁷

In the high-stress quadrant, high demand coexists with low control. This profile is traditionally recognized as the one most vulnerable to mental and emotional illness, due to the constant pressure associated with limited decision-making resources and institutional support. Studies conducted in hospital settings show that this configuration is directly related to an increased incidence of mood disorders, anxiety, absenteeism, and intention to leave the profession.¹⁵

In the passive work quadrant, the configuration is characterized by a combination of low psychological demand and low control over work, which may suggest an environment that appears low-stress at first glance. However, studies indicate that this condition tends to foster progressive disinterest, loss of initiative, and atrophy of professional skills, as it reduces opportunities for decision-making and tackling challenges that promote technical growth and autonomy. Passive work is associated with a state of demotivation and conformism, in which professionals tend to distance themselves from critical engagement with their activities, which can compromise both the quality of care and the development of competencies over time. In the context of public health organizations (OPOs), this finding is particularly concerning, given that the full exercise of their duties requires decision-making ability, flexibility, and engagement in complex and sensitive situations.¹⁶

On the other hand, the social support dimension acts as a significant moderator, potentially reducing the impact of stress on workers' health, particularly among the most vulnerable groups.¹² Thus, the high score on the social support dimension observed in the high burnout quadrant suggests that participants perceive positive interpersonal relationships in the workplace, which can act as a protective factor. Support from colleagues and supervisors ranks among the elements that contribute most to mitigating the adverse effects of emotional overload and excessive demands, fostering greater resilience and job satisfaction. This finding reinforces the need for institutional policies that strengthen teamwork, provide spaces for qualified listening, and promote ongoing training.¹⁶

It was observed that participants were evenly distributed across quadrants of higher and lower vulnerability to stress, highlighting the coexistence of different realities within the same organizational context. While some nurses perceive more favorable working conditions, others are exposed to combinations of risks - particularly related to high demand and the complexity of their activities. In the context of emergency care units, which require technical expertise, decision-making in critical situations,

and interaction with family members, these dynamics may be experienced differently among professionals. Although such characteristics foster professional development and autonomy, they can also intensify psychological pressure and the risk of burnout, especially in the absence of adequate institutional support.¹⁸⁻¹⁹

Finally, the profile of the results suggests that, although the work environment in OPOs is similar in terms of the functions performed by nurses, the experience of carrying out these functions varies and may be related to cultural and social aspects specific to each region of the country. This finding reinforces the importance of monitoring the quality of the work environment and developing practices and strategies that are sensitive to the specific local realities of these professionals.

The study had some limitations. The planned sample size of 82 participants was not reached; instead, data from 48 nurses were analyzed, which calls for caution when generalizing the results. No information was collected on the participants' geographic distribution or institutional affiliation, limiting the analysis of regional representativeness, especially given the possible differences among OPOs in different regions of the country. Also noteworthy is the possibility of selection bias, resulting from indirect recruitment through technical supervisors, with no guarantee that all eligible professionals were equally invited, as well as the inability to estimate the response rate, which may indicate nonresponse bias. Finally, because this is a cross-sectional study, it is not possible to establish causal relationships.

CONCLUSION

The results presented here reinforce the idea that work in OBOs cannot be understood merely as a technical activity, but rather as a practice that combines specialized skills, a high degree of initiative, and the ability to cope with unique emotional and moral pressures. Thus, management strategies should prioritize measures that promote a balance between demands and autonomy, recognize the centrality of social support, and consider the psychosocial risks inherent to this specific nursing context.

The JSS analysis allowed for an assessment of the distribution of professionals across the quadrants of the Demand-Control-Support model, and it was observed that half of the professionals perceive stress as low strain and active work, while the other half perceive it as high strain and passive work. Despite the positive perception regarding social support and autonomy, the intermediate scores on the demand and control dimensions reveal the coexistence of risk factors that warrant institutional attention.

It can therefore be concluded that the work of nurses in OPOs requires not only technical knowledge but also organizational support that addresses their specific psychosocial needs. Investing in worker-care policies, promoting spaces for listening and recognition, and ensuring adequate working conditions are essential to preserving the mental health of professionals and, consequently, contributing to the quality and continuity of the organ donation process in Brazil.

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