



# Burnout syndrome in teachers and residents of surgical programs at a public university

## Síndrome de desgaste ocupacional en docentes y residentes de programas quirúrgicos de una universidad pública

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**Abstract:** Occupational burnout is related to psychosocial risks such as high social exposure and long hours. This phenomenon is observed in medicine, although each specialty faces different challenges. Objective: To determine the presence of occupational burnout in teachers and residents of surgical programs at a public university and the main characteristics of the related academic and care environment. Methodology: Descriptive cross-sectional study carried out between August and November 2021. 36 professors and 48 residents of surgical programs at the Universidad del Valle in Cali, Colombia participated. The survey contained sociodemographic information, habits, description of environments, and the MBI-HSS, PHQ-9, and GAD-7 scales. Results: No presence of burnout was found among teachers, 32% of residents met criteria for burnout. When discriminating by subscales, a high and moderate presence of emotional exhaustion was identified in both teachers and residents, high levels of depersonalization in residents, inversely proportional to levels of personal accomplishment. 28% of the teachers showed some level of anxiety and 31% different levels of depression. In the residents, 84% presented some level of anxiety and 59% different levels of depression. Among the factors of the academic care environment related to emotional exhaustion are spending more than 60 hours a week in the hospital, a high number of shifts and patients per shift, night shifts and less time for rest, findings that coincide with the depersonalization subscale. Conclusions: The presence of burnout is related to depressive and anxious symptoms. More than a third of the sample of teachers and residents presented depression and anxiety, being more frequent in surgeons in training. Surgical postgraduate students show a high presence of occupational burnout syndrome, with significant emotional exhaustion, depersonalization and low personal accomplishment, unlike their teachers, who show emotional exhaustion, anxiety and depression, but not occupational burnout.

**Keywords:** Burnout; Professional exhaustion; Depression; Anxiety; Surgical specialization

**Resumen:** El desgaste ocupacional se relaciona con riesgos psicosociales como alta exposición social y largas jornadas. Este fenómeno se observa en la medicina, aunque cada especialidad enfrenta retos distintos. Objetivo: Determinar la presencia de desgaste ocupacional en docentes y residentes de los programas quirúrgicos en una universidad pública y las principales características del entorno académico y asistencial relacionadas. Metodología: Estudio descriptivo de corte transversal realizado entre agosto y noviembre de 2021. Participaron 36 profesores y 48 residentes de programas quirúrgicos de la Universidad del Valle en Cali, Colombia. La encuesta contenía información sociodemográfica, hábitos, descripción de entornos y las escalas MBI-HSS, PHQ-9 y GAD-7. Resultados: No se encontró presencia de burnout entre los profesores, 32% de los

residentes cumplían criterios para burnout. Al realizar la discriminación por subescalas se identificó presencia alta y moderada de agotamiento emocional tanto en docentes como en residentes, altos niveles de despersonalización en residentes, inversamente proporcional a los niveles de realización personal. El 28% de los docentes manifestaba algún nivel de ansiedad y 31% diferentes niveles de depresión. En los residentes 84% presentaba algún nivel de ansiedad y 59% diferentes niveles de depresión. Entre los factores del entorno académico asistencial relacionados al agotamiento emocional se encuentran, pasar más de 60 horas semanales en el hospital, un alto número de turnos y pacientes por turno, turnos nocturnos y menos tiempo de descanso, hallazgos que coinciden con la subescala de despersonalización. Conclusiones: La presencia de burnout se relaciona con síntomas depresivos y ansiosos. Más de un tercio de la muestra de profesores y residentes presentaba depresión y ansiedad, siendo más frecuente en cirujanos en formación. Los estudiantes de posgrados quirúrgicos muestran una alta presencia de síndrome de desgaste ocupacional, con significativo agotamiento emocional, despersonalización y baja realización personal, a diferencia de sus docentes, quienes evidencian agotamiento emocional, ansiedad y depresión, pero no desgaste ocupacional.

**Palabras clave:** Desgaste profesional; Agotamiento profesional; Depresión; Ansiedad; Especialización quirúrgica

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## 1. Introduction

Burnout syndrome, defined as a “state of mental and physical exhaustion caused by one’s professional life,” was first described by Herbert Freudenberger in 1974, who observed how volunteers from a substance abuse cessation clinic, after one year of working, presented exhaustion, anxious and depressive symptoms, low motivation and deterioration in the performance of their duties. Later, Christina Maslach and Susan Jackson grouped the symptoms into three dimensions: emotional exhaustion, depersonalization and lack of personal accomplishment, from which they developed the evaluation instrument, Maslach Burnout Inventory (MBI) (1-2). This syndrome has been associated with psychosocial risks at work, for example, high social exposure, long working hours, repetitive and routine activities or those that require sustained attention (3), which have a significant impact on the well-being of workers, being related to cardiovascular disease, anxiety, depression, fatigue, work accidents, substance abuse, musculoskeletal disorders, allergies, metabolic disorders and interpersonal conflicts (1).

Burnout syndrome is related to multiple determinants. Individual determinants include: considering work as a priority, poor tolerance to frustration and perfectionism. In relation to work, work hours, work environment, type of leadership and freedom to make decisions have been identified, and social factors include the absence of an adequate support network (4). This pattern has been documented in the medical profession. However, this professional group is not homogeneous. In the case of surgeons, there is an implicit code of rules, norms and expectations, which includes arriving early, staying late, working nights and weekends, performing a high volume of procedures and meeting multiple goals simultaneously. All of this without complaint and putting their personal and emotional life aside from their work life, so that the former does not interfere with their performance (5). Shanafelt et al. found that those surgeons whose satisfaction was based exclusively on billing/productivity, greater number of hours per week and more nights on call per week, had higher rates of burnout (5-6). In a study that included 582 surgeons who trained at the University of Michigan – Ann Arbor, burnout was found to be associated with the feeling that the work was “overwhelming”; a perceived imbalance between professional, family and personal growth, perception that the career is not rewarding and lack of autonomy. In addition, surgeons must perform complex procedures and constantly adapt to the emergence of new technologies, under restrictive time limits and in an environment plagued by distractions and interruptions (7).

Another aspect to consider is the hospital's work environment, since factors such as overcrowding, noise, interference, and lack of space for comfort can negatively influence the patient's mood. In addition, frequent shifts subject the professional to continuous wear and tear, which prevents them from acquiring healthy habits and facilitates the appearance of interpersonal and family problems (8). Occupational burnout in the strictest sense is reserved for work situations, however, this same notion has been used in students, both undergraduate and graduate, in particular, when their activities include tasks similar to those available in a work environment (9). Residents, physicians, have also been identified as a group with high levels of burnout, which has been associated with depression and problematic patient management (10). Arab et al. applied the MBI scale virtually at the Catholic University of Chile to residents of first and second specialties; they found that on average 18% of first specialty residents were at high risk for burnout and 7.53% in second specialty (11). Jácome et al. used the MBI in 40 residents of medical specialties at a public university in Cauca, Colombia in 2017, finding high levels of emotional exhaustion (12).

In 2018, the Colombian Congress regulated the National System of Medical Residencies through Law 1917, with the aim of guaranteeing adequate conditions for the academic training and practice of professionals who are enrolled in medical-surgical specialization programs. This law considers, among other things, a special contract for training practice that includes a limit of hours of dedication to academic, care and research activities: 12 hours per shift and a maximum of 66 hours per week (13). In the local context, Guevara et al. conducted a study in 2002 in which they evaluated the burnout of interns and residents at the Valle University Departmental Hospital. Of 150 participants, 128 (85.35%) presented a moderate to severe burnout syndrome. They found an association between burnout and the number of weekly shifts and identified that 90% of these physicians presented family dysfunction, determined by a family APGAR score less than 18 (14).

The MBI scale has been the most widely used instrument for the assessment of burnout syndrome, and has been validated in different countries. An adaptation of this scale, MBI-HSS (Maslach Burnout Inventory-Human Services Survey), for health personnel, has been used in several studies in the country and was validated in 2010 in the city of Cali (Colombia). They found that there was adequate internal consistency ( $\alpha=0.76$ ), which was lower for the depersonalization subscale ( $\alpha=0.58$ ) (15). Burnout syndrome has also been associated with anxiety and depression (16-17). The PHQ-9 scale was validated in Colombia in 2014 in health sciences students in Cartagena, finding a Cronbach's alpha coefficient of 0.830 and McDonald's omega of 0.89. In another study carried out in 2020 in Bucaramanga in primary care users, similar values were found (18-19). Regarding instruments used to assess anxiety symptoms, the GAD-7 scale, in its version translated into Spanish, has a sensitivity of 86.8%, specificity of 93.4% and a Cronbach's alpha of 0.93 and had a significant correlation with other scales (18, 20).

Taking into account the above, through this work we seek to determine the presence of occupational burnout syndrome in professors and residents of surgical programs at the Universidad del Valle and to identify the main characteristics of the academic and healthcare environment related to its presence.

## 2. Methods

Descriptive cross-sectional study conducted between August and November 2021. The population consisted of teachers and residents of the surgical specialty programs at Universidad del Valle, which include general surgery, orthopedics, plastic surgery, neurosurgery, otorhinolaryngology, trauma and emergency surgery, pediatric surgery, dermatology and dermatologic surgery, gynecology and obstetrics, ophthalmology and urology. The invitation to participate was made through the institutional email in which a link was provided in which they had access to the informed consent and virtual survey on Google forms. The virtual modality was

chosen due to the SARS-CoV-2 pandemic. The email of one of the researchers was included to resolve doubts during the completion. The surveys consisted of sociodemographic information, personal habits, description of academic and care environments (Table 1), in addition to the MBI-HSS scales with its three subscales: emotional exhaustion (which includes the feeling of being exhausted or overworked at work), depersonalization (which assesses the possibility of having impersonal reactions towards patients) and personal accomplishment (which includes the feeling of competence and achievements at work), PHQ-9 and GAD-7, the three scales have a Likert scale type measurement.

**Table 1.** Sociodemographic variables, personal habits and description of environments.

<b>Sociodemographic information</b>	
Age	People you live with
Gender	Type of social security
Marital status	Socioeconomic stratum
Origin	Economic dependence
Practice of religion	Children
<b>Personal habits information</b>	
Physical activity	Time spent on transportation to the internship site
Alcohol consumption in the last month	
Smoking	Time spent on leisure activities each week
Consumption of psychoactive substances	
<b>Information on academic and care activities and environment</b>	
Occupation	Type of institution in which you carry out your activities
Specialty	Number of hours in the hospital per week
Place of practice	Number of hours in the operating room per week
Job sites	Number of hours spent on academic activities each week
Additional activities	

The data were transferred to an Excel database, with the respective coding of the variables. The information was analyzed with the statistical software R-Studio, initially a univariate descriptive analysis was performed. Comparisons of the qualitative variables were made using the Chi-Square test and continuous variables were compared using the T-Student test. Subsequently, a multivariate model was developed that allowed establishing relationships between the variables of interest. These association results were established using OR (Odds Ratio), with their respective confidence interval. Additionally, an analysis focused on the correlation of the three instruments evaluated was performed. This work was submitted and accepted by the Ethics and Health Research Committee (CIREH) of the Universidad del Valle, through Act 002-021. All participants received and signed the informed consent, respecting the anonymity of the responses at all times.

### 3. Results

#### Sociodemographic characteristics

At the time of the study, the surgical academic units had a total population of 251 individuals, 152 teachers (including appointed and contracted professors) and 99 residents. A sample of 84 participants was obtained, representing 33% of the universe.

#### Occupation

Of the 84 participants, the sample was represented by 36 professors and 48 residents, the percentage representation is shown in Figure 1. The sample size did not allow discrimination by specialty or year of residency.

**Figure 1.** Participants in surgical programs



Among the professors, the average age was 51.5 years, 72% were in a stable relationship, 83% had children and 91% had people who were economically dependent on them. Regarding their workplace, 69% worked in more than one institution, 31% in public institutions, 25% in private ones and 44% in both. In the group of residents, the average age for those in the first specialty was 29.5 years and among those in the second specialty 38 years. 68% reported not having a partner and 86% did not have children. 25% of the sample of residents had people who were economically dependent on them. No burnout was found among the group of professors; among the residents, 32% met the criteria for burnout. However, when discriminating by subscales, a high and moderate presence of emotional exhaustion was identified in both professors and residents, with high levels of depersonalization in residents that was inversely proportional to the levels of personal achievement. For details, see Table 2.

**Table 2.** Burnout, subscales and occupation.

Burnout	Emotional Exhaustion Subscale			Depersonalization subscale			Personal achievement subscale		
	Low	Half	High	Low	Half	High	Low	Half	High
Teaching	23 (64)	8 (22)	5 (14)	24 (67)	11 (31)	1 (3)	7 (19)	6 (17)	23 (64)
Resident	8 (18)	9 (20)	27 (61)	18 (41)	8 (18)	18 (41)	24 (55)	15 (34)	5 (11)

Data are n (%). In all cases,  $p < 0.00$

When comparing occupation and anxiety levels, it was found that 28% of teachers reported some level of anxiety, in residents this was 84%. When the comparison was made between occupation and depression, it was found that 31% of teachers reported some level of depression, mainly at mild and moderate levels, which contrasts with 84% of residents who reported different levels of depression, of these 16% presented severe levels (see table 3).

**Table 3.** Occupation and depression levels

Depression Scale (PHQ9)	Teachers %	Residents %
None or minimal	69	16
Mild	17	25
Moderate	11	18
Moderate severe	0	25
Serious	3	16

*Gender*

Forty-nine men and 35 women participated. Women were represented mainly by residents. In the sample of professors, 8 were women and 28 were men. 66% of women reported not having a partner, unlike their male colleagues, of whom 61% were in a stable relationship ( $p=0.03$ ). Similarly, 65% of women did not have children or dependents. Regarding the economic aspect, the minority of women had additional sources of income (31%), the opposite being the case for men, with 65%. In the questions related to habits, it was found that the majority of men performed physical activity (76%), while just over half of women reported being sedentary (51%).

There was no major difference by gender in the overall burnout rating, but there was a difference by subscales. It was found that 54% of women reported high levels of emotional exhaustion ( $p=0.01$ ). In addition, 74% of women reported some level of anxiety, men reported 49% ( $p=0.09$ ). Regarding depression, there is also a higher report of depression among women (77%), the majority with scores compatible with moderate, moderately severe and severe symptoms (54%). For men, the total depression was 49% ( $p=0.08$ ), with scores from moderate to severe in 29%.

*Place of origin and residence*

Cali was the place of origin of the majority of participants, but among the residents, 48% came from another place. All reported living in stratum 3 or higher, with the majority living in stratum 5. The average time spent on transportation, per trip to the hospital, was 20 minutes. No significant difference was found on any scale with these factors.

*Social security*

All residents were affiliated with the health system. 39% of residents and 89% of teachers had a supplementary plan. Those who did not have a supplementary plan (private insurance) showed some level of emotional exhaustion (77%), derealization (58%) and low personal achievement (55%).

*Religious beliefs*

The majority had a religious belief (81%), with no significant differences found with those who do not profess a religion on the scales evaluated.

*Habits**Physical activity*

83% of teachers reported physical activity during the week, compared to 17% who identified themselves as sedentary. Among residents, 36% did not engage in physical activity, 46% engaged in between 1 to 4 hours per week, and 18% engaged in more than 5 hours per week. It was found that emotional exhaustion was inversely proportional to the hours of exercise; 50% of sedentary people showed high levels of emotional exhaustion and 30% moderate ( $p=0.02$ ). This same effect was found on depersonalization, which decreased as the hours of physical activity increased, although

without reaching statistical significance. In addition, those who engaged in physical activity more than 5 hours per week had medium (20%) and high (60%) scores of personal accomplishment.

#### *Consumption of alcohol, tobacco, coffee and other stimulants*

Regarding alcohol, 24% reported not consuming alcohol, 53% 1-2 times a month, and 23% more than 3 times a month. Similar scores were found in these groups on the emotional exhaustion subscale. On the depersonalization subscale, a tendency was found to present higher scores as alcohol consumption increased, with scores above the mean level in 35%, 49%, and 58% respectively ( $p=0.56$ ). On the personal accomplishment subscale, a tendency was found to present a higher percentage of accomplishment in people without alcohol consumption (70%), compared to those who consumed more than 3 times a month (58%). The majority of participants (94%) did not consume tobacco. On the other hand, 13% reported not drinking coffee, 40% drank it 1-2 times a day, 31% 3-4 times a day, 10% 5-6 times a day, and 6% more than 6 times a day. Some level of emotional exhaustion was found in non-drinkers (36%), however, it was found to be higher (80%) in those who reported drinking coffee more than 6 times a day. Medium to high depersonalization was found in 18.8% of those who did not drink coffee, compared to 60% of those who drank it more than 6 times a day. 32% of participants reported stimulant use. Among stimulant users, 63% had high levels of emotional exhaustion, compared to 28% among non-users ( $p=0.00$ ). In the depersonalization subscale, high scores were found in 44% of stimulant users compared to 15% of non-users ( $p=0.01$ ). As expected, these results were inversely proportional to personal accomplishment: 7% in users and 49% in non-users ( $p=0.00$ ). No correlation was found between depressive or anxious symptoms and the use of stimulants.

#### *Characteristics of the academic and care environment*

Regarding the place of practice, the operating room predominated (40%), followed by the outpatient clinic (24%) and the emergency room (23%). The highest scores of emotional exhaustion were found in those who carried out activities mainly in the emergency room (84%), followed by the operating room (65%), as opposed to those who were mainly in the outpatient clinic (25%) ( $p=0.00$ ). This finding is correlated with the levels of depersonalization, 58% of those who were in the emergency room, 44% in the operating room and 30% in the outpatient clinic ( $p=0.11$ ). In the personal accomplishment subscale, 60% of those who were mainly active in outpatient clinics reported high levels and 35% reported medium levels, compared to those who were mainly in the operating room, who had scores of 35% and 24% for high and medium levels respectively, unlike those who were in the emergency room with 21% of high levels, compared to 53% who reported low levels of accomplishment ( $p = 0.00$ ). 54% of the respondents, during the last two months had been carrying out academic-assistance activities in a public institution, 18% in a private institution and 29% in both. The levels of emotional exhaustion were reported higher in those who are carrying out the activities in public institutions. The interviewees spent an average of 55.50 hours in the hospital each week. Of these, 14 hours are spent in the operating room. The number of shifts per month varied between 0 and 8.25 and night shifts from 0 to 4. The number of patients in a shift varied from 6 to 20, with an average of 11. The approximate rest time before a shift was 2 hours and after a shift was 6 hours. Finally, the hours dedicated to academic activity were approximately 12 per week.

Of the above factors, the following could be related to emotional exhaustion: being in the hospital more than 60 hours a week ( $p=0.00$ ), an average of eight shifts a month ( $p=0.07$ ), more than two night shifts a month ( $p=0.03$ ), a higher number of patients per shift ( $p=0.01$ ), less leisure time ( $p=0.01$ ) and less rest time before the shift ( $p=0.03$ ). Spending more time in the hospital ( $p=0.00$ ), a higher number of night shifts ( $p=0.00$ ) and a higher number of patients per shift ( $p=0.00$ ) were related to greater depersonalization.

#### *Associated mental health conditions*

### Depression

61% of respondents reported some level of depressive symptoms, of these 10% had scores that lead to consider that they were suffering from severe depression, 14% were being treated with antidepressants. In the sociodemographic factors, the following were found to be related to moderate to severe depressive symptoms: not having a partner ( $p = 0.04$ ), not having children ( $p = 0.00$ ), belonging to socioeconomic stratum 3-4 ( $p = 0.04$ ), sedentary lifestyle ( $p = 0.03$ ) and use of stimulants ( $p = 0.00$ ). In the factors related to the academic and care environment, the following were related to these symptoms: less time off before the shift ( $p = 0.02$ ) and spending a greater number of hours in the hospital ( $p = 0.00$ ). In addition, it was found that all the people surveyed who presented moderate to severe depressive symptoms presented burnout (15%). For further details on the correlation between affective symptoms and burnout, see Table 4.

### Anxiety

40% of respondents had some degree of anxiety, of these, 12% considered it severe, 19% moderate and 32% mild. Among the sociodemographic factors related to this symptomatology were: not having a partner ( $p = 0.03$ ), living in strata 3-4 ( $p = 0.03$ ), sedentary lifestyle ( $p = 0.02$ ), use of stimulants ( $p = 0.00$ ) and performance of activities in the emergency service ( $p = 0.08$ ). Regarding the academic and care factors associated with anxiety symptoms, the following were found to be related to: spending a greater number of hours in the hospital ( $p = 0.00$ ), a greater number of hours dedicated to academic activity ( $p = 0.04$ ), a greater number of night shifts ( $p = 0.04$ ) and less rest time before shifts ( $p = 0.02$ ). All the people surveyed with burnout (15%) also had some degree of anxiety.

**Table 4.** Presence of depression – anxiety and its correlation with burnout

Mental health conditions	Total (%)	Presence of burnout syndrome		
		No	Yeah	p-value
<b>Depression scale</b>	<b>n = 84 (%)</b>	<b>n = 69 (%)</b>	<b>n = 15 (%)</b>	
<b>Minimum</b>	33 (39)	33 (100)	0 (0)	0.00
<b>Mild</b>	18 (21)	18 (100)	0 (0)	
<b>Moderate</b>	14 (17)	8 (57)	6 (43)	
<b>Moderate severe</b>	11 (13)	7 (64)	4 (36)	
<b>Serious</b>	8 (10)	3 (38)	5 (62)	
<b>Anxiety scale</b>	<b>n = 84 (%)</b>	<b>n = 69 (%)</b>	<b>n = 15 (%)</b>	
<b>No anxiety is appreciated</b>	34 (40)	34 (100.00)	0 (0)	0.00
<b>Do you have any type of anxiety?</b>	50 (60)	35 (70.00)	15 (30)	

#### Additional factors

An open-ended question was included in which participants mentioned additional factors that influenced their mood: being away from their family, illnesses in family members, changes in employment conditions, poor relationships between peers, and the lack of adherence of their graduate program to the hour limits established by the resident law and the clinical graduate regulations.



#### 4. Discussion

This study contributes to the understanding of the factors involved in the appearance of burnout syndrome, depression and anxiety in residents and teachers of surgical specialties. Although burnout was not found in the second group, there was a significant percentage of teachers who presented emotional exhaustion, anxiety and depressive symptoms. We do not intend to establish linear causalities between the factors evidenced and emotional symptoms. It is clear that there is a wide range of determinants, including sociodemographic factors, environmental situations and personal habits. The presence of burnout in our sample was correlated with depressive and anxious symptoms, a finding that Villavicencio shares in medical residents and interns in Lima (17). When we discriminated the three subscales of the MBI-HSS, we found that in all of them the associated factors were being a resident, being a woman, not having private health insurance and being sedentary. Also the presence of habits such as high coffee consumption and the use of stimulants, which are correlated with the presence of activities in public institutions and in high-stress spaces: emergency services and operating rooms, these factors are also present in the population with depressive and anxious symptoms. Finally, the analysis by factor categories confirms the concurrence of affective symptoms, environments and situations with a high degree of stress, unhealthy personal habits and sociodemographic characteristics that, in our sample, were mainly related to the characteristics of the residents (see table 5).

**Table 5.** Relationship by category of factors and symptoms of burnout, depression and anxiety

<b>Sociodemographic</b>	<b>Habits</b>	<b>Academic and care environment</b>	<b>Associated mental health conditions</b>
Women	Sedentary lifestyle	Greater number of hours in the hospital	Greater presence of burnout in people with depressive symptoms
Singleness	Use of stimulants	More night shifts	Greater presence of burnout in people with anxiety symptoms
Resident	Alcohol consumption more than 3 times a month	Greater number of hours dedicated to academic activities	
Without private health insurance	Drinking coffee more than six times a day	Less rest time before shifts (guards)	
Economic stratum 3 and 4		Carry out activities in emergency services and operating rooms	
		Rotate in public institutions	

It is important to note that this distinction by categories is made for purely organizational purposes, since all of them are closely related. Thus, for example, the possibility of doing physical activity or the increase in the consumption of caffeine and stimulants may be related to the workload, and the presence of children or additional sources of income may be related to the moment of the course of life in which one finds oneself and with one's occupation. Another factor associated with emotional exhaustion, depression and anxiety was being a woman. If the above considerations are not taken into account, it could be given the impression that it is a purely biological issue, but when analyzing the data in more detail, it is found that the majority of women were residents, a population with greater exposure to other determinants already analyzed.

Furthermore, being a woman in a surgical setting brings additional stressors and challenges. In a study conducted by Hu et al. in 2018, over 50% of surgical residents reported some form of abuse, and all types of abuse were reported more frequently in women (6).

It would also be worth asking about the reason why most faculty members in these programs are men and how this might influence how residents are perceived and treated in this space. In a mixed study conducted by Dahlke et al., it was identified that female residents had a dual pressure derived from expectations of fulfilling a double role (home and residency responsibilities), but that, despite this, they spent more hours in the hospital than male residents. Based on the findings of their interviews, they considered that, in part, this could be related to the lack of female leadership and mentoring in their programs. They highlight previous studies in which it has been found that surgeons prefer not to mentor residents for fear that their relationship would be considered inappropriate (21). This is consistent with what was found in the study conducted by Coletti et al., in which they found that 71% of men in their residency had a mentor compared to 33% of women (22).

Regarding the aspects of the academic and care environment associated with the appearance of symptoms, most are related to the number of hours dedicated to residency activities, which has been regulated since 2018 by Law 1917 and which states that the resident's dedication may not exceed 12 hours per shift and 66 hours per week, including academic, service provision and research activities (13).

When summing up the hours, it was found that 9 of 48 residents surveyed exceeded the regulatory number of hours, reporting up to 116 hours per week, 21 of 48 had no rest before a shift, and 16 of 48 had no rest after a shift. Shanafelt et al. in their 2009 study, had already reported a correlation between a greater number of working hours per week and night shifts with risk of burnout, however, their study population did not include surgeons in training, only graduates (5). Hu et al., on the other hand, observed in a similar way to our findings, that residents in surgical programs that exceeded the limits of working hours had worse results in their mental health (6).

## 5. Conclusions

- Surgical postgraduate students are a population with a significant presence of burnout syndrome, with significant levels of emotional exhaustion, depersonalization and low levels of personal accomplishment, in contrast to their teachers, in whom burnout was not evident. However, this result should be taken with caution, given that there is evidence in this population of emotional exhaustion, anxiety and depression.
- It is important to consider the relationship between working conditions and psychological distress, particularly in surgeons in training. More than a third of the sample, including professors and residents, presented some level of depression and anxiety, with the highest incidence among surgeons in training.
- We found a significant relationship between the number of hours of dedication per week, the number of shifts, mainly at night, and less rest time with high levels of emotional exhaustion. In Colombia, progress has been made since the implementation of the Clinical Residency Law, but this regulatory mandate must be complemented with modifications in the relationship models, structural readjustments in the curricula and well-being actions from educational institutions and teaching hospitals, represented in interventions to promote mental health and risk management.

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## References

1. Carrillo-Esper R, Gómez Hernández K, Espinoza de lo Monteros Estrada I. Burnout syndrome in medical practice. *Med Int Mex*. November 2012;28(6):579-84. <https://biblat.unam.mx/es/revista/medicina-interna-de-mexico/articulo/sindrome-de-burnout-en-la-practica-medica>
2. Moreno-Jiménez B, Rodríguez-Carvajal R, Escobar Redonda E. The Assessment of Professional Burnout. Factorization of the MBI-GS. A preliminary analysis. *Anxiety and Stress*. 2001;7(1):69-77. <https://dialnet.unirioja.es/servlet/articulo?codigo=186760>
3. Linares Parra G del V, Guedez Salas YS. Burnout syndrome, an invisible illness among health professionals. *Primary Care*. May 2021;53(5):102017. <https://doi.org/10.1016/j.aprim.2021.102017>
4. Aguirre Roldán AM, Quijano Barriga AM. Burnout Syndrome, Family and Work Related Variables on General Practitioners in Bogota. A Strategy of Work Quality. *Colombian Journal of Psychiatry*. 2015;44(4):198-205. <https://doi.org/10.1016/j.rcp.2015.05.017>
5. Shanafelt TD, Balch CM, Bechamps GJ, Russell T, Dyrbye L, Satele D, et al. Burnout and career satisfaction among American surgeons. *Annals of Surgery*. 2009; 250(3): 463-70. <https://doi.org/10.1097/SLA.0b013e3181ac4dfd>
6. Hu YY, Ellis RJ, Hewitt DB, Yang AD, Cheung EO, Moskowitz JT, et al. Discrimination, Abuse, Harassment, and Burnout in Surgical Residency Training. *New England Journal of Medicine*. 2019;381(18):1741-52. <http://doi.org/10.1056/NEJMsa1903759>
7. Vijendren A, Yung M, Sanchez J. The ill surgeon: a review of common work-related health problems among UK surgeons. *Langenbeck's Archives of Surgery*. 2014;399(8):967-79. <http://doi.org/10.1007/s00423-014-1233-3>
8. Moreno-Egea A, Latorre-Reviriego I, De Miquel J, Campillo-Soto A, Sáez J, Aguayo JL. Society and surgery. Burnout and surgeons. *Spanish Surgery*. 2008; 83(3):118-24. [http://doi.org/10.1016/S0009-739X\(08\)70525-6](http://doi.org/10.1016/S0009-739X(08)70525-6)
9. Belloch García SL, Renovell Farré V, Calabuig Alborch JR, Gómez Salinas L. Burnout syndrome in medical residents of hospital medical specialties. *An med interna*. 2000;17(3):118-22. <https://pesquisa.bvsalud.org/portal/resource/pt/ibc-153>
10. Thomas NK. On call: Issues in graduate medical education Resident Burnout. 2004;292(23):2880-9. <http://doi.org/10.1001/jama.292.23.2880>
11. Arab JP, Díaz LA, Véliz D, Riquelme A, González M. Burnout in residents of specialties and subspecialties: quantitative analysis and associations. *Research in Medical Education*. 2015;4(14):112-3. [http://doi.org/10.1016/S2007-5057\(15\)30018-1](http://doi.org/10.1016/S2007-5057(15)30018-1)
12. Jácome SJ, Villaquirán-Hurtado AF, García CP, Duque IL. Prevalence of burnout syndrome in residents of medical specialties. *Cuidarte Journal*. 2018; 10(1):e543. <https://doi.org/10.15649/cuidarte.v10i1.543>
13. Republic of Colombia, Congress of Colombia. Law 1917 of 2018 "By means of which the system of medical residencies in Colombia is regulated, its financing mechanism and other provisions are issued." <https://www.suin-juriscol.gov.co/viewDocument.asp?ruta=Leyes/30035417>
14. Guevara CA, Henao DP, Herrera JA. Burnout syndrome in medical interns and residents. *Hospital Universitario del Valle, Cali*, 2002. *Colombia Médica*. 2004;35(4):173-8. <https://www.redalyc.org/articulo.oa?id=28335402>
15. Córdoba L, Tamayo JA, González MA, Martínez MI, Rosales A, Barbato SH. Adaptation and validation of the Maslach Burnout Inventory-Human Services Survey in Cali, Colombia. *Medical Colombia*. 2011;42(3):286-93. <https://doi.org/10.25100/cm.v42i3.874>
16. Loaiza Anco KB. General characteristics, level of burnout syndrome and its association with the level of anxiety, depression and family functionality in interns of the Goyeneche Hospital in Arequipa 2019 [Internet]. [Peru]: National University of San Agustín; 2019. Available at: <http://repositorio.unsa.edu.pe/handle/UNSA/8192>
17. Villavicencio Castro J. Association between depression and burnout syndrome in medical residents and interns at the Daniel Alcides Carrión National Hospital in 2015 [Internet] [EP Human Medicine Thesis]. [Peru]: Universidad Nacional Mayor de San Marcos; 2016. Available at: <https://hdl.handle.net/20.500.12672/4683>
18. Lemos M, López Medina DC, Henao Pérez M. Stress and mental health in medical students: Relationship with coping and extracurricular activities. *Archives of Medicine*. 2018;14(2):1-8.

- <https://dialnet.unirioja.es/servlet/articulo?codigo=6499267>
19. Cassiani-Miranda CA, Cuadros-Cruz AK, Torres-Pinzón H, Scoppetta O, Pinzón-Tarrazona JH, López-Fuentes WY, et al. Validity of the Patient Health Questionnaire-9 (PHQ-9) for depression screening in adult Primary Care users in Bucaramanga, Colombia. *Colombian Journal of Psychiatry*. 2021;50(1). <https://doi.org/10.1016/j.rcp.2019.09.001>
  20. García-Campayo J, Zamorano E, Ruiz MA, Pardo A, Pérez-Paramo M, López-Gómez V, et al. Cultural adaptation into Spanish of the generalized anxiety disorder-7 (GAD-7) scale as a screening tool. *Health and Quality of Life Outcomes*. 2010;8(1):8. [http://doi.org/10.1016/S0924-9338\(09\)70771-0](http://doi.org/10.1016/S0924-9338(09)70771-0)
  21. Dahlke AR, Johnson JK, Greenberg CC, Love R, Kreutzar L, Hewitt DB, et al. Gender Differences in Utilization of Duty-hour Regulations, Aspects of Burnout, and Psychological Well-being Among General Surgery Residents in the United States. *Annals of Surgery*. 2018;268(2):204-11. <http://doi.org/10.1097/SLA.0000000000002700>
  22. Colletti LM, Mulholland MW, Sonnad SS. Perceived Obstacles to Career Success for Women in Academic Surgery. *Archives of Surgery*. 2000 Aug 1;135(8):972-7. <http://doi.org/10.1001/archsurg.135.8.972>



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