

# Association between Burnout Syndrome and medical training by specialty in first-year residents

José Manuel Rosas-Navarro,<sup>1</sup> Sergio Armando Covarrubias-Castillo,<sup>2</sup> José Carlos Villalobos-Lizardi,<sup>3</sup> Daniel Alejandro Muñoz-Chacón,<sup>4</sup> Rogelio Bazúa O'Connor<sup>2</sup>

<sup>1</sup> Hospital Psiquiátrico Infantil Dr. Juan N. Navarro, Ciudad de México, México.

<sup>2</sup> Servicio de Psiquiatría, Hospital Civil de Guadalajara Fray Antonio Alcalde, Guadalajara, México.

<sup>3</sup> The Hospital for the Sick Children, Toronto, Canada.

<sup>4</sup> Centro Universitario de Ciencias de la Salud, Universidad de Guadalajara, Guadalajara, México.

## Correspondence:

Sergio Armando Covarrubias Castillo  
Servicio de Psiquiatría, Hospital Civil de Guadalajara Fray Antonio Alcalde,  
Calle Hospital 278,  
Colonia El Retiro,  
Guadalajara, Jalisco, México.  
Phone: 33 1709 – 7289  
Email: scovarrubias@hcg.gob.mx

Received: 30 June 2020

Accepted: 4 August 2020

## Citation:

Rosas-Navarro, J. M., Covarrubias-Castillo, S. A., Villalobos-Lizardi, J. C., Muñoz-Chacón, D. A., & Bazúa O'Connor, R. (2020). Association between Burnout Syndrome and medical training by specialty in first-year residents. *Salud Mental*, 43(5), 227-233.

DOI: [10.17711/SM.0185-3325.2020.031](https://doi.org/10.17711/SM.0185-3325.2020.031)



## ABSTRACT

**Introduction.** Burnout syndrome (BOS) comprises emotional exhaustion, depersonalization, and reduced personal accomplishment in those affected. Instruments such as the Maslach Burnout Inventory (MBI) can help to identify those affected. Physicians in training have been described as an at-risk group for this syndrome. **Objective.** Describe the association between BOS and medical training by specialty in first-year residents. **Method.** This is a cross-sectional analytical study of specialty residents at the Hospital Civil de Guadalajara. Sociodemographic data were obtained and the MBI was administered to identify BOS. Samples were compared, and a comparative analysis performed to identify factors associated with BOS. **Results.** Eighty-eight residents were included, with 21.6% ( $n = 19$ ) presenting BOS, 53.4% displaying emotional exhaustion ( $n = 47$ ), 53.7% showing depersonalization ( $n = 47$ ), and 39.8% reduced personal accomplishment ( $n = 35$ ). Presenting BOS was not associated with sociodemographic characteristics or type of specialty. Work hours ( $r = .229$ ,  $p = .032$ ), and a higher number of on-call hours/week ( $r = .34$ ,  $p = .001$ ) were associated with higher BOS. **Discussion and conclusion.** The prevalence of BOS was lower than expected. Over half scored for emotional exhaustion and depersonalization, which could be explained by a self-reporting bias. There was no association between the group/type of specialty and BOS. This study creates new knowledge that works as an institutional situational diagnosis, helps to determine the scope of the problem, and encourages to consider the contributing factors to its origin and maintenance.

**Keywords:** Burnout, medical residency, mental health, medicine.

## RESUMEN

**Introducción.** El síndrome de burnout (SBO) comprende el agotamiento emocional, la despersonalización y la reducción de la realización personal en aquellos a quienes afecta. Instrumentos como el Maslach Burnout Inventory (MBI) pueden ayudar a identificar a los afectados. Los médicos en formación se han descrito como un grupo de riesgo para presentar este síndrome. **Objetivo.** Describir la asociación entre el síndrome de burnout y la formación médica por especialidad en residentes de primer año. **Método.** Se trata de un estudio analítico transversal de residentes de especialidad del Hospital Civil de Guadalajara. Se obtuvieron datos sociodemográficos y se administró el MBI para identificar SBO. Se compararon las muestras y se realizó un análisis comparativo para identificar los factores asociados con SBO. **Resultados.** Se incluyeron 88 residentes, con 21.6% ( $n = 19$ ) presentando SBO; 53.4% mostrando agotamiento emocional ( $n = 47$ ); 53.7% ( $n = 47$ ) mostrando despersonalización; y 39.8% ( $n = 35$ ) reducción de realización personal. La presentación de SBO no se asoció a características sociodemográficas ni al tipo de especialidad. Las horas de trabajo ( $r = .229$ ,  $p = .032$ ) y un mayor número de horas de guardia/semana ( $r = .34$ ,  $p = .001$ ) se asociaron con una mayor BOS. **Discusión y conclusión.** La prevalencia de SBO fue menor de lo esperado. Más de la mitad puntuó por agotamiento emocional y despersonalización, lo que podría explicarse por un sesgo en la autoevaluación. No hubo asociación entre el grupo/tipo de especialidad y SBO. Este estudio genera nuevos conocimientos que funcionan como un diagnóstico situacional institucional, ayuda a determinar el alcance del problema y alienta a considerar los factores que contribuyen a su origen y mantenimiento.

**Palabras clave:** Burnout, residencia médica, salud mental, medicina.

## INTRODUCTION

Burnout syndrome (BOS), describes a set of symptoms and attitudes summarized as emotional exhaustion, perception, and detachment from problems, as well as reduced personal accomplishment in those affected. This phenomenon characteristically occurs in individuals engaged in caring for others and is probably related to the chronic stress caused by the psychosocial demands that patients present during their care process (Maslach & Jackson, 1981). Hopelessness, self-invalidation, and the inability to act to improve one's own condition are some examples of the conditions this phenomenon can produce (Gajewski, Boden, Freude, Potter, & Falkenstein, 2017).

Instruments such as the (MBI) have been developed and validated as a practical way of identifying affected populations and for some years now they have been used in most studies evaluating this phenomenon (Olivares-Faúndez, Mena-Miranda, Jélvez-Wilker, & Macía-Sepúlveda, 2014). Official sources have noted that BOS is a problem of global significance. In Mexico alone, it affects up to 75% of workers (El Universal, JADF, 2015). The consequences of failing to address this problem can affect personal as well as organizational spheres, constituting a risk factor for developing problems such as substance abuse, other psychiatric disorders, absenteeism, and decreased work performance. (Gutiérrez Aceves, Celis López, Moreno Jiménez, Fariás Serratos, & Suárez Campos, 2006). A Mexican review that included over thirteen thousand employees, from various professions in various states in Mexico, reported average values for experiencing burnout corresponding to the category of "once a month or less" on the BOS symptom frequency scale (Juárez-García, Idrovo, Camacho-Ávila, & Placencia-Reyes, 2014).

WHO statistics for 2015 reported that there were 139 doctors per 100,000 inhabitants worldwide. In Mexico, according to a 2011 census (the latest census conducted by the Instituto Nacional de Estadística y Geografía [INEGI]), there were 157 doctors for every 100,000 inhabitants. In 2015, the Organization for Economic Cooperation and Development (OECD) reported the existence of more specialist doctors than General Practitioners and family doctors (65% and 35%, respectively) in Mexico. In 2017, there were 147,910 medical specialists in the country (Heinze-Martin, Olmedo-Canchola, Bazán-Miranda, Bernard-Fuentes, & Guízar-Sánchez, 2018). A total of 54.2% of the latter were concentrated in Mexico City, Estado de México, Jalisco and Nuevo León, with the remaining 45.8% being distributed among the other 28 states. Of the 32 states in Mexico, Mexico City was the one with the highest rate of specialist doctors (505.7/100,000 inhabitants), followed by Nuevo León (185.3/100,000 inhabitants) and Jalisco (172/100,000 inhabitants) (Heinze-Martin et al., 2018), a reflection of a very low density of physicians in

large regions of Mexico, which can easily translate into a greater workload. Given the characteristics of the health system in Mexico, it is only to be expected that a significant percentage of this burden will be directly reflected in medical specialists in training.

Although there are studies of BOS in medical residents, incidence rates vary greatly from 18% to 82% in some studies (Willems, Monten, & Portzky, 2018). Other studies report verbal, psychological and physical abuse, and harassment during residency, generally from hierarchical superiors, affecting up to 90% of the doctors surveyed (Acosta-Fernández, Aguilera-Velasco, & Pozos-Radillo, 2017). The dual role of worker and student, the multiple lines of communication to which they have to respond, and the constant demand for attention in the performance of their work, added to the load of working hours, make trainee doctors particularly vulnerable to BOS.

BOS currently represents a serious health problem worldwide, requiring increasing attention from health prevention agency agendas in both high- and medium-income countries (Staff, 2017). Reports suggest that Mexico is one of the countries most severely affected by this problem, causing enormous losses to the productive sector every year (Celis, 2016). Health professions, particularly the medical practice are also among the most severely affected professions in this country. As mentioned earlier, during the training process, doctors are subjected to constant stress due to having to absorb large amounts of information in a short time and to develop the ability to use it in a timely manner, while at the time working in clinical fields (as in the case of medical residencies in the specialization process). The dual role of worker and student, the multiple lines of communication, and the constant demand for attention in everyday tasks, coupled with long working hours, create the ideal conditions for the development of BOS in this vulnerable population. Nevertheless, probably due to its recent phenomenological description, its incidence, effects on health and job performance, as well as its treatment, continue to be a subject of great interest despite the lack of available information. In Mexico, until recently there were no clear official regulations to protect workers from BOS. Fortunately, since 2018, the NOM-035-STPS-2018 (Norma Oficial Mexicana) on Psychosocial Risk Factors at Work has constituted a good first approach in this regard in regulatory matters. However, its dissemination and effective application are less than optimal in certain areas (Diario Oficial de la Federación, 2018).

The main objectives of this article are to describe the association between burnout syndrome and medical training by specialty in first-year residents at the Fray Antonio Alcalde Guadalajara Civil Hospital, and to identify individual or clinical/academic in-hospital characteristics that could be associated with the presence of BOS.

## METHOD

### Study design

This is a cross-sectional, analytical study.

### Sample description

The study was carried out on first-year medical residents at the Fray Antonio Alcalde Guadalajara Civil Hospital, including a sample of all first-year specialties (therefore excluding sub-specialties, high specialties, and fellowships), in order to have a sample with a more acute exposure to the in-hospital stress to which medical residents are usually exposed.

A non-probabilistic study by consecutive inclusion was conducted, calculating the sample size to estimate the detection of BOS in our population. The sample size was calculated to be 54, using the CDC Epi Info software, based on the study by [Willems et al. \(2018\)](#).

### Place

Subjects were resident doctors in their first year of training as specialists at the Fray Antonio Alcalde Civil Hospital of Guadalajara, the largest public hospital in Western Mexico, which provides medical care for people with no other social security services, meaning that the population that attends this institution is large and predominantly local.

### Measurements

Those who agreed to participate in the study were included. The sociodemographic data of the sample were obtained to subsequently administer the evaluation instrument (Maslach Burnout Inventory). The MBI comprises 22 items assessing three spheres: emotional exhaustion, depersonalization, and personal accomplishment at work. In keeping with the design of the instrument, a case affected by BOS is considered to be a person who scores high on the subscales of emotional exhaustion and depersonalization, ( $\geq 26$  and 9 points respectively) and low on the personal accomplishment subscale ( $\leq 34$  points).

### Procedures

The protocol for this research was submitted to the Sub-directorate of Postgraduate Teaching, requesting the contacts of first-year residents, who were contacted by different means: personalized letters and social network groups (WhatsApp), and invited to the general auditorium of the hospital unit for a brief psychoeducational talk on BOS. The battery of questions in this study was administered after it had been explained and subjects had been asked to give written informed consent. Those who were unable to

answer the questionnaire at that meeting were contacted in person in their respective workplaces.

Data on the study subjects are completely confidential and were only extracted by a physician with standardized psychiatry training in the methods used. These data were extracted and captured using a coded instrument, and subsequently transferred to an electronic database for statistical processing.

### Monitoring

Psychology and Psychiatry consultation services within the Fray Antonio Alcalde Guadalajara Civil Hospital were offered to those study subjects who achieved significant scores in the Burnout Diagnosis.

### Statistical analysis

The normality of the distribution of the quantitative variables of interest was established using the Kolmogorov-Smirnov test. A statistical analysis of free distribution (medians) or parametric (means) was chosen as a function of symmetry. Descriptive statistics were used for quantitative variables and measured with medians and ranges or means, variance, and standard deviation. Proportions were used for the qualitative variables, and confidence intervals (95%) were used to measure accuracy.

For inferential statistics, a comparison of independent samples for two groups was performed using the Mann-Whitney U for ordinal variables, Student's *t* for scalars, and Chi<sup>2</sup> for the dichotomous comparison. The comparative analysis by specialty was undertaken using Kruskal-Wallis and one-factor variance analysis. A value of  $p < .05$  was considered significant. To determine association and correlation, Pearson's  $r^2$  correlation test was used for scalar variables and the Phi correlation coefficient for dichotomous variables.

The study adhered to the STROBE guidelines for observational (cross-sectional) epidemiological studies. Data were processed using the IBM SPSS version 20.0 program for Windows 7; Epidat produced by the Xunta de Galicia and the Pan American Health Organization version 3.1 and Epi Info version 7.0 developed by Atlanta CDC.

### Ethical considerations

This study was evaluated and approved by the Ethics Committee of the Fray Antonio Alcalde Guadalajara Civil Hospital and complied with national and international regulations on ethics in medical research studies.

## RESULTS

Eighty-eight patients were included in the study. There were no losses to follow-up. The Kolmogorov-Smirnov normal-

ity test showed a normal population distribution. The mean age was 26.6 years ( $SD = 1.5$  years). There were slightly more males in the sample ( $n = 45$ , 51.1%), and more clinical ( $n = 45$ , 51.1%) than surgical residents ( $n = 43$ , 48.9%). The most frequent specialty area was Surgery ( $n = 16$ , 18.2%), followed by Pediatrics ( $n = 12$ , 13.6%), Internal Medicine ( $n = 10$ , 11.4%), Anesthesiology and Traumatology and Orthopedics ( $n = 9$ , 10.2% each), Gynecology, Imagenology, Rehabilitation and Ophthalmology ( $n = 5$ , 5.7% each), and lastly Pathological Anatomy, Geriatrics, Genetics, Otolaryngology (ENT), Psychiatry and Medical Emergencies ( $n = 2$ , 2.3% each).

Of the sociodemographic variables of interest, most of the sample reported being single ( $n = 78$ , 88.6%). There were more subjects from Guadalajara than elsewhere ( $n = 51$ , 58% vs.  $n = 37$ , 42%), while most of the sample reported living near the hospital unit ( $n = 58$ , 65.9%). Only 9.1% of the sample had children ( $n = 8$ ). Living with the family was the most common housing arrangement ( $n = 50$ , 56.8%) followed by living with roommates ( $n = 16$ , 18.3%), living alone ( $n = 12$ , 13.6%), and finally only with parents ( $n = 10$ , 11.4%). The average number of people with whom they shared a dwelling was two ( $SD 1.43$ ). A total of 40.9% of the sample reported having additional financial support to the scholarship granted by the medical residency ( $n = 36$ ).

Regarding the variables of interest in the workplace, the average workload per week was 95.2 hours ( $SD 32.1$ ), with a mean load of 48.1 on-call hours per week ( $SD 27$ ) and a mean load duration during a "post-on-call" period of 9.6 hours ( $SD 4.7$ ). The most prevalent on-call schedule was AD ( $n = 46$ , 52.3%), followed by AC ( $n = 17$ , 19.3%), AF ( $n = 11$ , 12.5%), and AE ( $n = 10$ , 11.4%), while, 4.5% reported that they did not performed any on-call shifts.

The mean number of hours of academic activity during the on-call period was 1.7 ( $SD 3.8$ ). The activity most commonly reported as consuming the greatest amount of time in the working day were clinical notes ( $n = 25$ , 28.4%), followed by procedures ( $n = 20$ , 22.7%), rounds ( $n = 19$ , 21.6%), patient interviews ( $n = 13$ , 14.8%), other ( $n = 10$ , 11.4%), and lastly academic activities ( $n = 1$ , 1.1%).

During a typical working day, the average number of hours spent on patient interviews was 4.4 hours ( $SD 4.2$ ), the average number of hours for daily academic activities was 1.7 ( $SD 1.4$ ), the average number of hours spent making clinical notes was 5.4 hours ( $SD 4.2$ ), and, finally, the mean number of hours used for procedures was 4.5 hours ( $SD 4.1$ ).

Regarding intrahospital communication, upward communication was reported as being poor in 35.2% of cases ( $n = 31$ ), followed by good ( $n = 26$ , 29.5%), fair ( $n = 23$ , 26.1%), very poor ( $n = 5$ , 5.7%), and excellent ( $n = 3$ , 3.4%). As for lateral communication, most of the sample reported it as good ( $n = 44$ , 50%), followed by excellent ( $n = 27$ , 30.7%), fair ( $n = 8$ , 9.1%), poor ( $n = 7.8\%$ ), and very poor

( $n = 2$ , 2.3%). In the case of downward communication, most of the sample reported it as good ( $n = 44$ , 50%), followed by excellent ( $n = 27$ , 30.7%), fair ( $n = 8$ , 9.1%), poor ( $n = 7.8\%$ ), and very poor ( $n = 2$ , 2.3%).

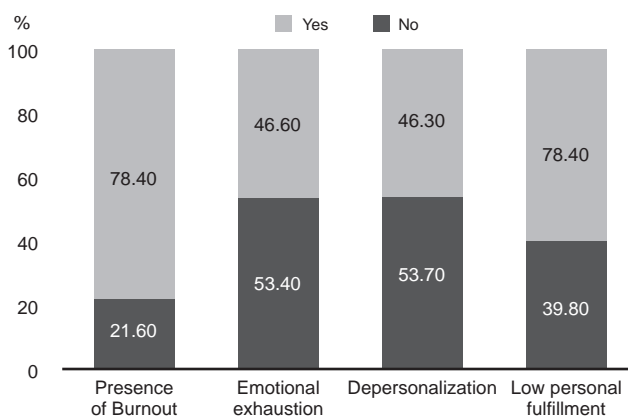
Support from medical personnel was reported as fair in most of the sample ( $n = 29$ , 33%), followed by good ( $n = 26$ , 29.5%), poor ( $n = 23$ , 26.1%), excellent ( $n = 5$ , 5.7%), and very poor ( $n = 5$ , 5.7%). Finally, support from administrative staff was reported as fair ( $n = 32$ , 36.4%), poor ( $n = 26$ , 29.5%), good ( $n = 14$ , 15.9%), very poor ( $n = 12$ , 13.6%), and excellent ( $n = 4$ , 4.5%).

Burnout syndrome was present in 21.6% of the sample ( $n = 19$ ) with the mean score being 71.5 points ( $SD 14.8$ ). A total of 53.4% of the sample displayed emotional exhaustion ( $n = 47$ ) with a mean score of 28.1 ( $SD 10.86$ ), while 53.7% showed depersonalization ( $n = 47$ ) with a mean score of 10 points ( $SD 5.3$ ), and finally 39.8% presented reduced personal accomplishment ( $n = 35$ ) with a mean score of 33.8 points ( $SD 5.8$ ) (Figure 1).

The sample was divided into two groups for analysis based on whether they had burnout syndrome (Table 1).

There were no differences in presenting BOS by sociodemographic characteristics, group, or type of specialty. An association was found between presenting BOS and not receiving financial assistance in addition to the specialty grant ( $ro = .212$ ,  $p = .047$ ). A slight, statistically significant association directly proportional to the size of the workload was found with the presence of BOS ( $ro = .229$ ,  $p = .032$ ). Residents with a workload of over 80 hours were 7.3 times more likely to present burnout than those with a smaller workload ( $RR 7.34$ ,  $CI 95\% [2.1, 58.7]$ ). Moreover, an association was found between residents who were on call for over 48 hours a week and the presence of burnout ( $ro = .34$ ,  $p = .001$ ) (Figures 2 and 3).

There was a statistically significant, slight and directly proportional association between the number of hours in the



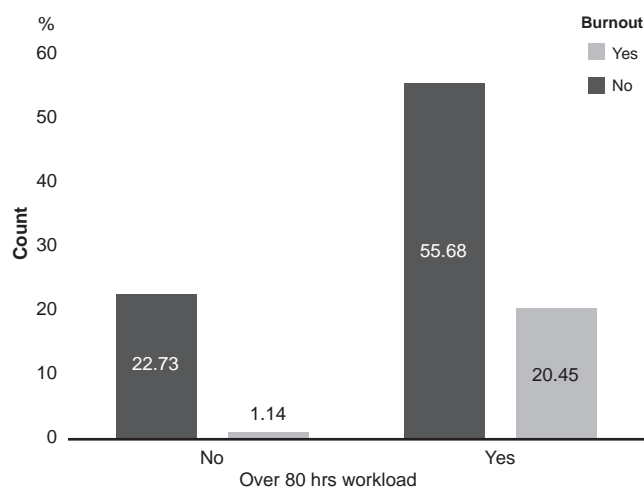
**Figure 1.** Distribution of frequencies of Burnout Syndrome and of the three categories evaluated in the Maslach Burnout Inventory.



Table 1  
Results as a function of the presence or absence of Burnout Syndrome

Variable	Presents Burnout (n = 19)	Does not present Burnout (n = 69)	p	Variable	Presents Burnout (n = 19)	Does not present Burnout (n = 69)	p
Sex, n (%)			.711	"Post-on-call" workload, n (%)			.019
Female	10 (52.6)	33 (47.8)		Over 8 hrs.	18 (94.7)	47 (68.1)	
Male	9 (47.4)	36 (52.2)		Under 8 hrs.	1 (5.3)	22 (31.9)	
Age, mean (SD)	26.9 (1.5)	26.5 (1.6)	.519	On-call schedule, n (%)			.487
Group, n (%)			.883	AC	5 (26.3)	12 (17.4)	
Surgical	9 (47.4)	34 (49.3)		AD	11 (57.9)	35 (50.7)	
Clinical	10 (52.6)	35 (50.7)		AE	2 (10.5)	8 (11.6)	
Specialty, n (%)			.879	AF	1 (5.3)	10 (14.5)	
General Surgery	4 (21.1)	12 (17.4)		No	0 (0)	4 (5.8)	
Gynaecology	2 (10.5)	3 (4.3)		Time available for meals (min), mean (SD)	58.3 (39.1)	67.4 (55.8)	.009
Pediatrics	4 (21.1)	8 (11.6)		Academic workload per on-call shift (hours), mean (SD)	1.1 (0.6)	1.9 (4.3)	.900
Internal Medicine	2 (10.5)	8 (11.6)		Activity that takes up most time, n (%)			.586
Anesthesiology	2 (10.5)	7 (10.1)		Interviews	2 (10.5)	11 (15.9)	
Immunology	1 (5.3)	4 (5.8)		Academic	0 (0)	1 (1.4)	
Ophthalmology	1 (5.3)	4 (5.8)		Notes	5 (26.3)	20 (29)	
Psychiatry	1 (5.3)	1 (1.4)		Rounds	7 (36.8)	12 (17.4)	
Traumatology	1 (5.3)	8 (11.6)		Procedures	3 (15.8)	17 (24.6)	
Emergency Medicine	1 (5.3)	1 (1.4)		Other	2 (10.5)	8 (11.6)	
Pathology	0 (0)	2 (2.9)		Hours/day of interviews, mean (SD)	4.6 (4.1)	4.3 (4.3)	.415
Geriatrics	0 (0)	2 (2.9)		Hours/day of academic activities, mean (SD)	1.4 (1.09)	1.8 (1.5)	.546
Genetics	0 (0)	2 (2.9)		Hours/day of notes, mean (SD)	6.2 (3.4)	5.2 (4.3)	.003
Rehabilitation	0 (0)	2 (2.9)		Hours/day of procedures, mean (SD)	5.1 (3.1)	4.3 (4.4)	.004
ENT	0 (0)	2 (2.9)		Downward communication, n (%)			.014
Origin, n (%)			.596	Excellent	0 (0)	3 (4.3)	
Local	10 (52.6)	41 (59.4)		Good	0 (0)	26 (37.7)	
Elsewhere	9 (47.4)	28 (40.6)		Fair	8 (42.1)	15 (21.7)	
Residence, n (%)			.405	Poor	11 (57.9)	20 (29)	
Near	11 (57.9)	47 (68.1)		Very poor	0 (0)	5 (7.2)	
Far	8 (42.1)	22 (31.9)		Lateral communication, n (%)			.393
Marital status, n (%)			.716	Excellent	5 (26.3)	22 (31.9)	
Single	16 (84.2)	62 (89.9)		Good	9 (47.4)	35 (50.7)	
Married	2 (10.5)	3 (4.3)		Fair	1 (5.3)	7 (10.1)	
Living together	1 (5.3)	3 (4.3)		Poor	4 (21.1)	3 (4.3)	
Divorced	0 (0)	1 (1.4)		Very poor	0 (0)	2 (2.9)	
Children, n (%)			.512	Downward communication, n (%)			.267
No	18 (94.7)	61 (89.9)		Excellent	2 (10.5)	21 (30.4)	
Yes	1 (5.3)	7 (10.1)		Good	13 (68.4)	32 (46.4)	
People, n (%)			.330	Fair	2 (10.5)	13 (18.8)	
Alone	2 (10.5)	10 (14.5)		Poor	2 (10.5)	3 (4.3)	
Parents	1 (5.3)	9 (13)		Very poor	0 (0)	0 (0)	
Family	10 (52.6)	40 (58)		Medical staff support, n (%)			.014
Roommates	6 (31.6)	10 (14.5)		Excellent	0 (0)	5 (7.2)	
Financial support			.047	Good	2 (10.5)	24 (34.8)	
No	15 (78.9)	37 (53.6)		Fair	7 (36.8)	22 (31.9)	
Yes	4 (21.1)	32 (46.4)		Poor	10 (52.6)	13 (18.8)	
Workload, average hours/week (SD)	98.4 (16.9)	94.3 (35.2)	.032	Very poor	0 (0)	5 (7.2)	
Weekly workload, n (%)			.032	Administrative staff support, n (%)			.575
Over 80 hrs.	18 (20.3)	49 (55.3)		Excellent	0 (0)	4 (5.8)	
Under 80 hrs.	1 (1.1)	20 (22.6)		Good	2 (10.5)	12 (17.4)	
On-call workload (hours/week), mean (SD)	56.6 (10.7)	46.4 (29.7)	.001	Fair	9 (47.4)	23 (33.3)	
On-call workload, n (%)			.001	Poor	5 (26.3)	21 (30.4)	
Over 48 hrs.	19 (100)	43 (62.3)		Very poor	3 (15.8)	9 (13)	
Under 48 hrs.	0 (0)	26 (37.7)					
"Post-on-call" (hours/period), mean (SD)	10.1 (2.5)	9.51 (5.1)	.019				

Note: SD = Standard deviation; ORL = Otolaryngology.

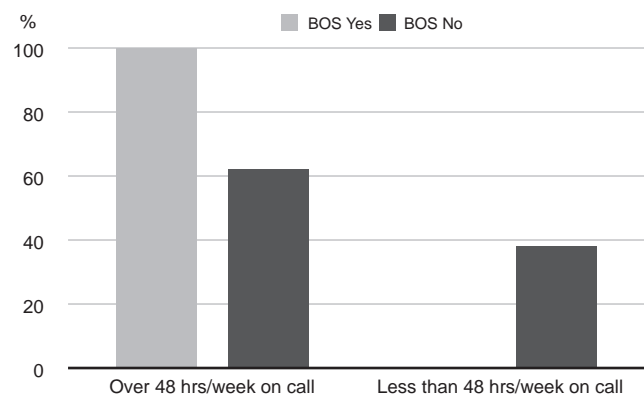


**Figure 2.** Incidence of BOS in relation to workload per week.

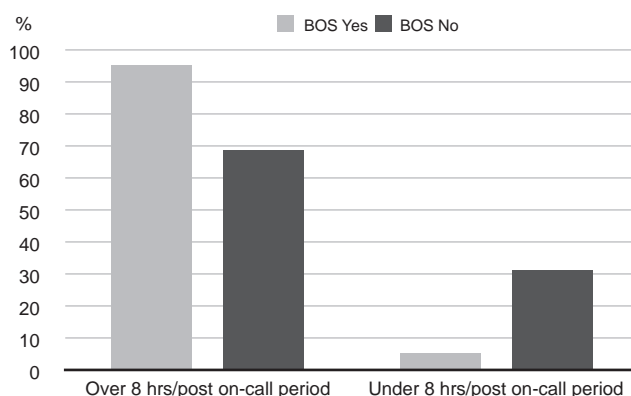
“post-on-call” period and the presence of burnout ( $r = .249$ ,  $p = .019$ ). Residents with more than eight “post-on-call” hours were 8.4 times more likely to present burnout than those with fewer hours (RR 8.42; 95% CI [2.4, 67.1]) (Figure 4).

Residents with fewer than 60 minutes a day for meals were four times more likely to present burnout compared to the rest (RR 4.06; 95% CI [2.1, 12.04],  $p = .009$ ). Regarding work activities, an association was observed between the number of hours spent on notes and the presence of BOS ( $r = .319$ ,  $p = .003$ ). Residents who spent more hours on their notes were 13 times more likely to have BOS than those who spent fewer hours on this task (RR 13.05; 95% CI [2.01, 103.3]).

Moreover, a statistically significant association was observed between the number of hours spent on procedures and the presence of BOS ( $r = .303$ ,  $p = .004$ ). Residents who spent over two hours a day on procedures were 7.3 times more likely to have BOS than those who spent fewer hours on this (RR 7.3; 95% CI [1.99, 34.2]).



**Figure 3.** Incidence of BOS in relation to weekly on-call schedule.



**Figure 4.** Incidence of BOS in relation to schedule for each post-on-call period.

Emotional exhaustion was statistically significantly associated with the length of time of being on-call ( $p = .001$ ). The presence of depersonalization was also significantly associated with the length of time of being on call ( $p = .022$ ), time for eating ( $p = .013$ ), and hours spent on notes ( $p = .024$ ). At the same time, there were differences in reduced personal accomplishment between residents with and without additional financial support ( $p = .056$ ) and the number of hours spent on procedures ( $p = .043$ ). The perceived quality of upward communication ( $z = -1.953$ ,  $p = .050$ ) and medical support ( $z = -2.167$ ,  $p = .030$ ) is different among residents who presented exhaustion.

## DISCUSSION AND CONCLUSION

The research shows that the prevalence of BOS in first-year residents at the Fray Antonio Alcalde Guadalajara Civil Hospital varies between each of the specialties, with a higher frequency of cases occurring in Pediatrics and General Surgery services. However, no significant association was found with the group or type of specialty, unlike what has been reported in other studies. The high incidence of BOS (66%) in both services is striking. This phenomenon could be explained by the teaching style used and the way medical practice is carried out: 1. These are services with a high caseload, requiring long working days, with fewer care personnel than is usually required; 2. Traditional medical education systems tend to be rigid and hierarchical, fostering communication styles that easily turn into workplace bullying and harassment. It would be important to replicate similar studies both in the specialties identified with high BOS rates and the others, and to identify the characteristics that might be responsible for this maladaptive response.

Despite the fact that the total incidence of BOS within the sample (which, as previously noted, includes physicians about to complete their first year of residency) does not include most of the participants, it is still relevant and sig-

nificant, particularly if a separate analysis is conducted of each of the categories, in which over half the sample scores high on the “Emotional exhaustion” and “Depersonalization” sections. It is worth mentioning the fact that since the instruments used are self-reports, this could skew results, creating responses that underestimate the absolute value of the MBI. Many of the factors associated with the development of symptoms of illness due to BOS which appear both in the literature already discussed and in these results are related to the organizational climate and workloads. Mexican regulations establish clear parameters, although they are still far from those suggested by equivalent systems in other countries. However, for whatever reasons, there are still cases where these guidelines are not followed.

A study such as this one creates new knowledge that acts as a situational diagnosis of the work stress conditions affecting medical residents who perform their work at the institution. It helps determine the scope of the problem and encourages one to consider possible factors that contribute to its origin and maintenance. This information also sets a precedent for formulating various action plans, whose impact on the mental health and well-being of the population affected could subsequently be compared. BOS must be prevented. However, it is also necessary to promote and establish remedial measures for existing conditions, which may have repercussions on the training institutions and the patients themselves.

It is also clear that it is feasible to conduct this type of evaluation in a structured way as a mechanism for monitoring working conditions. It is essential to design and implement intervention programs for BOS prevention and management.

The main limitations identified by the authors are related to the possible biases due to the self-applicable nature of the MBI, which may under-estimate symptoms. Moreover, variations in the number of participants by specialty make it difficult to establish more robust associations between them.

Data for certain first-year residents could not be included, mainly due to external rotations and vacation periods.

## Funding

None.

## Conflicts of interest

The authors declare they have no conflicts of interest.

## REFERENCES

- Acosta-Fernández, M., Aguilera-Velasco, M. A., & Pozos-Radillo, B. E. (2017). *Determinaciones sociales en el sistema de salud mexicano. Repercusiones y afectaciones en la salud de médicos residentes*. México: Sindicato de Trabajadores Académicos de la Universidad de Guadalajara.
- Celis, F. (2016, May 05). Estrés ocasiona pérdidas por 16,000 mdp a empresas mexicanas. *Forbes México*. Retrieved from <https://www.forbes.com.mx/estres-ocasiona-perdidas-16000-mdp-empresas-mexicanas/> (Access date August 21, 2018).
- Diario Oficial de la Federación. (2018, Oct 10). *Norma Oficial Mexicana NOM-035-STPS-2018, Factores de riesgo psicosocial en el trabajo-Identificación, análisis y prevención*. México: Secretaría de Gobernación. Retrieved from [https://www.dof.gob.mx/nota\\_detalle.php?codigo=5541828&fecha=23/10/2018](https://www.dof.gob.mx/nota_detalle.php?codigo=5541828&fecha=23/10/2018) (Access date June 21, 2019).
- El Universal, JADF. (2015, May 17). México, primer lugar en estrés laboral: OMS. *El Universal, México*. Retrieved from <https://www.eluniversal.com.mx/articulo/nacion/sociedad/2015/05/17/mexico-primer-lugar-en-estres-laboral-oms> (Access date April 16, 2019).
- Gajewski, P. D., Boden, S., Freude, G., Potter, G. G., & Falkenstein, M. (2017). Burnout is associated with changes in error and feedback processing. *Biological Psychology*, 129, 349-358. doi: 10.1016/j.biopsycho.2017.09.009
- Gutiérrez Aceves, G. A., Celis López, M. A., Moreno Jiménez, S., Farias Serratos, F., & Suárez Campos, J. J. (2006). Síndrome de burnout. *Archivos de Neurociencias*, 11(4), 305-309.
- Heinze-Martin, G., Olmedo-Canchola, V. H., Bazán-Miranda, G., Bernard-Fuentes, N. A., & Guízar-Sánchez, D. P. (2018). Medical specialists in Mexico. *Gaceta Médica de México*, 154(3), 342-351.
- Juárez-García, A., Idrovo, Á. J., Camacho-Ávila, A., & Placencia-Reyes, O. (2014). Síndrome de burnout en población mexicana: Una revisión sistemática. *Salud Mental*, 37(2), 159-176.
- Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Organizational Behavior*, 2(2), 99-113. doi: 10.1002/job.4030020205
- Olivares-Faúndez, V., Mena-Miranda, L., Jélvez-Wilker, C., & Macía-Sepúlveda, F. (2014). Validez factorial del Maslach Burnout Inventory Human Services (MBI-HSS) en profesionales chilenos. *Universitas Psychologica*, 13(1), 145-160.
- Staff, F. (2017, December 21). Mexicanos, los más estresados del mundo por su trabajo. *Forbes México*. Retrieved from <https://www.forbes.com.mx/mexicanos-los-mas-estresados-del-mundo-por-su-trabajo/>
- Willems, R., Monten, C., & Portzky, G. (2018). Exploring the relative importance of work-organizational burnout risk factors in Belgian residents. *Medical Education Online*, 23(1), 1521246. doi: 10.1080/10872981.2018.1521246