Burnout in Orthopedic Trauma Specialists

Burnout en especialistas de Ortopedia y Traumatología

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Abstract

Introduction The burnout syndrome has been described as a group of symptoms related to emotional exhaustion, depersonalization, and lack of a sense of personal accomplishment. A prevalence ranging from 4% to 59.4% has been described among orthopedic trauma specialists. The objective of the present study is to evaluate the prevalence of burnout in its domains and associated factors in orthopedic trauma specialists in Chile.

Materials and Methods Specialists registered in the Chilean Congress in 2016 were invited. The burnout syndrome was evaluated with the Maslach Burnout Inventory. Numerical and categorical variables were described, and the burnout was analyzed according to its domains and associated variables. Values of $p < 0.05$ were considered statistically significant. The present project was approved by the Institutional Scientific Ethics Committee.

Results The survey was filled out by 99 surgeons. The median age was of 45 (range: 29–76) years, and 92% (n = 85) of them were male. A total of 21% scored high on the emotional exhaustion domain, 20%, high on depersonalization, and 6%, low on personal accomplishment. Overall, 35% of the physicians scored above the clinical cut-offs indicating burnout. Sleeping less than 5 hours and the use of modafinil were significantly associated with the presence of burnout.

Conclusion Defined as the alteration of at least one domain, burnout was found in 35% of the sample. Future studies should seek prevention based on modifiable risk factors.

Keywords
- orthopedics and traumatology
- surgeons
- burnout
- surgical specialty

Resumen

Introducción El síndrome de *burnout* fue descrito como un conjunto de síntomas relacionados a cansancio emocional, despersonalización y falta de realización personal. En especialistas de Ortopedia y Traumatología, se ha descrito una prevalencia entre 4%

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y 59,4%. El objetivo de este estudio es evaluar, en especialistas de Ortopedia y Traumatología en Chile, la prevalencia de *burnout* en sus dimensiones y sus factores asociados.

Materiales y Métodos Se invitó a participar a los especialistas inscritos al Congreso Chileno el año 2016. Se evaluó el síndrome de *burnout* con el cuestionario Maslach Burnout Inventory. Se describieron las variables numéricas y categóricas, y se analizó el *burnout* según sus dimensiones y variables asociadas. Se consideró la significancia estadística con valores de $p < 0,05$. Este proyecto fue aprobado por el Comité de Ética Científica Institucional.

Resultados Se obtuvo la respuesta de la encuesta completa de 99 traumatólogos. La mediana de edad fue de 45 (rango: 29–76) años, y el 92% (n = 85) era del sexo masculino. Un 21% presentó un alto puntaje en la dimensión cansancio emocional, 20%, en despersonalización, y un 6% tenía alteración en la dimensión de realización personal. En la muestra total, un 35% presentó *burnout*. Las variables que se asociaron significativamente con la presencia de *burnout* fueron dormir menos de 5 horas y el consumo de modafinilo.

Conclusión En este estudio se encontró una prevalencia de 35% de *burnout*, definido como la alteración de al menos una de las dimensiones. Futuros estudios deberán indagar en la prevención a partir de los factores de riesgo modificables.

Palabras clave
- ortopedia y traumatología
- cirujanos
- burnout
- especialidad quirúrgica

Introduction

Symptoms of depression, dissatisfaction, an imbalance between work and personal life, exhaustion, and burnout occur throughout all stages of medical education and different specialties.[1] The burnout syndrome was described at the beginning of the 1980s as a set of symptoms affecting 3 mental health areas or domains: emotional exhaustion, depersonalization, and lack of personal accomplishment.[2] Burnout increases medical errors, hinders relationships with peers, alters the work environment, and decreases productivity. All these changes negatively affect the health of the patients.[3,4]

The prevalence of burnout among orthopedic and traumatology specialists ranges from 4% to 59.4% in different studies, depending on the population analyzed.[5] In teaching environments, burnout is more frequent in residents than in clinical specialists, students, or both.[6,7] Emotional exhaustion and depersonalization are the most common symptoms in the orthopedic and traumatology, and their occurrence is also higher compared with other surgical specialties.[5] Factors such as anxiety concerning clinical competence, the growing number of orthopedic surgeons, financial obligations, and imbalance between work and personal life contribute to burnout.[7,8]

Knowing the prevalence of burnout is critical because of the possibility of intervening in modifiable related factors. In Chile, the burnout rate among orthopedists and traumatologists is 53.7% per self-reporting with nonstandardized tools.[9] The present study aims to evaluate the prevalence of burnout in its domains and associated factors in orthopedics and traumatology specialists in Chile.

Material and Methods

This is an analytical cross-sectional study. All orthopedics and traumatology specialists registered at the 2016 Chilean Congress of Orthopedics and Traumatology were invited to participate. We excluded general practitioners, residents, and other healthcare professionals. We sent an online survey via institutional e-mail for anonymous responses. A multiple-choice questionnaire assessed sociodemographic data, including age, gender, body mass index (BMI), drug use, modafinil use, geographic region of origin, physical activity, the weekly number of working hours, marital status, number of children, and weekly time spent with a partner. The validated questionnaire Maslach Burnout Inventory: Human Services Survey for Medical Personnel (MBI-HSS [MP]) was used to evaluate the burnout syndrome.

MBI-SS Instrument

The MBI-HSS (MP) instrument includes 22 Likert-type response questions (scored from 0 to 6). It measures emotional exhaustion (EE), depersonalization (DP), and personal accomplishment (PA), classifying each domain as low, medium, or high per score. The diagnosis of burnout requires an EE score > 26 points (9 questions, maximum score of 54), a DP score > 9 points (5 questions, maximum score of 30), or a PA score < 34 points (eight questions, maximum score of 48) (►**Table 1**).

Statistical analysis

The description of numerical variables used central tendency and dispersion with median and range values. Categorical variables were described as relative and absolute frequencies

Table 1 Scores according to the domains of the Maslach Burnout Inventory: Human Services Survey for Medical Personnel

Domain	Low	Medium	High
Emotional exhaustion	0–18	19–26	**27–54**
Depersonalization	0–5	6–9	**10–30**
Personal accomplishment	**0–33**	34–39	40–48

Note: Values in bold indicate burnout.

and were analyzed using the chi-squared test or the Fisher exact test, as appropriate. The Mann-Whitney and Kruskal-Wallis tests determined the association between numerical and categorical variables. Statistical significance was set as a p-value < 0.05. Statistical analysis was performed with STATA version 14 software (StataCorp LLC, College Station, TX, United States).

The Scientific Ethics Committee of the Faculdade de Medicina of the Pontificia Universidad Católica de Chile (no. 16-226) and the director board of the Chilean Society of Orthopedics and Traumatology approved the present study.

Results

General features

The survey was filled out by 99 traumatologists. The median age was of 45 (range: 29–76) years, and 92% ($n = 85$) of the participants were males. All (100%) were graduated specialists, actively working, with a median of 50 (range: 11–80) working hours per week. Among the participants, 58% were overweight and 11% were obese. The prevalence of overweight was significantly different according to gender (61.5% of overweight males versus 12.5% of overweight females; $p < 0.05$). Eighty-five percent stated they were married; 7% were separated or divorced, and 92% (91) had ≥ 1 child. In total, 63% performed physical activity regularly, with significant differences according to age (median ages for inactive and active subjects were 50 and 44 years, respectively; $p = 0.006$) (►**Table 2**)

Table 2 Description of the study sample

Variable	*n* (%)
Gender	
Female	8 (8%)
Male	91 (92%)
Age in years: median (range)	45 (29–76)
Body mass index	
Normal	31 (31%)
Overweight	57 (58%)
Obesity	11 (11%)
Marital status	
Single	8 (8%)
Married	84 (84%)
Divorced/separated	7 (7%)
Children	
Yes	91 (92%)
No	8 (8%)
Weekly working hours: median (range)	50 (11–80)
Daily hours of sleep: median (range)	6 (3–8)
Modafinil use	
Yes	3 (3%)
No	96 (97%)
Physical activity	
Yes	62 (63%)
No	37 (37%)

Burnout and associated variables

We categorized the proportion of burnout in its three domains according to the cutoff score described. In total, 21% presented a high EE score, 20% had a high DP score, and 6% reported a low PA score (►**Figure 1**). Burnout was present in 35% of the total sample (alteration in at least 1 domain), and 6% had abnormalities in all 3 domains. The variables significantly associated with burnout were lack of sleep (56% of burnout in those sleeping < 5 hours a day versus 30% in those sleeping more; $p = 0.03$), and modafinil use (100% in those who use it versus 32% in those who did not use it; $p = 0.04$). There was no association of burnout with the other variables studied (►**Table 3**).

Emotional exhaustion

Overall, 21% (21 subjects) of the sample presented a high EE score, with no differences according to age or gender. There was an association with the hours of sleep, with a four-fold chance of EE in those sleeping ≤ 5 hours (odds ratio [OR]: 4.2; 95% confidence interval [95%CI]: 1.3–12.6). The time spent with a partner was associated with a low EE score (median: 2 [range: 1–4] hours in those with EE compared to 3 [range: 0–5] hours in those without EE; $p = 0.02$). Finally, there was an association with modafinil use, with a 100% prevalence of EE in those who consumed it versus 19% in those who did not ($p < 0.01$).

Depersonalization

The DP domain of burnout was present in 20% of the sample, with a higher prevalence in younger traumatologists (median age: 39 [range: 29–63] years versus 47 [range: 31–76] years; $p = 0.02$). On the other hand, specialists with children had a 79% lower chance of suffering from DP, and maternity or paternity was a protective factor (OR: 0.21 [95%CI: 0.04–0.9]).

Personal accomplishment

Low PA scores were observed in 6% of the traumatologists, while 18% had a medium PA score. A higher number of working hours was associated with low PA (median: 57.5 [range: 50–70] hours versus 50 [range: 29–63] hours;

Table 3 Burnout rate per the variables analyzed

Variable		Burnout rate (%)*	Subjects (*n*)	*p-value*
Gender	Female	25	2	0.71
	Male	35	32	
Children	No	62	5	0.12
	Yes	32	29	
Daily hours of sleep	> 5	30	24	**0.03**
	≤ 5	56	10	
Weekly working hours	≤ 44	23	7	0.13
	> 44	39	27	
Modafinil use	No	32	31	**0.04**
	Yes	100	3	
Physical activity	No	35	13	0.89
	Yes	33	21	
Body mass index	Normal	23	7	0.07
	Overweight	44	25	
	Obesity	18	2	
Marital status	Single	50	4	0.61
	Married	33	28	
	Separated/ Divorced	29	2	

Note: *Burnout rate measured as alteration of one or more domains.

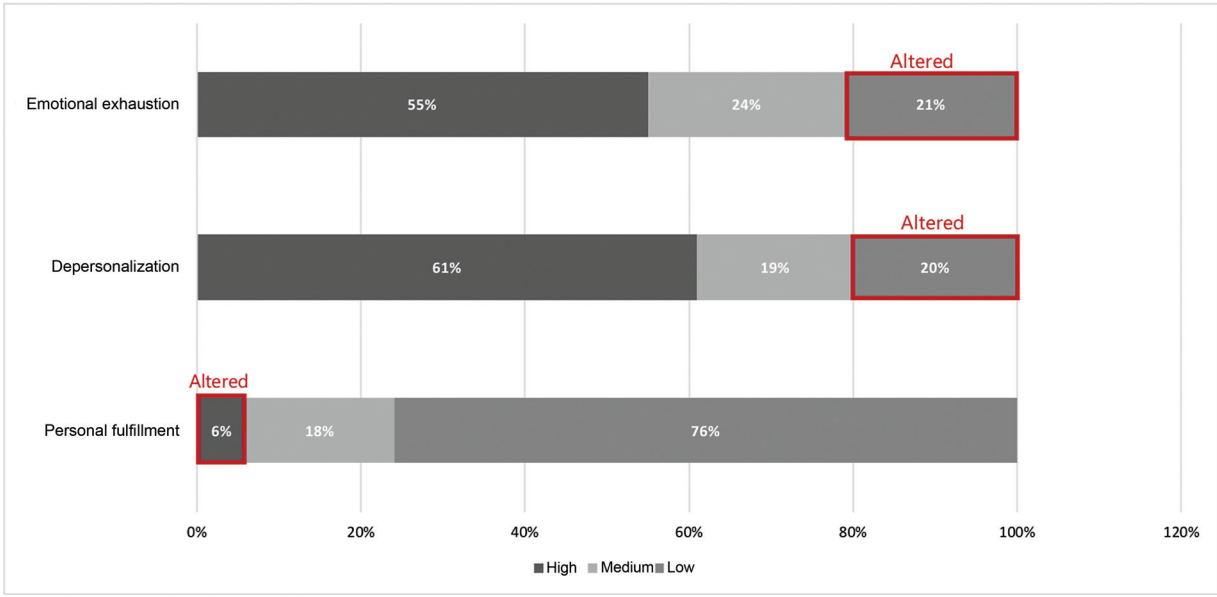

Fig. 1

$p = 0.03$). There were no differences in gender, age, or the remaining variables.

Discussion

In recent years, the medical literature reported high rates of burnout.[10] In our study, 35% of the sample presented burnout (alteration in at least 1 of 3 domains). Shanafelt et al.[4] reported a burnout rate of 45.8% in United States physicians in 2012, a percentage that increased to 54.5% in 2014. For Orthopedics and Traumatology, the burnout prevalence varies according to the population, the study methodology, and the measurement tools used. Regarding its characteristic symptoms, the reported prevalence ranges from 16.2% to 50.7% for EE, 11.4% to 59.4% for DP, and 10% to 33.3% for PA.[5,6]

Different variables are associated with burnout. In the present study, we found that modafinil use and a decrease in sleeping hours were the main factors for altering at least one domain. It has been reported that sleep deprivation[7] and long working hours,[11] both for residents and specialists, are associated with burnout. These variables had the same association with EE and PA in the present study. On the other hand, three specialists reported using modafinil, and 100% had burnout. A study carried out in Chile with medical students showed that the use of this drug also predisposed to a worse quality of life.[12]

In contrast, burnout prevalence is higher in women, either orthopedic surgeons or from other surgical specialties.[13–16] However, our study found no significant differences according to gender. It is important to consider that only 8% of the sample (8 subjects) were female, so there is probably a lack of sample size to associate gender with burnout and other variables (the post hoc analysis yielded a low value, of 6.6%, for this association).

As for protective factors, time spent with a partner and parenthood were relevant in the literature.[8,17] We found that they were independently associated with EE and DP, respectively, reflecting the importance of social factors for welfare protection.

One of the main limitations of the present study is the response rate for this questionnaire, of 30% (99 responses). This rate could induce a measurement bias, over or underestimating the proportion of burnout. In contrast, when measuring variables such as physical activity and BMI, we did not use standardized tools but open questions (*Do you practice any sport or physical activity? What is your height? What is your weight?*), maybe resulting in information bias.

On the other hand, the main strength of the study is the completion of the MBI-HSS (MP) questionnaire for burnout evaluation. This questionnaire has been validated in different populations and contexts in Chile. It is widely used today in the medical field.[18–22] Previous publications in Chile were based on the report of burnout from independent questions[9] (frequency of burnout sensation and insensitivity with third parties). The use of an unvalidated tool can lead to erroneous conclusions in the measurement of a phenomenon.

Burnout prevention and treatment remain a challenge for the medical community. Although recent studies have described effective therapies, the focus must continue on preventive strategies, especially risk-increasing modifiable factors and the promotion of protective factors, and the early detection of the condition. We need to promote and implement these strategies at individual and institutional levels.

Conclusion

The present study found a burnout prevalence of 35%, defined as the alteration of at least 1 domain (EE, DP, and PA) of the MBI-HSS (MP) questionnaire. Sleep deprivation and modafinil use were significantly associated with an increased risk of burnout. Future studies should investigate prevention based on modifiable risk factors.

Conflict of Interests

The authors have no conflict of interests to declare.

References

1 Ames SE, Cowan JB, Kenter K, Emery S, Halsey D. Burnout in Orthopaedic Surgeons: A Challenge for Leaders, Learners, and Colleagues: AOA Critical Issues. J Bone Joint Surg Am 2017;99(14):e78
2 Maslach C, Jackson SE. Maslach Burnout Inventory. Research Edition. Palo Alto, CA: Consulting Psychologists Press; 1981
3 Maslach C, Schaufeli WB, Leiter MP. Job burnout. Annu Rev Psychol 2001;52(01):397–422
4 Shanafelt TD, Balch CM, Bechamps G, et al. Burnout and medical errors among American surgeons. Ann Surg 2010;251(06):995–1000
5 Hui RWH, Leung KC, Ge S, et al. Burnout in orthopaedic surgeons: A systematic review. J Clin Orthop Trauma 2019;10(Suppl 1):S47–S52
6 Arora M, Diwan AD, Harris IA. Burnout in orthopaedic surgeons: a review. ANZ J Surg 2013;83(7-8):512–515
7 Sargent MC, Sotile W, Sotile MO, Rubash H, Barrack RL. Quality of life during orthopaedic training and academic practice. Part 1: orthopaedic surgery residents and faculty. J Bone Joint Surg Am 2009;91(10):2395–2405
8 Sargent MC, Sotile W, Sotile MO, Rubash H, Barrack RL. Stress and coping among orthopaedic surgery residents and faculty. J Bone Joint Surg Am 2004;86(07):1579–1586
9 Vaisman A, Guiloff R, Contreras M, Delgado I, Calvo R, Figueroa F, et al. Burnout y calidad de vida en traumatólogos chilenos: ¿Estamos realmente bien? Rev Chil Ortop Traumatol 2020;61(03):76–82
10 Bartholomew AJ, Houk AK, Pulcrano M, et al. Meta-Analysis of Surgeon Burnout Syndrome and Specialty Differences. J Surg Educ 2018;75(05):1256–1263
11 Saleh KJ, Quick JC, Conaway M, et al. The prevalence and severity of burnout among academic orthopaedic departmental leaders. J Bone Joint Surg Am 2007;89(04):896–903
12 Irribarra T L, Mery I P, Lira S MJ, Campos D M, González L F, Irarrázaval D S. ¿Cómo es la calidad de vida reportada por los estudiantes de Medicina? Rev Med Chil 2018;146(11):1294–1303
13 Fletcher AM, Pagedar N, Smith RJH. Factors correlating with burnout in practicing otolaryngologists. Otolaryngol Head Neck Surg 2012;146(02):234–239
14 Gabbe SG, Melville J, Mandel L, Walker E. Burnout in chairs of obstetrics and gynecology: diagnosis, treatment, and prevention. Am J Obstet Gynecol 2002;186(04):601–612
15 Promecene PA, Monga M. Occupational stress among obstetrician/gynecologists. South Med J 2003;96(12):1187–1189
16 Rohrich RJ, McGrath MH, Lawrence TWASPS Plastic Surgery Workforce Task Force and AAMC Center for Workforce Studies. Plastic surgeons over 50: practice patterns, satisfaction, and retirement plans. Plast Reconstr Surg 2008;121(04): 1458–1474
17 van Wulfften Palthe ODR, Neuhaus V, Janssen SJ, Guitton TG, Ring DScience of Variation Group. Among Musculoskeletal Surgeons, Job Dissatisfaction Is Associated With Burnout. Clin Orthop Relat Res 2016;474(08):1857–1863
18 Faye-Dumanget C, Carré J, Le Borgne M, Boudoukha PAH. French validation of the Maslach Burnout Inventory-Student Survey (MBI-SS). J Eval Clin Pract 2017;23(06):1247–1251
19 Gil-Monte PR, Olivares Faúndez VE. Psychometric properties of the "Spanish Burnout Inventory" in Chilean professionals working to physical disabled people. Span J Psychol 2011;14(01): 441–451

20 Olivares-Faúndez V, Mena-Miranda L, Macía-Sepúlveda F, Jélvez-Wilke C. Validez factorial del Maslach Burnout Inventory Human Services (MBI-HSS) en profesionales chilenos. Univ Psychol. 2014; 13(01):145–160

21 Pando Moreno M, Aranda Beltrán C, López Palomar Mdel RValidez factorial del Maslach Burnout Inventory-General Survey en ocho países Latinoamericanos. Cienc Trab 2015;17(52): 28–31

22 Pérez-Fuentes MC, Molero Jurado MM, Simón Márquez MM, Oropesa Ruiz NF, Gázquez Linares JJ. Validation of the Maslach Burnout Inventory-Student Survey in Spanish adolescents. Psicothema 2020;32(03):444–451

