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Original Research

Over 50% of self-reported burnout among Latin American orthopaedic surgeons: A cross-sectional survey on prevalence and risk factors

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ABSTRACT

Objective: Assess the prevalence of self-reported burnout and identify risk and protective factors based on demographic and life quality aspects, among Latin American orthopaedic surgeons.
Methods: This study employed a cross-sectional analytical design. An original design survey was developed using multiple-choice and Likert-scale questions to gather self-reported burnout, demographic, work-related, social, personal, and mood-related data. The survey was electronically distributed to the Chilean Orthopaedic Surgery Society and the Latin American Society of Arthroscopy, Knee Surgery, and Sports Medicine members. Statistical analysis included Chi-square and Fisher's exact tests to determine associations between self-reported burnout and other variables. Subsequently, a multivariate logistic regression was carried out to identify key risk and protective factors ($p < 0.05$).
Results: The survey's response rate was 20 % ($n = 358$) out of the 1779 invitations that were sent. The most representative age range was 41–60 years (50 %) and 94 % were men. Of those surveyed, 50 % reported a burnout episode more than once per year, 60 % depersonalization when treating patients at least yearly, 13 % anhedonia, 11 % a depressive mood more than half of the month or almost every day, and 61 % weariness at the end of a working day. Burnout was statistically associated with age under 40 years old ($p = 0.012$), fewer years as a specialist ($p = 0.037$), fear of lawsuits ($p < 0.001$), a non-healthy diet ($p = 0.003$), non-doing recreational activities ($p = 0.004$), depersonalization when treating their patients ($p < 0.001$), weariness ($p < 0.001$), anhedonia ($p < 0.001$), depressive mood ($p < 0.001$), and career dissatisfaction ($p < 0.001$). The logistic regression demonstrated that fear of lawsuits ($p < 0.001$), weariness at the end of a workday ($p = 0.016$), and anhedonia ($p = 0.019$) were those variables with stronger direct associations with self-reported burnout. A healthy diet was the strongest protective variable ($p < 0.001$).
Conclusion: Over 50 % of the Latin American orthopaedic surgeons who participated in the survey reported experiencing burnout episodes more than once a year, along with depersonalization when treating their patients at least once a year. Additionally, nearly 10 % of respondents experienced weekly depressive symptoms. Among the noteworthy risk factors for self-reported burnout were fear of lawsuits, weariness at the end of the workday, and anhedonia. Conversely, maintaining a healthy diet emerged as the most potent protective factor.
Level of evidence: Level III.

What are the new findings

- Over 50 % of the Latin American orthopaedic surgeons who participated in the survey reported burnout episodes and depersonalization when treating their patients more than once and at least once a year, respectively.
- Nearly 10 % of Latin American orthopaedic surgeons who participated in the survey experienced depressive symptoms weekly.
- Fear of lawsuits, weariness at the end of a working day, and anhedonia are the most significant risk factors for self-reported burnout.
- A healthy diet is the strongest protective factor for self-reported burnout.

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Introduction

Burnout, often referred to as job-related exhaustion, has evolved over the 20th century under various names, such as pressure, stress, work overload, or collapse [1]. Originally outlined by Maslach, it constitutes a syndrome with three dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment [2]. While not classified as a medical condition, burnout syndrome carries substantial economic and societal consequences, sharing similarities with other mental conditions like depression and sleep disorders [1,3]. Recognizing its impact, the World Health Organization (WHO) has recently incorporated burnout into the International Classification of Diseases (ICD-11) as an occupational-related issue affecting overall health. The updated definition by the WHO portrays it as a "syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed" [4].

Among healthcare professionals, burnout has been associated with reduced patient care quality [5]. The prevalence of burnout is rising globally, with rates varying based on factors such as location, occupation, and assessment methods. The ongoing COVID-19 pandemic has amplified psychological strain among healthcare workers due to patient overload, resulting in reported burnout rates of up to 80 % [6]. Even prior to the pandemic, physicians, especially in surgical areas, exhibited elevated burnout rates. This phenomenon is attributed to a variety of factors such as compulsive tendencies, guilt feelings, denial to acknowledge personal vulnerability, and a perfectionism working culture [7,8]. In the United States (US), surgeons have reported a burnout rate of nearly 50 %, which has escalated by 10 % in recent years [1,9,10]. Worryingly, reports indicate higher suicide rates among surgeons than other professions [1], with research establishing a direct link between burnout and suicidal thoughts [11–13].

The causes of burnout in surgical specialities differ and shift based on geographical regions. In China, a primary factor is the combination of a heavy workload and low salaries, while in the US, the concern is primarily related to the risk of medical lawsuits [1].

While studies in Spain and Latin America have examined burnout and its associated factors among physicians [14], the majority of the literature originates from Asian, European, and North American countries. Remarkably, despite orthopaedic surgeons being considered a high-risk group [13], limited research addresses this phenomenon within the Latin American population.

This study aims to assess the prevalence of self-reported burnout and identify risk and protective factors based on demographic and life quality aspects among Latin American orthopaedic surgeons.

Materials and methods

Population and study protocol

A cross-sectional analytical study was conducted in July 2019. An anonymous and voluntary survey was disseminated via email invitations to 1779 orthopaedic surgeons who were members of the Chilean Society of Orthopaedics and Trauma Surgeons and the Latin American Society of Arthroscopy, Knee, and Sports Orthopaedic Surgery. Residents and fellows were excluded from the study. The invitations were sent out on a weekly basis for duration of two weeks, and the submission process was then closed.

The survey was created using Google Drive-Forms (Google LLC, Collaborative software Web survey, 2008) and comprised twenty-nine questions, incorporating multiple-choice, dichotomic, and Likert-scale items to quantify agreement levels with respective statements [15]. These questions were categorized into five sections: demographic, work-related, social, personal, and mood-related variables. The formulation and selection of these questions occurred through consultation with a focus group composed of three orthopaedic surgeons and one biostatistician, aiming to develop a survey that was contextually relevant, inclusive, and user-friendly. Adapted from the official Maslach Burnout Inventory (MBI) [2], which has undergone translation and validation in Spanish, as well as adaptation for professional contexts [16], three questions, one from each domain, were selected to address the subjective experience of burnout during work (Emotional Exhaustion Domain), depersonalization when treating patients (objectifying them or lacking concern for their well-being) (Depersonalization Domain), and career satisfaction (Personal Accomplishment Domain). These inquiries were presented as multiple-choice queries regarding the frequency of burnout sensation and depersonalization. The survey mitigated ascertainment bias, assessing participants' life quality without explicitly mentioning burnout as the core objective when distributing for participation. To access the survey, please refer to the supplementary material.

Data collection

Survey responses were collected and processed in an Excel database (Microsoft Excel®, Microsoft 365, MSO, 2019, Microsoft).

Statistical analysis

The question regarding burnout subjective sensation was selected as the primary outcome for analysis. A positive response for self-reported burnout was categorized when participants reported experiencing more than one episode per year. For Likert-scale questions, a positive response was considered when participants indicated agreement or strong agreement with the statement. The association between self-reported burnout and the variables under study was assessed using Chi-square tests for normally distributed data and Fisher's exact tests for non-normally distributed data. Additionally, Bonferroni post-hoc subgroup analyses were conducted as needed. Subsequently, a multivariate logistic regression analysis was performed to explore the relationship between self-reported burnout and the most significant variables identified in the previous statistical analysis. Their odds ratio values were used to categorize them into risk or protective factors. The questions related to depersonalization when treating patients and career dissatisfaction were excluded from the logistic regression due to their recognition as integral components of the burnout syndrome. However, their association with self-reported burnout was utilized for validation purposes, given the expected strong association. No data imputation or interim analyses were carried out in this study. Data analysis was performed using SPSS (IBM® Statistics for Windows, V. 24, 2016). Statistical significance was defined as $p < 0.05$, and this threshold was adjusted for Bonferroni post-hoc correction according to the number of comparisons made.

Ethics

The study was evaluated and approved by the authors' institutional ethics committee, and data anonymization was assured to all participants.

Results

The response rate was 20 % among the 1779 invited orthopaedic surgeons, yielding a total of 358 participants from 20 Latin American countries.

Demographic, work-related, social, personal, and mood-related responses are summarized in Table 1, which includes self-reported burnout frequencies across each studied variable. Among the 358 surveyed participants, the majority were male (94 %) and aged between 41 and 60 (50 %). Approximately 80 % of the sample were married and had at least one child. Regarding burnout self-report, 50 % reported experiencing burnout episodes more than once a year, 60 % indicated depersonalization when treating their patients yearly, and 57 % acknowledged feeling pressure due to fear of lawsuits more than once annually. Around 10 %

reported experiencing anhedonia daily or for at least two weeks each month. When inquiring about the last month, 10 % reported suffering from depressive mood, hopelessness, or lack of interest. Additionally, nearly 60 % indicated feeling weariness at the end of a workday, while almost 20 % expressed dissatisfaction with their career.

With a confidence level of 95 % and 50 % of orthopaedic specialists experiencing burnout from a 358-sample size, the survey's margin of error was calculated to be 0.0497. This implies that the true proportion of burnout cases in the population is likely to fall within the range of 45 %–55 %.

Self-reported burnout and associated variables

Age ($p = 0.042$), years as a specialist ($p = 0.037$), fear of lawsuits ($p < 0.001$), diet ($p = 0.003$), engagement in recreational activities ($p = 0.004$), depersonalization when treating patients ($p < 0.001$), weariness at the end of a workday ($p < 0.001$), anhedonia ($p < 0.001$), depressive mood ($p < 0.001$), and career dissatisfaction ($p < 0.001$) were the variables in which statistical difference was encountered between subjects with and without self-reported burnout. Further post-hoc analysis conducted for age (adjusted significance for Bonferroni $p < 0.017$) and years as a specialist (adjusted significance for Bonferroni $p < 0.013$) revealed that adults under 40 years versus adults over 60 years ($p = 0.012$) and 5–10 years ($p = 0.003$) versus >30 years as specialist were the significantly different sub-groups among their respective groups.

Significant risk and protective factors for self-reported burnout

The multivariate logistic regression involving the most significant variables (excluding depersonalization when treating patients and career satisfaction) is represented in Table 2. Fear of lawsuits ($p < 0.001$), weariness at the end of a workday ($p = 0.016$), and anhedonia ($p = 0.019$) exhibited stronger direct associations with self-reported burnout. Maintaining a healthy diet demonstrated to be the strongest protective variable ($p < 0.001$), followed by engagement in recreational activities ($p = 0.146$).

Self-reported burnout and country of origin

Table 3 presents a summary of the frequency distribution of self-reported burnout in relation to the country of origin within the studied sample. Only countries that constituted 5 % or more of the total responses were included. Due to the limited number of subjects per country, a statistical evaluation was not feasible.

Discussion

The most important finding of the present study is that over 50 % of the participating Latin American orthopaedic surgeons reported experiencing burnout episodes and depersonalization while treating their patients more than once and at least once a year, respectively. Burnout is known to present when individuals are subjected to prolonged emotional overload, extended working hours, and excessive physical demands, leading to psychological and physiological repercussions [17]. All of these variables are pertinent to the orthopaedic surgery field. The current study's data analysis revealed associated risk and protective factors for self-reported burnout.

Risk factors for self-reported burnout

Fear of lawsuits emerged as the most prominent risk factor for self-reported burnout. This correlation mirrors the experience in North America, where legal actions have been identified as a critical risk variable for burnout among surgeons [1]. Balch et al. underscored that the surge in litigation cases, amplified by media coverage, engenders distress, and apprehension in surgeons' decision-making and actions. This link, in turn, is associated with increasing medical errors and a more pronounced prevalence of burnout [18]. Evidently, the fear of legal repercussions appears well-founded, given that nearly one-third of the participants in the current study reported a history of lawsuits. Notably, orthopaedic surgery ranks among the top five medical specializations with more risk of litigation exposure [19]. In such a context, it becomes imperative for orthopaedic surgeons to carry malpractice insurance, while also bearing in mind that cultivating a strong patient–doctor relationship stands as the most protective measure against legal actions from their patients [20–22].

Weariness at the end of a workday was another crucial factor associated with self-reported burnout. This finding was anticipated, considering that it aligns with one of the three dimensions of the burnout syndrome. Numerous strategies have been proposed to alleviate end-of-day fatigue. For instance, mindfulness techniques, encompassing approaches like emotional freedom techniques, have been explored among healthcare professionals during the COVID-19 pandemic, yielding favourable therapeutic outcomes [23,24].

Anhedonia, characterized by a loss of interest in once–enjoyable activities, emerged as the third most significant factor associated with self-reported burnout. Anhedonia is a cardinal symptom of major depressive disorder. Distinctly, ten percent of the present study's participants reported experiencing anhedonia and a depressive mood for at least two weeks each month, which could potentially indicate a depressive episode [25]. Authors from various studies have consistently reported a direct and independent correlation between depression and burnout [13,26–28]. Discerning between depression and burnout can be intricate due to the overlap in symptoms, such as low mood and fatigue (loss of energy). From a pragmatic perspective, irrespective of precise distinctions, early intervention to address these symptoms is imperative to avert the potential progression of one syndrome into the other. The high prevalence of anhedonia and depressive mood experienced by the present study's professionals is concerning. Undiagnosed or untreated depression can profoundly impede an individual's quality of life. Particularly among physicians, these symptoms have been associated with reduced patient care quality, a higher incidence of unintentional medical errors, and, even more distressingly, elevated suicidal rates [5,11–13].

Orthopaedic surgeons under 40 years old or those with fewer years of experience (<10 years) exhibited a significantly higher propensity to self-reported burnout in comparison to their older and more experienced counterparts. This finding is similar to what was reported in 2001 by Campbell et al. [29], a trend that persists nowadays [30,31]. Younger specialists often contend with high personal and financial aspirations, alongside heightened expectations for achieving a harmonious personal and professional life balance. Negotiating this dual pursuit can prove challenging. Another contributing factor to the elevated burnout rate among younger specialists might be associated with the "fear of missing out" (FOMO) phenomenon, which is particularly prevalent among younger generations [32]. FOMO encompasses the anxiety generated from observing others' experiences via social media, experiences that one is unable to participate in due to existing commitments (such as night shifts, study obligations, rounds, or others). This phenomenon may give rise to stress, emotional fatigue, and persistent questioning of work-related activities, ultimately triggering burnout [32].

While night shifts and extended working hours per day did not exhibit a statistically significant association with self-reported burnout in this study, an upward trend was observed. Multiple investigations have described a connection between burnout and sleep deprivation, although establishing a direct causality remains inconclusive [33,34]. Shanafelt et al. demonstrated a significant association between night shifts and extended work hours with burnout [7,35]. This correlation may be attributed to the increased anxiety and emotional strain experienced during night shifts, in addition to the disruption of the circadian rhythms that can elevate corticosteroid hormone levels [36]. Notably, heavier workloads often impede physicians from engaging in potential protective measures against burnout, such as spending quality time with family and

Table 1
Self-reported burnout among studied variables.

Studied variables		Self-reported burnout		Significance (*p*)	Post-hoc (*p*)
Total cases (n = 358)		No [178 (50 %)]	Yes [180 (50 %)]	–	–
Demographic variables					
Age	Adult under 40 years old [n = 129 (36 %)]	57 (44 %)	72 (56 %)	0.042	0.012 (Under 40 years old vs. Over 60 years old)
	Adult between 41 and 60 years old [n = 180 (50 %)]	89 (49 %)	91 (51 %)		
	Adult over 60 years old [n = 49 (14 %)]	32 (65 %)	17 (35 %)		
Sex	Masculine [n = 336 (94 %)]	167 (50 %)	169 (50 %)	0.978	–
	Feminine [n = 22 (6 %)]	11 (50 %)	11 (50 %)		
Practice location	Rural [n = 4 (1 %)]	2 (50 %)	2 (50 %)	0.761	–
	Capital city [n = 214 (60 %)]	103 (48 %)	111 (52 %)		
	Other city [n = 140 (39 %)]	73 (52 %)	67 (48 %)		
Type of practice	Private insurance institution [n = 150 (42 %)]	77 (51 %)	73 (49 %)		
	Public insurance institution [n = 27 (7 %)]	10 (37 %)	17 (63 %)	0.384	–
	Both: private and public institutions [n = 181 (51 %)]	91 (50 %)	90 (50 %)		
Work-related variables					
Years as specialist	≤5 Years [n = 64 (18 %)]	29 (45 %)	35 (55 %)	0.037	0.003 (6–10 Years vs > 30 Years)
	6–10 Years [n = 74 (21 %)]	28 (38 %)	46 (62 %)		
	11–20 Years [n = 99 (28 %)]	54 (55 %)	45 (45 %)		
	21–30 Years [n = 70 (19 %)]	34 (49 %)	36 (51 %)		
	>30 Years [n = 51 (14 %)]	33 (65 %)	18 (35 %)		
Working hours in a regular workday	≤7 Hours [n = 41 (11 %)]	26 (63 %)	15 (37 %)	0.247	–
	8–9 Hours [n = 131 (37 %)]	61 (47 %)	70 (53 %)		
	10–12 Hours [n = 151 (42 %)]	72 (48 %)	79 (52 %)		
	>12 Hours [n = 35 (10 %)]	19 (54 %)	16 (46 %)		
Night shifts	No [n = 239 (67 %)]	124 (52 %)	115 (48 %)	0.246	–
	Yes [n = 119 (33 %)]	54 (45 %)	65 (55 %)		
Extracurricular activity (Professor–Research)	No [n = 128 (36 %)]	66 (52 %)	62 (48 %)	0.603	–
	Yes [n = 230 (64 %)]	112 (49 %)	118 (51 %)		
Administrative position	No [n = 218 (61 %)]	106 (49 %)	112 (51 %)	0.544	–
	Yes [n = 140 (39 %)]	72 (51 %)	68 (49 %)		
History of lawsuits	No [n = 234 (65 %)]	110 (47 %)	124 (53 %)	0.159	–
	Yes [n = 124 (35 %)]	68 (55 %)	56 (45 %)		
Fear of lawsuits (more than once a year)	No [n = 203 (57 %)]	129 (64 %)	74 (36 %)	<0.001	–
	Yes [n = 155 (43 %)]	49 (32 %)	106 (68 %)		
Social variables					
Marital status	Single [n = 39 (11 %)]	19 (49 %)	20 (51 %)	0.562	–
	Married [n = 288 (80 %)]	144 (50 %)	144 (50 %)		
	Divorced [n = 29 (8 %)]	15 (52 %)	14 (48 %)		
	Widow/widower [(n = 2 (1 %)]	0 (0 %)	2 (100 %)		
Parenthood	No [n = 62 (17 %)]	25 (40 %)	37 (60 %)	0.068	–
	Yes [n = 296 (83 %)]	153 (52 %)	143 (48 %)		
Personal habits					
Alcohol consumption (last 3 months)	No [n = 52 (14 %)]	28 (54 %)	24 (46 %)	0.878	–
	<1 time a month [n = 81 (23 %)]	39 (48 %)	42 (52 %)		
	2-4 times a month [n = 139 (39 %)]	66 (48 %)	73 (52 %)		
	2-3 times a week [n = 63 (18 %)]	34 (54 %)	29 (46 %)		
	>4 times a week [n = 23 (6 %)]	11 (48 %)	12 (52 %)		
Drug consumption (last 3 months)	No [n = 341 (95 %)]	172 (50 %)	169 (450 %)	0.223	–
	Yes [n = 17 (5 %)]	6 (35 %)	11 (65 %)		
Diet	Non-Healthy (n = 57 (22 %)]	17 (30 %)	40 (70 %)	0.003	–
	Healthy [n = 201 (78 %)]	105 (52 %)	96 (48 %)		
Sleep hours during the working week	≤6 h [n = 216 (60 %)]	104 (48 %)	112 (52 %)	0.463	–
	7–8 h [n = 142 (40 %)]	74 (52 %)	68 (48 %)		
Sleep medication	No [n = 44 (12 %)]	16 (36 %)	28 (64 %)	0.076	–
	Yes [n = 314 (88 %)]	162 (52 %)	152 (48 %)		
Recreational activities	No [n = 60 (18 %)]	20 (33 %)	40 (67 %)	0.004	–
	Yes [n = 281 (82 %)]	150 (53 %)	131 (47 %)		
Mood-related variables					
Depersonalization when treating their patients (at least once in a year)	No [n = 143 40 %)]	91 (64 %)	52 (36 %)	<0.001	–
	Yes [n = 215 (60 %)]	87 (40 %)	128 (60 %)		
Weariness at the end of a workday	No [n = 138 (39 %)]	89 (64 %)	49 (36 %)	<0.001	–
	Yes [n = 219 (61 %)]	88 (40 %)	131 (60 %)		

(*continued on next page*)

Table 1 (*continued*)

Studied variables		Self-reported burnout		Significance (*p*)	Post-hoc (*p*)
Anhedonia (more than half of the last month)	No [n = 313 (87 %)]	170 (54 %)	143 (46 %)	<0.001	–
	Yes [n = 45 (13 %)]	8 (18 %)	37 (82 %)		
Depressive mood (more than half of the last month)	No [n = 320 (89 %)]	169 (53 %)	151 (47 %)	<0.001	–
	Yes [n = 38 (11 %)]	9 (24 %)	29 (76 %)		
Career satisfaction	No [n = 76 (22 %)]	24 (32 %)	52 (68 %)	<0.001	–
	Yes [n = 282 (78 %)]	154 (55 %)	128 (45 %)		

In cells percentages correspond to rows' relative frequency.

Table 2
Logistic regression for self-reported burnout and the most representative variables.

Variables	With self-reported burnout [n (%)]	Multivariate analysis	
		Adjusted odds ratio (CI 95 %)	Significance (*p*)
Adult under 40 years old (n = 129)	72 (56 %)	2.02 (0.92–4.40)	0.077
Fear of lawsuits (n = 155)	106 (69 %)	3.64 (2.21–6.01)	<0.001
Healthy diet (n = 201)	96 (48 %)	0.22 (0.11–0.44)	<0.001
Recreational activities (n = 281)	131 (47 %)	0.61 (0.31–1.19)	0.146
Weariness at the end of a workday (n = 219)	131 (60 %)	1.91 (1.13–3.22)	0.016
Anhedonia (n = 45)	37 (82 %)	4.62 (1.29–16.3)	0.019
Depressive mood (n = 38)	29 (76 %)	1.47 (0.42–4.73)	0.571

CI: Confidence interval.

Table 3
Self-reported burnout among different countries.

Country[a]	Responses [n (% from the total sample)]	Self-reported burnout [n (% from each country)]
Argentina	22 (6 %)	4 (18 %)
Peru	21 (6 %)	10 (48 %)
Mexico	20 (6 %)	10 (50 %)
Chile	156 (44 %)	81 (52 %)
Brazil	23 (6 %)	12 (52 %)
Colombia	41 (11 %)	27 (66 %)
Total (n = 358)	283 (79 %)	180 (50 %[b])

[a] Only countries that represented 5 % or more of the total responses were included.
[b] Corresponds to the percentage from the total sample.

friends, pursuing hobbies, engaging in exercise, and taking vacations [7]. Therefore, establishing clear boundaries between work and personal life becomes pivotal. This practice has been recognized as a protective strategy against burnout in the medical profession [37].

Protective factors against self-reported burnout

In relation to the safeguarding elements identified in the current study against self-reported burnout, a healthy diet emerged as the strongest protective factor. Hamidi et al. reviewed the impact of nutrition on physicians' well-being, unveiling that adopting a wholesome diet eases stress and depressive symptoms effectively, thereby conferring advantages to an individual's physical and overall well-being [38]. Although not yielding statistical significance in the logistic regression, engaging in recreational pursuits such as hobbies, exercise, and family activities also exhibited a protective influence. The authors believe physicians who are attentive to their dietary and physical state are likely to maintain positive mental health and exhibit self-care behaviours. Allocating time for self-awareness, mindfulness, and engaging in personally fulfilling activities could potentially prove instrumental in preventing burnout [24,37].

While parenting did not achieve a statistically significant association, it inversely correlated with self-reported burnout. Although this pattern could potentially be linked with age, serving as a confounding variable, it is noteworthy that when stratifying participants by both age and parenthood status, no statistically significant associations were encountered (refer to supplementary information). Various authors suggest that parenthood could contribute to a decreased susceptibility to burnout, as having a family serves as a crucial source of emotional support, alleviating stress arising from work-related pressures [7,9,39].

Shanafelt and Noseworthy reported nine organizational strategies to promote engagement and reduce physicians' burnout [40]. These strategies encompassed acknowledging and assessing the problem, harnessing the power of leadership, developing and implementing targeted interventions, cultivating community at work, using rewards and incentives wisely, aligning values and strengthening culture, promoting flexibility and work-life integration, providing resources to promote resilience and self-care, and facilitating and funding organizational science. According to their institutional experience, the authors demonstrated that deliberate, sustained, and comprehensive efforts by a healthcare organization can significantly reduce the incidence of burnout among physicians.

Sex and self-reported burnout

Being female has been associated as a significant risk factor for emotional stress among surgeons [41,42]. This association might be explained by low gender representation within the speciality, making peer support more challenging for women [43]. However, the present study showed no statistical significance between sex and self-reported burnout, indicating the same distribution between females, males, and the total sample (50 %). Despite the small representation of women in the sample (6 %), which matches other international reports [44,45], this outcome remains consistent with previous findings in Chile, where women, even though they exhibited a higher prevalence of self-reported burnout, did not differ statistically from men [31].

Country of origin and self-reported burnout

Regarding the country of origin, most countries exhibited similar burnout rates, with approximately 50 % of self-reported burnout. However, the limited number of participants per country precluded a comprehensive statistical evaluation. Notably, the study exhibited an overrepresentation of Chilean orthopaedic surgeons. This might be attributed to the fact that the research was conducted by investigators within the same nation, which potentially facilitated the widespread distribution of the survey. Despite the constraint in participant numbers per nation, it is intriguing that Argentina exhibited a lower incidence of burnout, with only 18 % of surgeons reporting experiencing burnout at work. However, other studies assessing burnout among healthcare workers in Argentina have indicated a much higher prevalence, around 84 % [46,47]. Given the success of local studies, such as in Chile, it is recommended that each national orthopaedic society conduct studies using a comparable methodology [31,48]. Gathering precise local data with higher response rates in each country will enhance the accuracy of

assessing burnout rates among orthopaedic surgeons. This will facilitate the development of targeted strategies for prevention and treatment of this growing phenomenon.

Limitations

This study stands out as the first to assess and analyse self-reported burnout among Latin American orthopaedic surgeons, yet it is not exempt from limitations. First, the response rate of 20 % raises the possibility of selection bias. Nevertheless, such bias is inherent in voluntary surveys, which exhibit widely varying response rates (ranging from 6 % to 70 %) depending on elements like survey delivery method, incentive utilization, and questionnaire length and format [49,50].

Second, surveys face the risk of systematic ascertainment bias, especially when investigating a specific outcome. For example, physicians experiencing burnout might have been more inclined to complete the survey compared to those who were not. To address this implicit bias, the authors sent the survey inquiring about life quality aspects among Latin-American orthopaedic surgeons. The burnout-related questions were discreetly embedded among a broader range of questions without highlighting them as the central focus of the survey.

Third, this survey primarily involves self-reported burnout assessments rather than a complete diagnostic questionnaire. Due to practical considerations, the full MBI was not incorporated. Instead, the study adapted three questions, one from each domain, while omitting its optional involvement domain questions [2]. Including the whole MBI questionnaire would have extended response times, potentially resulting in reduced participation rates or incomplete responses. The adapted survey also permitted the exploration of other critical variables influencing burnout reports. Despite the potential for bias, the study's results align with findings from international literature [7,9,33,34,38,39]. It is also crucial to acknowledge the strong association found between self-reported burnout and variables like depersonalization in patient care and career dissatisfaction, both of which are integral components of burnout syndrome [2]. These variables were included in the survey to enhance its validity. As this report opens the discussion on the heightened prevalence of burnout sensations among Latin American orthopaedic surgeons, future investigations could incorporate the complete MBI questionnaire and explore other potential risk factors, such as economic and financial aspects [1].

Lastly, this report solely focused on orthopaedic specialists, which may not necessarily be representative of other medical specialities' reality. Nonetheless, similar international reports have been conducted among surgical specialities [1,7,13].

Analysis and rrecommendations for burnout among orthopaedic surgeons

The high prevalence of self-reported burnout and depersonalization when treating patients among the surveyed Latin American orthopaedic surgeons necessitates concerted action from colleagues, physician societies, universities, and healthcare institutions. It is noteworthy that this study predates the COVID-19 pandemic, and as previously stated, burnout rates have been increasing due to this health crisis [6].

With the aim of promoting both physician's well-being and optimal patient care, the authors recommend several strategies based on the current study's findings and those reported in international literature [7,9,33,34,38–40]. These strategies include integrating a healthy diet, engaging and having protected time for recreational activities, incorporating mindfulness exercises, adopting productivity-enhancing methods such as the Pomodoro Technique (breaking down work into intervals, traditionally 25 min in length, separated by short breaks, proposing to enhance focus, productivity, mood, and efficiency by providing a structured approach to work), setting aside designated mobile-free periods daily, practicing judicious use of social media, while distinguishing between personal, social, and professional aspects, and harnessing the potential of artificial intelligence to enhance productivity. Additionally, it is advisable for orthopaedic surgeons and healthcare institutions to advocate for family support and work-life integration, offer malpractice insurance coverage, facilitate peer support groups while cultivating community at work, provide education and preventive strategies, including resources to promote resilience and self-care for high-risk groups such as younger physicians, and most significantly, acknowledge burnout as a substantial occupational concern. This recognition is crucial in preventing burnout, promptly managing symptoms, and avoiding potential suicide risks.

Conclusion

In conclusion, over 50 % of the Latin American orthopaedic surgeons who participated in the survey reported experiencing burnout episodes more than once a year, along with depersonalization when treating their patients at least once a year. Additionally, nearly 10 % of respondents experienced weekly depressive symptoms. Among the noteworthy risk factors for self-reported burnout were fear of lawsuits, weariness at the end of the workday, and anhedonia. Conversely, maintaining a healthy diet emerged as the most potent protective factor.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

David Figueroa reports a relationship with International Society of Arthroscopy Knee Surgery and Orthopaedic Sports Medicine that includes: board membership. David Figueroa reports a relationship with JISAKOS that includes: board membership.

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Appendix A. Supplementary data

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