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Burnout syndrome, sleep quality and the effect of the practice of physical activities among community pharmacists in Douala, Cameroon: a cross-sectional study

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Abstract

Background Burnout is a human psychological response to work stress, increasingly prevalent among healthcare professionals and associated with multiple contributing factors. The present study aimed to determine burnout prevalence and its associations with physical activity (PAc) and poor sleep quality (PSQ) in community pharmacists.

Method A cross-sectional study was conducted among community pharmacists in Douala, Cameroon. Burnout was assessed using the Maslach Burnout Inventory Human Services Survey (MBI-HSS). PSQ and PAc were assessed using the Pittsburgh Sleep Quality Index and the International Physical Activity Questionnaire (IPAQ short form), respectively. Associations were tested using chi-squared tests and bivariate analysis, with statistical significance set at $P<0.05$.

Results A total of 136 pharmacists (mean age 32±7 years) with female dominance ($n=72\%$, 52.9%) were included. The overall prevalence of burnout was 65.4% ($n=89/136$), with low severity in 82.0% ($n=73/89$), moderate in 7.9% ($n=7/89$) and severe in 10.1% ($n=9/89$). High emotional exhaustion (EE), high depersonalization and low personal accomplishment were found in 20.6% ($n=28$), 14.0% ($n=19$) and 51.5% ($n=70$) of participants, respectively. Burnout was more ($P>0.05$), in males ($n=45$, 50.6%), in pharmacists under 30 years old ($n=41$, 46.1%) and in those who found work exhausting ($n=29$, 32.6%). Likewise, most of the assistants' pharmacists were suffering from burnout ($n=77$, 86.5%), more than half of participants with PSQ (n=,62, 69.7%) and moderate PAc ($n=61$, 68.5%) were affected by burnout. Ppresence of burnout was significantly associated with taking annual holidays (OR: 0.34; 95% CI. 0.13–0.89; $P=0.02$). Pharmacists with other activities were associated with low burnout (OR: 2.29; 95% CI. 1.10–4.77; $P=0.02$). Depending on the dimension, pharmacists with PSQ

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were associated with high or moderate EE (OR: 2.26; 95% CI. 1.10–4.78; $P=0.03$). Furthermore, moderate PAc was associated with higher odds of high/moderate depersonalization compared with low PAc (OR: 5.10; 95% CI. 1.41–18.40; $P=0.01$) No statistically significant association was found between overall burnout and PAc or PSQ.
Conclusion This study revealed a high prevalence of burnout among community pharmacists, predominantly of low severity. PSQ was associated with high or moderate EE. Even moderate PAc was associated with higher odds of depersonalization.

Keywords Burnout · Community pharmacists · Quality of sleep · Physical activity · Douala · Cameroon

Abbreviations

BOS	Burn-out syndrome
EE	Emotional exhaustion
DP	Depersonalization
PA	Personal accomplishment
PSQ	Poor sleep quality
PAc	Physical activities
CPH	Community pharmacists

Background

Across all industries, employees encounter significant physical and mental pressures in their efforts to enhance service quality and productivity [1]. These conditions result in excessive workload and leave workers vulnerable to a state of severe fatigue known as burnout syndrome (BOS) [2]. BOS is an occupational syndrome related to work stress, presenting as emotional exhaustion(EE), increased levels of depersonalization (DP) and reduced sense of personal accomplishment (PA) as reported by [2]. This psychosomatic affection constitutes a serious health concern in the modern working environment. The World Health Organization's International recognized BOS as an "occupational phenomenon" in May 2018 within the 10th revision of International Classification of Diseases (ICD) [2, 3]. Moreover, BOS negatively affect psychological and physical health [4, 5] and suicidal ideation [6].

Numerous studies have highlighted that healthcare professionals are at an increased risk of BOS which has negative outcomes such as reduction in productivity, increased job turnover and reduced psychological and physical well-being, medication errors, reduced quality of care and fatalities [7–9]. Pharmacists play an essential role in the healthcare system, particularly in the safety and effectiveness of the use of medicines, continuity of supply amid regular medicines shortages, and compounding of medicines and medicines information. They are permanently in contact with patients, due to the convenience resulting in a high number of patients and prescription volumes, frequent clinical visits and patient education. This workload and responsibilities, coupled with the pressure associated with patient urgency likely due to the unexpected COVID-19, may impact the physical and psychological well-being and BOS rates of pharmacists [8]. Pharmacists are not spared by this psychosomatic pathology [10, 11]. In developed countries, the risk of BOS in pharmacists is almost comparable to that of medical doctors and nurses [12, 13].

Previous studies have shown that the rate ranges from 51 to 74.9% among pharmacists in the health system [14–16]. The elevated prevalence and persistence of BOS among pharmacy professionals can result in multiple adverse outcomes, including increased healthcare expenditures for patients, higher incidence of medication errors, extend patient recovery periods, and diminished patient satisfaction ratings and overall care quality. Additionally, workplace productivity declines while employee absenteeism rises [12]. Many pharmacists work routine overnight shifts to provide continuous patient care; often relying on caffeine consumption through coffee or tea

to fight fatigue. Consequently, this night-shift work correlates with sleep disturbances that negatively impact both health outcomes social relationships [17, 18]. Beyond workload, and work-related stress, some authors have established a strong causal link between poor sleep quality (PSQ) and BOS [17, 19, 20]. Previous studies established a strong link where poor sleep can precipitate BOS, a state highly prevalent among community pharmacists. Studies involving healthcare workers have demonstrated that poor sleep is a significant risk factor, making individuals substantially more likely to report BOS on workdays compared to those with PSQ [21]. Furthermore, a study on health and burnout among pharmacists during the COVID-19 pandemic revealed that more than half of the pharmacists indicated the pandemic negatively impacted their sleep, with nearly half obtaining less sleep [22].

Also, pharmacists' work involves extended periods of standing and moving around the pharmacy shelves to serve patients, which means they engage in physical activities (PAc) throughout their workday [10, 11]. Substantial evidence demonstrates that PAc serves as a non-pharmacological strategy for preventing BOS and its components [21–23]. Promoting PAc, including occupational activity, is a beneficial strategy for improving well-being, which can indirectly or directly address burnout and poor sleep quality among pharmacists. While direct studies specifically measuring the impact of occupational PAc on sleep in pharmacists are limited, research on healthcare workers generally supports the role of PAc in mitigating burnout [24]. Studies focused on pharmacists' highlight that lower levels of PAc are associated with longer working hours, suggesting that incorporating activity, such as taking walking breaks, could be a vital intervention to combat job strain that leads to burnout [25]. Moreover, general recommendations for pharmacists to mitigate burnout include engaging in healthy lifestyle behaviors like exercise [26] and obtaining appropriate sleep [22].

In the Sub-Saharan region, BOS is a reality among healthcare professionals [10] but there is a dearth of studies among Pharmacists, just one in Nigeria [27]. In low-income settings such as Cameroon where some modern societal conditions related to job environment and international standards are not respected, BOS is prevalent in some healthcare sectors like medical practitioners and paramedical staff [28]. Therefore, this study aimed to determine the prevalence of BOS and to examine its association with PAc and PSQ among community pharmacists in Douala, Cameroon.

Methods

Study area

A cross-sectional study was conducted among community pharmacists (CPH). The study was carried out among community pharmacists (CPH) practising in the Littoral regional capital, Douala (Wouri division), Cameroon, an area covered by both officinal and hospital pharmacies. Community pharmacies were chosen because of the high influx of customers seeking medicines that are sometimes unavailable in hospital pharmacies, and because CPH are regularly solicited for medicines-related advice and patient education.

Study population

The target population consisted of pharmacists (owners and assistants) working in community pharmacies in Douala.

Eligibility criteria

Inclusion criteria: pharmacists working in a community pharmacy in Douala with a professional seniority of at least one year, who agreed to participate. Exclusion criteria: pregnant pharmacists and pharmacists on sick leave/convalescence at the time of data collection.

Ethical considerations

The study was approved by the Institutional Ethics Committee of the University of Douala (reference: CEI-UD/3602/04/2023/T) and was conducted in accordance with the Declaration of Helsinki (revised 2013). All participants provided written informed consent before enrolment and were informed that their data would be analysed anonymously and that personal information would not be disclosed.

Sample size

The minimal sample size was determined using the formula for estimating a single proportion: $n = Z^2 \times P(1-P) / d^2$, where $Z = 1.96$ (95% confidence level), $P = 7.3\%$ (0.073), the burnout prevalence reported among Portuguese pharmacists in the COVID-19 context by Santos et al. [29], and $d = 5\%$ (0.05) the desired precision. Substituting these values ($n = 1.96^2 \times 0.073 \times 0.927 / 0.05^2$) gave a minimal required sample size of 104 pharmacists. A total of 136 pharmacists were enrolled, exceeding this minimum.

Data collection

Data were collected from December 2023 to February 2024. A paper-based questionnaire was administered to CPH by members of the investigation team within the pharmacies during afternoon break hours. The mean time required to complete the questionnaire was 20 min.

Professional and sociodemographic characteristics

Participants responded to the questions concerning their sociodemographic characteristics (gender, age, and marital status) and professional characteristics (employment status, job perception, taking annual holidays, salary satisfaction, conflictual relationship, work seniority).

Burnout

The measurement of BOS was carried out using the Maslach BOS Inventory for Human Services Survey (MBI-HSS) [30]. This psychometric instrument is a reliable, widely used and validated tool for assessing BOS among healthcare personnel. This tool consists of 22 questions measuring three distinct dimensions of BOS; EE with 9 items, DP with 5 items and PA with 8 items. The items are scored on a 7-point Likert scale ranging from 0 (never) to 6 (every day). EE scores > 27 indicate high EE, while a score < 16 means a low level. DP scores > 13 indicate a high level of DP, while < 6 indicates a low level. PA scores > 37 indicate a high level of self-accomplishment, and < 31 indicate a low level. Each subscale was classified as low, moderate, and high. The severity of BOS was low if one dimensions reached (high EE, high DP, or low PA), moderate if two dimensions are reached (high EE+ high DP; high EE + low PA or high DP + low PA) or severe if all three dimensions are reached (high EE + high DP + low PA). The MBI-HSS internal consistency was assessed using Cronbach's alpha coefficient, which was 0.90.

Quality of sleep

The Pittsburgh Sleep Quality Index (PSQI) has been used to assess sleep quality [31]. This questionnaire assesses the quality of sleep of a participant for a month. PSQI consists of 19 items on seven components of sleep quality: sleep onset latency, sleep duration, efficiency, quality, disturbances, medication, and daytime dysfunction. Each component of PSQI is scored between 0 and 3, and the sum of the seven components yield a global score of sleep quality with a total score ranging from 0 to 21 points; a high score (PSQI score > 5) is an indication of poor

quality of sleep. The internal consistency of the PSQI was assessed using Cronbach's alpha coefficient, which was 0.91.

Physical activity

The International Physical Activity Questionnaire (IPAQ) short version was administered to assess the level of physical activity. This tool has good validity and reliability in quantifying physical activity [32] with an internal consistency was assessed using Cronbach's alpha coefficient, which was 0.90. The IPAQ short version evaluates physical activity across three distinct domains (occupational physical activity, travel to and from places and leisure-time physical activity). The initial six items of this questionnaire require participants to report frequency and duration involvement in low-, moderate- and vigorous-intensity physical activity during the preceding seven-days period. For analytical purposes, the metabolic equivalent task (MET) values expressed as (MET) values expressed as weeks/minutes were computed from raw data collected via the six items, according to the guidelines of the IPAQ scoring procedure [33]. Subsequently, participants were stratified into three categories (low, medium and high activity levels) based on their MET scores according to standardized classification criteria of this assessment tool the guidelines of this tool.

Statistical analysis

The data were entered using Microsoft Excel 2016 and analysed with the Statistical Package for Social Sciences (SPSS version 20). The Kolmogorov–Smirnov test was performed to assess the normality of continuous data. Qualitative variables were presented as frequencies and percentages, n (%), and quantitative variables as mean ± standard deviation. The chi-squared test (or Fisher's exact test when expected cell counts were below 5) was used to compare categorical variables between groups. Bivariate analysis was performed to compute crude (unadjusted) odds ratios (OR) with 95% confidence intervals (CI) for the association between overall burnout, its dimensions (high EE, high DP, low PA), and each sociodemographic/professional, sleep-quality and physical-activity variable considered individually. The statistical significance threshold was set at $P < 0.05$.

Results

Sociodemographic and professional characterization of participants

A total of 136 pharmacists working in community pharmacies participated in the study. The mean age was 32 ± 7 years. More than half of the pharmacists were female ($n = 72$, 52.9%) and single ($n = 75$, 55.1%). Salary dissatisfaction was reported by 53.7% ($n = 73$). Most of the participants were assistant pharmacists ($n = 116$, 85.3%), had less than five years of seniority ($n = 99$, 72.8%) and took annual holidays ($n = 103$, 75.7%), Women taking more than men ($n = 61$, 84.7%; $P = 0.02$). Regarding job perception, 38.2% ($n = 52$) found their work exhausting. A conflictual relationship with colleagues was reported by 62.5% ($n = 85$), poor sleep quality (PSQI ≥ 5) by 70.6% ($n = 96$), and a moderate level of physical activity by 66.2% ($n = 90$), as shown in Table 1.

Prevalence and severity of burnout

The overall prevalence of burnout was 65.4% ($n = 89/136$). Among pharmacists with burnout, most had low-severity burnout (82.0%, $n = 73/89$), while 7.9% ($n = 7/89$) had moderate and 10.1% ($n = 9/89$) had severe burnout. By gender, low burnout was reported in 48.6% ($n = 35/72$) of females and 59.4% ($n = 38/64$) of males, moderate burnout in 5.6% ($n = 4/72$) of females and 4.7% ($n = 3/64$) of males, and severe burnout in 8.3% ($n = 6/72$) of females and 4.7% ($n = 3/64$) of males, with no statistically significant difference by gender, as presented in Fig. 1.

Table 1 Sociodemographic and professional characterization of participants

Variable	Modalities	Total *n*(%)	Male *n*(%)	Female *n*(%)	*P*-value
Gender			64(47.1)	72(52.9)	
Age (years)	<30	62(45.6)	29(45.3)	33(45.8)	
	30– 40	63(46.3)	28(43.8)	35 (48.6)	
	>40	11(8.1)	7(10.9)	4(5.6)	0.50
Marital Status	Single	75(55.1)	40(62.5)	35(48.6)	
	Married	56(41.2)	21(32.8)	35(48.6)	
	Divorced	5(3.7)	3(4.7)	2(2.8)	0.17
Employment status	Assistant	116(85.3)	53(82.8)	63(87.5)	
	Owners	20(14.7)	11(17.2)	9(12.5)	0.60
Job seniority (years)	<5	99(72.8)	46(71.9)	53(73.6)	
	>5	37(27.2)	18(28.1)	19(26.4)	0.97
Salary satisfaction	Yes	63(46.3)	26(40.6)	37(51.4)	
	No	73(53.7)	38(59.4)	35(48.6)	0.28
Holidays	Yes	103(75.7)	42(65.6)	61(84.7)	
	No	33(24.3)	22(34.4)	11(15.3)	**0.01***
Job perception	Work exhausting	52(38.2)	23(35.9)	29(40.3)	
	Work constraining	27(19.9)	10(15.6)	17(23.6)	
	Work stressing	20(14.7)	11(17.2)	9(12.5)	0.44
	work complaint	19(14.0)	12(18.8)	7(9.7)	
	Work pleasant	18(13.2)	8(12.5)	10(13.9)	
Conflict with colleagues	Yes	85(62.5)	35(54.7)	50(69.4)	
	No	51(37.5)	29(45.3)	22(30.6)	0.11
PSQI score	<5	40(29.4)	23(35.9)	17(23.6)	
	≥5	96(70.6)	41(64.1)	55(76.4)	0.17
Level of PAc	Low	23(16.9)	9(14.1)	14(19.4)	
	Moderate	90(66.2)	44(68.8)	46(63.9)	0.70
	High	23(16.9)	11(17.2)	12(16.7)	

PSQI Pittsburgh sleep inventory questionnaire, *PAc* Physical activity

*Statistically significant at *p*-value < 0.05

Burnout dimensions

According to the MBI-HSS dimensions, low personal accomplishment was the most frequent finding (51.5%, *n* = 70/136), followed by high EE (20.6%, *n* = 28/136) and high DP (14.0%, *n* = 19/136); moderate levels of EE, DP and PA were found in 36% (*n* = 49/136), 22.8% (*n* = 31/136) and 16.9% (*n* = 23/136) of respondents, respectively. High EE was found in 22.2% (*n* = 16/72) of females and 18.8% (*n* = 12/64) of males. Moderate EE has been reported in 36.1% of females (26/72) and 35.9% of males (23/64). However, high DP in 16.7% (12/72) (*n* = 28/72) of females and 10.9% (7/64) of males. Low PA in 50.0% (*n* = 36/72) of females and 53.1% (*n* = 34/64) of males as illustrated in Fig. 2.

Factors associated with burnout and its dimensions

Despite no statistical difference ($p > 0.05$), BOS was more in males (*n* = 45, 50.6%), in pharmacists under 30 years old (*n* = 41, 46.1%) and in those who found work exhausting (*n* = 29, 32.6%). Likewise, most of the assistants' pharmacists were suffering from BOS (*n* = 77, 86.5%), more than half of participants had conflictual relationships with colleagues (*n* = 56, 62.9%). PSQ (n=,62, 69.7%) and moderate PAc (*n* = 61, 68.5%) were affected by BOS as presented in Table 2. Bivariate analysis showed that Burnout presence was significantly associated with taking annual holidays, which was associated with lower odds of burnout (cOR: 0.34; 95% CI. 0.13–0.89; *P* = 0.02) (Table 2). CPH with other activities associated with low BOS (cOR: 2.29; 95% CI. 1.10–4.77; *P* = 0.02).

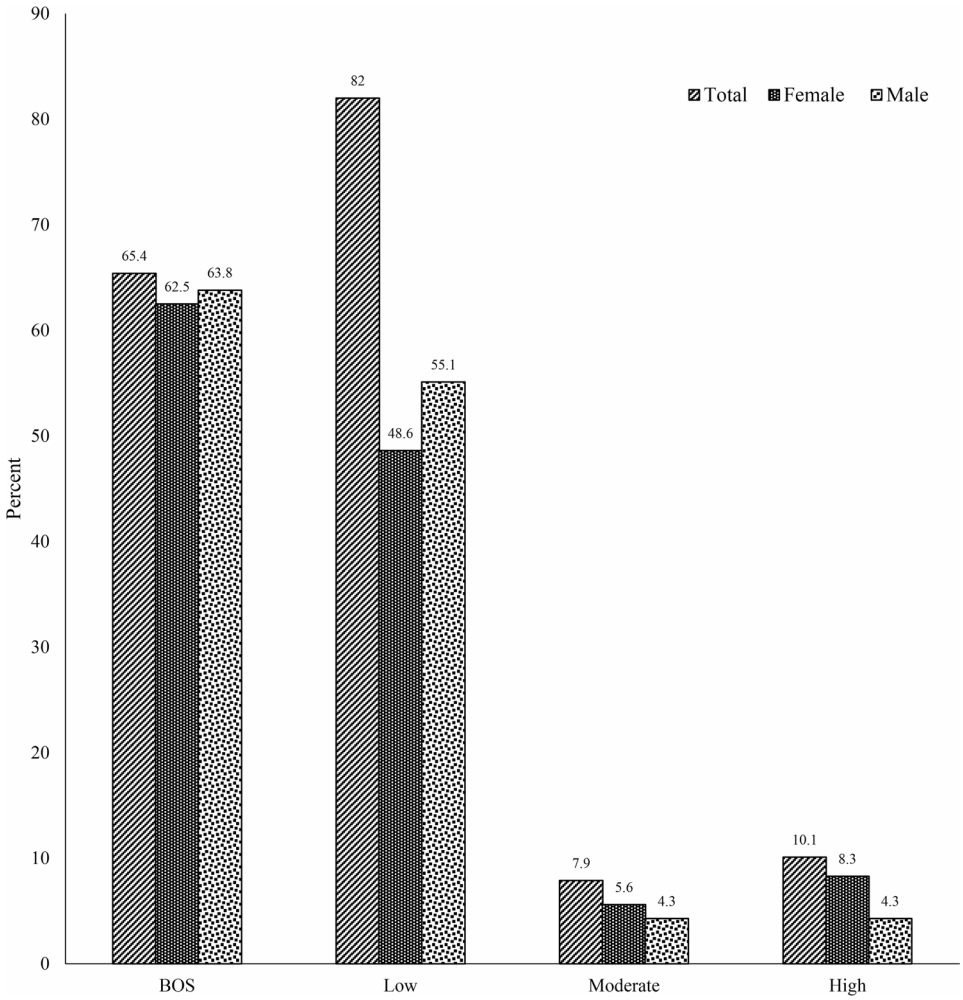

Fig. 1 Prevalence and severity of BOS according to gender. BOS: Burnout syndrome

Depending on the dimension, pharmacists with PSQ were associated with high or moderate EE (cOR: 2.26; 95% CI. 1.10–4.78; $P=0.03$). Furthermore, at the dimension level, moderate PAc was associated with higher odds of high/moderate DP compared with low PAc (cOR: 5.10; 95% CI. 1.41–18.40; $P=0.01$) (Table 3).

Discussion

In this study, we aimed to determine the prevalence of BOS and its association with PAc and PSQ. The results show a high prevalence of burnout among CPH (65.4%). All alarming components of burnout were noticed as high EE, high DP, and low PA in CPH. However, no association between these BOS, PAc and PSQ was found.

The prevalence of BOS among CPH varies according to BOS inventory tools used and health context (pandemic like COVID-19). The prevalence found in this study is in line with studies conducted by pharmacists where BOS ranges from 51-74.9% [15, 16, 34] found before COVID-19. Nevertheless, our prevalence is superior to that noticed by some researchers: In a cross-sectional study conducted in Portugal by Dos Santos et al. [29] among hospitals and CPH using MBI-HSS, low prevalence of BOS (7.3%) was reported during the COVID context. Similarly, Protano et al. [35] in Italy using a Shirom-Melamed Burnout Measure found a low prevalence of 10.5%. The study prevalence was also higher than the prevalence found by Aluh et al. [27] in Nigeria in 2022. In a national study carried out on CPH in France before the COVID-19 pandemic, Balayssac et al. [36]reported an overall prevalence of 56.2%. Elsewhere, other studies noticed a higher prevalence of BOS than ours. In a study

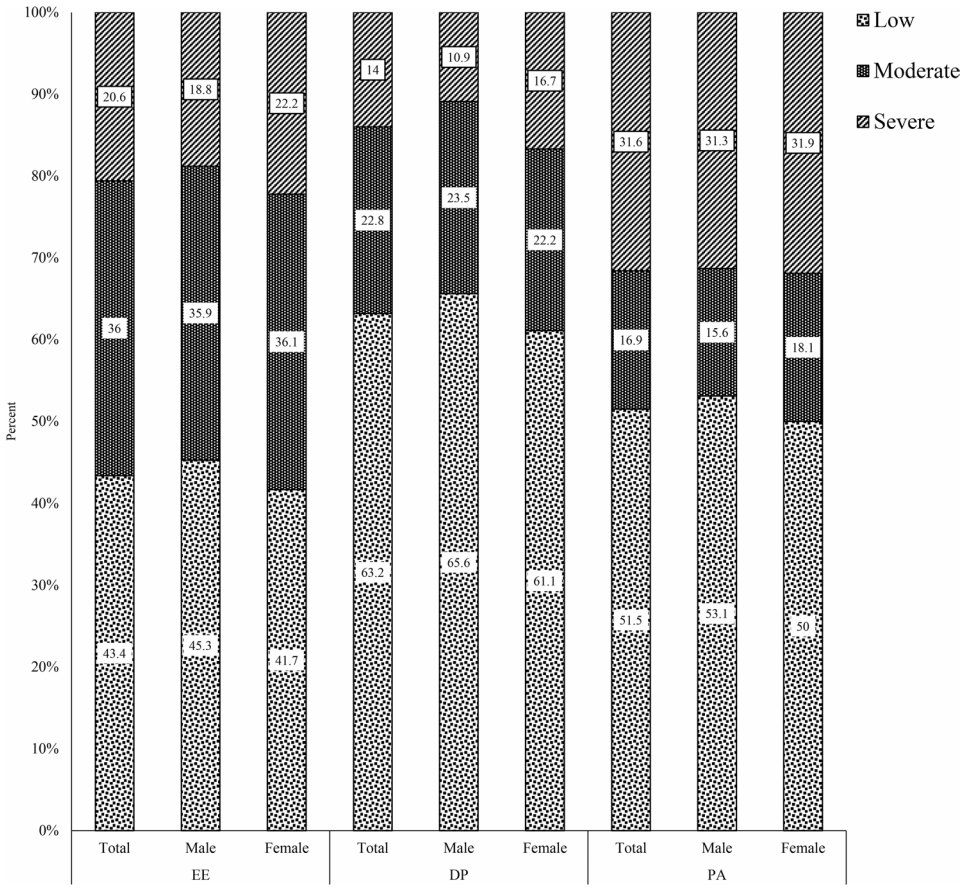

Fig. 2 Dimensions of BOS according to gender. EE: emotional exhaustion; DP: depersonalization; PA: personal accomplishment

in the Ohio State of United States of America on burnout and resilience in community-based pharmacist practitioners [37] found a prevalence of 67.2% which is similar to ours. Also, Youssef et al. [38] in Lebanon reported a work-related burnout prevalence of 76.8% using the Copenhagen Burnout Inventory. In 2022 in Tunisia, Falfel et al. [39] found a prevalence of 76% of BOS in a sample of 258 public and private pharmacists during the COVID-19 pandemic.

According to BOS severity, severe BOS was 10.1%. This result is aligned to that of a French study where severe BOS was 10.5% [36]. However, this prevalence is lower than the 12% reported among European doctors [40] and 28.9% found among Irish and UK urologists [41]. Low BOS was 82%, this prevalence is higher than the 1.2% found among CPH in Turkey [42] and the 28.2% noticed by Balayssac et al. [36]. On the other hand, similar results have been found in South Africa, where pharmacists show low levels of burnout [43]. No significant difference was noticed between males and females concerning burnout levels and dimensions despite higher proportion in females. This result corroborates those of some studies that found no significant difference in BOS between the genders among pharmacists [40, 42]. However, other studies found a higher prevalence of BOS among female pharmacists and considered gender as a strong predictor of BOS [27, 43]. This result would be related to the absence of gender differences in professional and sociodemographic characteristics, showing that the 2 genders undergo the same workload.

Depending on dimensions, low PA (51.5%) and High EE (20.6%) were noticed among the respondents. This result is in line with that of a study who found the prevalence of low PA of 71.3% [42]. Similarly, in a recent study among health system pharmacists in Lebanon [44], low PA and high EE were more prevalent (49.5%; 36.9%). However, in other studies among CPH, high EE was more prevalent [45, 46]. In a systematic review of 15 studies conducted in the United States among pharmacists, high EE was 41%, high DP 20%, and low PA 32% [47]. Low PA is associated with an increased risk of stressful experiences as well [48]. Few of our participants perceived

Table 2 BOS according to professional and sociodemographic characteristics and association with the level of BOS

Parameters	Overall BOS *n*(%)	BOS Moderate/high *n*(%)	cOR	95% CI		*P*-value
				Lower	Upper	
Gender						
Female (ref)	45(50.6)	9(52.9)	1			
Male	44(49.4)	8(47.1)	1.32	0.65	2.69	0.44
Age						
<30 (ref)	41(46.1)	12(70.6)	1			
30–40	40(44.9)	3(17.6)	0.89	0.43	1.86	0.75
>40	8(9)	2(11.8)	1.37	0.33	5.69	0.66
Marital status						
Single (ref)	49(55.1)	14(82.4)	1			
Married	36(40.4)	3(17.6)	0.96	0.46	1.97	0.90
Divorced	4(4.5)	0(0.0)	2.12	0.23	19.98	0.51
Employment status						
Assistant (ref)	77(86.5)	13(76.5)	1			
Owner	12(13.5)	4(23.5)	0.76	0.29	2.01	0.58
Job seniority						
<5 (ref)	66(74.2)	14(82.4)	1			
>5	23(25.8)	3(17.6)	0.82	0.37	1.80	0.62
Salary satisfaction						
No (ref)	36(40.4)	7(41.2)	1			
Yes	53(59.6)	10(58.8)	0.50	0.25	1.03	0.06
Holidays						
No (ref)	62(69.7)	4(23.5)	1			
Yes	27(30.3)	13(76.5)	0.34	0.13	0.89	0.02*
Job perception						
Work complaint (ref)	13(14.6)	3(17.6)	1			
Work exhausting	29(32.6)	3(17.7)	0.58	0.19	1.77	0.34
Work constraining	21(23.6)	4(23.5)	1.61	0.43	6.09	0.47
Work stressing	11(12.4)	1(5.9)	0.56	0.15	2.09	0.39
Work pleasant	15(16.9)	6(35.3)	2.31	0.48	11.12	0.29
Conflict with colleagues						
No (ref)	56(62.9)	11(64.7)	1			
Yes	33(37.1)	6(35.3)	1.05	0.51	2.18	0.88
PSQI score						
<5 (ref)	27(30.3)	8(47.1)	1			
≥5	62(69.7)	9(52.9)	0.88	0.40	1.92	0.74
Level of PAc						
Low (ref)	12(13.5)	2(11.8)	1			
Moderate	61(68.5)	13(76.4)	1.93	0.76	4.89	0.16
High	16(18)	2(11.8)	2.10	0.63	7.01	0.23

cOR crude odd ratio, *CI* confidence interval, *PSQI* Pittsburgh sleep inventory questionnaire, *PAc* physical activity

*Statistically significant at p-value < 0.05

their work pleasant (13.2%) thus highlighting an important workload. According to Demerouti et al. [1] BOS arise when there is a mismatch between job demand and individual resources that lead to EE as the first BOS dimension followed by other [49]. Likewise, high EE and low PA among CPH will result in a higher burden of administration and documentation related to modern pharmacists, which also enhances BOS among other health professionals [13, 50]. On the other hand, the suggested presence of a buffering effect on overall BOS will result in more autonomy in health care professionals, by an increase in direct patient care interactions, and involvement with the health care team may account for the lower DP scores of today's pharmacists, as found in our result [51–53]. It's therefore urgent to reduce DP prevalence for better pharmaceutical care; because in a recent study, it

Table 3 Associated factors of BOS and its dimensions

		Overall BOS		Low BOS		EE (moderate or high)		DP (moderate or high)		PA (moderate and low)	
Variables	**Modalities**	cOR (95%CI)	***P*-value**	cOR (95%CI)	*P*-value	cOR (95%CI)	*P*-value	cOR (95%CI)	*P*-value	cOR (95%CI)	*P*-value
Gender	Female(ref)	1		1		1		1		1	
	Male	1.32 (0.62–2.69)	0.44	1.54(0.78–3.05)	0.20	0.82 (0.44–1.70)	0.66	0.82 (0.30–1.65)	0.58	0.88(0.45–1.73)	0.71
Age (years)	<30(ref)	1				1		1		1	
	30– 40	0.86 (0.43–1.86)	0.71	1.51 (0.74–3.07)	0.24	1.33 (0.66–2.71)	0.41	0.91 (0.43–1.88)	0.80	1.25(0.62–2.53)	0.52
	>40	1.37 (0.33–5.69)	0.92	1.28 (0.35–4.63)	0.70	1.06 (0.29–3.82)	0.93	1.41 (0.39–5.15)	0.60	1.46(0.40–5.28)	0.56
Marital Status	Single(ref)	1		1		1		1		1	
	Married	0.96 (0.46–1.97)	0.90	1.15 (0.57–2.29)	0.70	0.98 (0.40–2.35)	0.94	0.93 (0.45–1.91)	0 0.90	0.62(0.19–3.85.)	0.60
	Divorced	2.12 (0.23–19.98)	0.56	1.38 (0.21–8.76)	0.72	0.45 (0.06–3.64)	0.45	1.11 (0.17–7.11)	0.84	0.74(0.37–1.45)	0.41
Employment status	Assistant(ref)	1		1		1		1		1	
	Owners	0.76 (0.29–2.01)	0.94	0.45(0.17–1.19)	0.11	0.12 (0.01–1.82)	0.12	0.70 (0.25–1.95)	0.48	1.36(0.52–3.51)	0.53
Job seniority (years)	<5(ref)	1		1		1		1		1	
	>5	0.82 (0.37–1.80)	0.92	0.86(0.41–1.85)	0.71	1.06 (0.33–3.39)	0.87	0.91 (0.41–1.99)	0.80	1.35(0.63–2.89)	0.43
Salary satisfaction	Yes(ref)	1		1		1		1		1	
	No	0.50 (0.25–1.03)	0.07	0.56 (0.28–1.11)	0.09	0.72 (0.37–1.43)	0.35	1.11 (0.56–2.23)	0.76	1.38(0.63–3.82)	0.42
Holidays	No(ref)	1		1		1		1		1	
	Yes	0.34(0.13–0.89)	**0.02***	0.58 (0.26–1.30	0.19	0.47 (0.21–1.10)	0.08	0.85 (0.45–2.31)	0.95	0.62(0.25–1.52)	0.29
Others activities	No(ref)	1		1		1		1		1	
	Yes	1.70 (0.79–3.65)	0.17	2.29 (1.10–4.76)	**0.02***	1.45 (0.71–2.98)	0.30	0.95 (0.46–1.97)	0.89	1.63(0.74–3.58)	0.22
Level of PAc	Low(ref)	1		1		1		1		1	
	Moderate	1.93 (0.76–4.89)	0.17	1.00 (0.31–3.18)	0.99	1.12 (0.31–3.18)	0.96	5.10 (1.41–18.40)	**0.01***	0.56(0.22–1.43)	0.22
	High	2.10 (0.63–7.01)	0.17	1.31 (0.52–3.29)	0.56	1.31 (0.52–3.29)	0.56	3.56 (0.80–15.7)	0.09	0.49(0.15–1.60)	0.24
PSQI score	<5(ref)	1		1		1		1		1	
	≥5	0.88 (0.40–1.92)	0.74	0.70 (0.33–1.47)	0.34	2.26 (1.10–4.78)	**0.03***	1.53 (0.69–3.37)	0.29	1.41(0.67–2.98)	0.36

PSQI Pittsburgh sleep inventory questionnaire, *BOS* burnout syndrome, *cOR* Crude odd ratio, *CI* confidence interval, *EE* emotional exhaustion, *DP* depersonalization, *PA* personal accomplishment ratio, *CI* confidence interval, *PAc* Physical activity

*Statistically significant at *p*-value < 0.05

has been established that high EE and DP are powerful indicators of a decrease in the quality of pharmaceutical care with a special emphasis on communication with patients. These variations in burnout levels and prevalence could stem from the differences in the basic professionals and sociodemographic determinants of BOS in each country and health context (COVID-19).

In our study, 70.6% of CPH had poor sleep quality, in which more than half (69.7%) had BOS without statistical significant difference. This result is in accordance with that of Bika et al. [54] in Cameroon among healthcare professionals who found 62.1% of participants had BOS and PSQ. In a longitudinal study, Sonnenschein et al. [55] revealed that BOS patients with PSQ showed higher levels of EE within a 6 months follow-up. A meta-analysis article by Membrive-Jiménez et al. [56] showed a relationship between BOS and PSQ in nurses. Therefore, a chronic exposure to work stress causing BOS is related to substantial poor sleep [57]. The physiologic mechanism underlying BOS associated to PSQ is related to stress that exert an impact on the hypothalamic-pituitary-adrenocortical axis. When a human is stressed, the hypothalamus is activated, corticotropin-releasing hormone and vasopressin are released and stimulate the pituitary to release adrenocorticotropic hormone. Adrenocorticotropic hormone stimulates adrenal cortex to release hormones including the glucocorticoid and cortisol [58].

We found higher odds of high/moderate depersonalization among pharmacists with a moderate level of physical activity compared with those with a low level. This finding does not support the widespread assumption that PAc is a powerful means of preventing BOS. It corroborates that of Asif Ali et al. [59], who did not find a beneficial association between PAc and burnout among university professors in Pakistan. Our results also corroborate those of previous studies conducted in Cameroon, such as Mandengue et al. [60] among medical doctors, who did not find a protective association between PAc and BOS. In a study on the association between PAc and burnout across four occupational sectors, including healthcare professionals (medical doctors, specialist medical doctors and paramedical staff), no protective association was observed by Mekoulou et al. [28]. A cross-sectional study among healthcare professionals in the COVID-19 context in Cameroon by Bika et al. [54] did not find a protective association between PAc and BOS, but rather found higher odds of BOS among participants with a moderate level of PAc.

Our result contrasts with other studies that reported a protective association between PAc and BOS [24]. Evidence for a protective association between PAc or exercise therapy and BOS remains inconsistent [61]. Age and job experience may modulate this association [59]. In our sample, the mean age was 32 ± 7 years, and burnout was more prevalent among pharmacists under 30 years old and those with less than five years of seniority (Table 2), although these differences were not statistically significant. It is also important to note that the IPAQ, as used in this study, captures total physical activity across occupational, transport and leisure-time domains rather than recreational exercise specifically; the absence of a statistically significant association between overall PAc level and burnout in our sample may partly reflect this inability to distinguish domain-specific activity, since occupational activity (which pharmacists accumulate through prolonged standing and moving around the pharmacy to serve patients [11 [12], , may not have the same relationship with burnout as leisure-time exercise. A follow-up study by Vries & Bakker [62] demonstrated that off-job PAc, including recreational and domestic activities specifically, was negatively associated with BOS symptoms, which is consistent with this interpretation.

Limitations

This study has several limitations. First, the cross-sectional design does not allow causality or temporal relationships between burnout, physical activity and sleep quality to be established; a longitudinal design would be needed to examine these relationships over time. Second, only crude (unadjusted) associations are reported: sociodemographic and professional factors such as age, sex, seniority and working conditions may confound the observed associations, but the limited number of moderate/high-severity burnout cases in this sample did not allow a statistically robust multivariable model to be fitted; the reported findings should therefore be interpreted as unadjusted associations. Third, several estimates, particularly in Table 3, had wide confidence intervals reflecting small numbers of observations in some categories, so the corresponding associations should be interpreted

with caution and non-significant findings should not be read as evidence of a true absence of association. Fourth, the relatively small sample size may limit the generalizability of the findings. Fifth, all study tools were self-reported, which may introduce subjective/social-desirability bias. Finally, the IPAQ used to assess PAc captures total physical activity across occupational, transport and leisure domains and does not allow occupational activity to be distinguished from recreational exercise; because physical activity is intrinsic to the pharmacy profession (prolonged standing and movement to serve patients), this may have attenuated the association between overall PAc level and burnout observed in this study.

Conclusion

The present study revealed a high prevalence of burnout among CPH, predominantly of low severity. No statistically significant association was found between overall burnout and either physical activity level or sleep quality in this sample. However, moderate physical activity was associated with higher odds of high/moderate depersonalization. These findings, based on crude associations in a moderate-sized cross-sectional sample, should be confirmed by larger, adjusted and, ideally, longitudinal studies before informing preventive interventions to reduce burnout among CPH and preserve the well-being of this important healthcare sector and the quality of patient care.

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Data availability The datasets analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate The study was approved by the Institutional Ethics Committee of the University of Douala under the reference number: CEI-UD/3602/04/2023/T and was conducted in conformity with the recommendations of the declaration of Helsinki revised in 2013. Participants provided an informed consent before participating.

Competing interests The authors declare no competing interests.

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