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JOB BURNOUT AMONG POLISH DENTISTS: THE ROLE OF SENSORY PROCESSING SENSITIVITY AND EMOTIONAL INTELLIGENCE

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Highlights
- Sensory processing sensitivity increases job burnout in the group of dentists.
- Emotional intelligence may have a protective effect on burnout in dentists.
- Preventing job burnout is important for the quality of health care.

Abstract
Objectives: Job strain in dentistry makes the profession highly susceptible to occupational burnout. People with high sensory processing sensitivity (SPS) perceive workplace as more stressful and more demanding. Emotional intelligence (EI) is both a trait and an ability, which helps individuals adapt to the environment and reduces burnout. This study examines the relationship between SPS and burnout among Polish dentists and whether EI may be a protective factor against burnout in a group of highly sensitive dentists. **Material and Methods:** Polish dentists (N = 201) answered a questionnaire, the short Polish version of the *Highly Sensitive Person Scale* (HSPS-10), the *Trait Emotional Intelligence Questionnaire – Short Form* (TEIQue-SF), the *Oldenburg Burnout Inventory* (OLBI), and the demographic data questionnaire. **Results:** Moderated hierarchical regression analyses showed that SPS can predict burnout factors exhaustion ($p < 0.001$) and disengagement ($p = 0.012$). Higher trait SPS was associated with higher burnout factors. Emotional intelligence can predict burnout factors exhaustion ($p < 0.001$) and disengagement ($p < 0.001$). Higher trait EI was associated with lower burnout factors. Also it turned out that EI moderates the relationship between SPS and burnout factor exhaustion ($p = 0.015$). The findings illustrated reverse buffering effect. UNIANOVA analyses showed that EI may have a protective effect on burnout, although this effect decreases for exhaustion and disappears for disengagement in the group of highly sensitive dentists. **Conclusions:** Sensory processing sensitivity can help to identify dentists who are at risk to develop burnout. Training to increase EI levels can be implemented to reduce the risk of burnout among dentists, although it appears to be insufficient among those at higher risk, i.e., the highly sensitive dentists. This shows the importance of searching for other possible factors that could protect highly sensitive dentists from burnout. Int J Occup Med Environ Health. 2024;37(5) :524–34

Key words:
emotional intelligence, prevention, occupational stress, dentistry, occupational burnout, sensory processing sensitivity

INTRODUCTION

Dentistry is considered one of the most stressful professions [1,2]. During their studies, medical students generally experience more stress than those studying other fields [3], and dental students show more symptoms of depression, anxiety and poorer well-being compared to medical and veterinary students [4]. Importantly, mental health improves as the course of studies progresses for medical and veterinary students, but this improvement is not observed in dental students [4].

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Johns and Jepsen [5] identified as many as 349 stressors in the dental profession. These can be divided into physical and mental factors. The physical factors includes: long working hours [2,6], forced non-ergonomic body posture [1,7], often leading to wrist, arm and shoulder pain [2] and many sources of noise in the dental office [8].

However, psychological factors are the most important sources of stress for dentists. Time pressure [2], fear of getting infected by a sick patient [8], relationships with staff and coworkers [5] are just some of the stressors that dentists report. The psychological factor that generates the greatest tension among dentists is relationships with patients [9]. Aggressive, demanding, anxious, critical, uncooperative and ungrateful patients are the biggest sources of stress [2,5,10]. Situations when a patient waits longer for an appointment are also stressful and so is being perceived by patients as a source of pain and the social belief that dentists are wealthy [5]. Constantly working under stress makes dentistry a profession particularly susceptible to job burnout.

Job burnout is a psychological response to chronic emotional and interpersonal stressors at work [11]. The symptoms of burnout include: emotional exhaustion, when individual feels depleted of emotional resources; depersonalization, i.e., detachment from the job and not caring anymore; and reduced personal accomplishment which consists in feelings of incompetence and lack of achievement [11]. Until the 1990s, burnout was thought to be a syndrome that affected only the so-called helping professions, which involve constant contact with people [12]. Dentistry is such a profession and has been of interest to researchers worldwide for years. According to data from various countries, 10–85% of dentists suffer from job burnout [1,2,13-15]. The results of recent research on professional burnout among Poles show very high levels of burnout among dentists, higher than, for example, general practitioners or police officers [16].

New directions of research on job burnout have shown that this syndrome affects not only support workers and those performing emotional labor, but it can affect other professions too. According to the job demands-resources (JD-R) model [17], a particularly high risk of job burnout occurs in employees who experience high demands at work and at the same time have low resources to meet these requirements [17]. By resources the authors mean organizational factors but also personal ones, e.g., self-efficacy or resilience [17].

The new approach to burnout focuses on 2 aspects: exhaustion (not only emotional, but also physical) and depersonalization (also called cynicism or disengagement) [11]. A particularly important indicator of burnout is exhaustion, the level of which will be determined by organizational factors but also by the employee's perception of his or her work environment [18]. Research among dentists has shown that those who perceive work demands as high experience greater exhaustion [19]. What causes differences in the perception of job requirements? The roots of it may be in the personal resources of the individual.

Many researchers have tried to look for psychological factors which correlate with occupational burnout. One of them is sensory processing sensitivity (SPS). Research shows a positive correlation between occupational burnout and SPS [20–22], also among dentists [23]. Sensory processing sensitivity is a temperament trait characterized by sensitivity to external and internal stimuli [24]. People with high SPS scores have a more reactive nervous system [25]. They are characterized by a high awareness of subtle changes in the environment and a low threshold of arousal by external, emotional and social stimuli [26]. High sensitivity to environmental stimulation makes these individuals susceptible to being shaped by the environment from an early age [27]. They are characterized by a greater response to both negative and positive stimuli [27]. They are more risk-averse and usually take more time to process their action, especially in novel situations, but with repeated exposure to similar stimuli they learn and evolve their responses [27]. The SPS concept has been popularized by Aron et al. [28], and individuals achieving high scores on the SPS scale are called highly sensitive persons (HSP). It is estimated that

20% of people are HSPs [25], and that this trait is genetically determined [27].

Research shows that highly sensitive persons perceive workplace as more stressful and more demanding, comparing to people with a low level of sensory sensitivity [29]. Vander Elst et al. showed a significant interaction of high sensitivity with the relationship between high job demands and emotional exhaustion – high sensitivity intensifies this correlation [29]. Meyerson et al. [23] investigated the relationship between SPS and job burnout among Israeli dentists and came to the conclusion that a high score on the SPS scale could be one of the predictors of job burnout among dentists. However, there is still no research on the factors that may protect highly sensitive dentists from job burnout. This is an important topic since job burnout is associated with poorer well-being, depression and anxiety [11]. It reduces job performance and job satisfaction [11], which leads to poorer quality of treatment. Is there any skill that highly sensitive dentists can develop to reduce the risk of burnout?

The literature provides some evidence of negative correlations between job burnout and emotional intelligence (EI) [30–33]. Emotional intelligence is both a trait and an ability, which characterizes individuals with high level of empathy, assertiveness and adaptability [34]. Emotional intelligence includes appraisal, expression and regulation of one's own and others' emotions, and the use of these emotions to adapt to the environment [35]. It has been shown that people with high EI cope with stress in adaptive ways, use problem-focused coping and positive emotional-focused coping style [36,37]. The relationship between EI and stress-coping strategies was also studied among dental students, showing that dental students with high EI cope better with stressful situations and those with low EI are prone to health-damaging behaviors [38]. However, studies on EI have not yet been conducted among working dentists. Szczygieł and Mikołajczak [31] examined positive and negative emotionality and their relationship with burnout among Polish nurses. They showed that negative emotionality correlates positively with burnout, but this relationship is moderated by emotional intelligence. Emotional intelligence has been shown to be a protective factor against burnout for nurses with negative emotionality, and it may also prove to have positive impact for highly sensitive dentists.

The study aimed to examine the association between SPS and occupational burnout among Polish dentists. The authors also wanted to determine if EI would moderate the relationship between SPS and burnout among dentists, similarly to how it moderates the relationship between negative emotionality and burnout. The authors proposed the following hypotheses:

- H1: Dentists who are highly sensitive are more likely to experience burnout compared to dentists who do not exhibit this trait.
- H2: Dentists with high EI are less likely to experience burnout compared to dentists with low emotional intelligence.
- H3: Emotional intelligence moderates the relationship between SPS and burnout in such a way that this relationship is weaker among those with higher EI than among those with lower EI.

MATERIAL AND METHODS

Participants

The data were collected in July–October 2023. Invitation to participate in the study was published via posts in 3 professional Facebook groups for dentists and using snowball sampling. The invitation contained a link to the research questionnaire, which included an informed consent form. Participants submitted their responses anonymously. The study received approval by the Ethical Review Board at SWPS University of Social Science and Humanities, Poland, Faculty of Psychology in Sopot (WKE/S2023/09/07/130) and followed the ethical guidelines outlined in the Declaration of Helsinki.

Of the 334 dentists who clicked on the invitation link, 215 completed and submitted the questionnaires (60% response rate). Respondents who did not pass the attention check question ("In this question choose answer 2") were deleted. The final sample contained 201 respondents.

Measures

The online survey included the following scales:

- The short Polish version of the *Highly Sensitive Person Scale* (HSPS-10) by Baryła-Matejczuk, Poleszak and Porzak [39] was used to measure SPS. The HSPS-10 includes 10 items scored from 1 (not at all) to 7 (definitely yes). The instrument contains 3 subscales of SPS: ease of excitation (EoE), low sensory threshold (LST), aesthetic sensitivity (AES). The Cronbach's α coefficients in the current study sample were 0.75 for the overall SPS scale and 0.81, 0.86, 0.66 respectively for the EoE, LST and AOE subscales.
- The *Trait Emotional Intelligence Questionnaire – Short Form* (TEIQue-SF), Polish version by Szczygieł, Jasielska and Wytykowska [40] was used to measure emotional intelligence. The TEIQue-SF includes 30 items scored from 1 (completely disagree) to 7 (completely agree). The Cronbach's α coefficient in the current study sample was 0.89.
- The *Oldenburg Burnout Inventory* (OLBI) Polish version by Baka and Basińska [41], was used to measure burnout. The OLBI includes 16 items scored from 1 (definitely agree) to 4 (definitely disagree). The instrument divides burnout into 2 subscales: exhaustion and disengagement. The Cronbach's α coefficients in the current study sample were 0.89 for the general OLBI scale and 0.86 and 0.75 respectively for the exhaustion and disengagement subscales.

Demographic data and professional profile questionnaire collected information on gender, age, place of residency, workload, specialization, professional experience, working in the private or public sector, and type of employment.

Statistical analysis

Descriptive statistics (frequencies, means [M] and standard deviations [SD]) were calculated for the relevant variables. Pearson's r correlations were used to analyze bivariate associations. Univariate analyses were performed to measure the underlying relationships between the independent variables (gender, age, workload, specialization, years of experience, SPS and its subscales scores, EI score) and the dependent variables (OLBI score and subscales). Independent variables that showed significant correlation coefficients were subsequently entered into 2 linear regression analyses, with the 2 OLBI factors as dependent variables. To investigate the moderating effect of EI on the relationship between sensitivity and burnout, an UNIANOVA analysis was conducted. The data were coded and analyzed using IBM SPSS Statistics for Windows v. 29.0 (released 2022; IBM Corp., Armonk, NY, USA). The Daniel S Soper Interaction software version 1.7.2211 was used to depict the moderating effects.

RESULTS

Demographics, professional training and workload

In the sample of 201 dentists, 37 (18%) were male and 164 (82%) were female. This approximately represents the gender distribution in the dental profession in Poland (76% of whom are women) [42]. The participants were, on average, 33.88 years old (SD = 7.85), and ranged 25–59 years old. Details about demographics and professional data are shown in Table 1.

Univariate analyses

The SPS score was positively correlated with burnout ($r = 0.44$, $p < 0.001$) and its factors: exhaustion ($r = 0.45$, $p < 0.001$) and disengagement ($r = 0.35$, $p < 0.001$). There was a negative correlation between SPS and EI ($r = –0.42$, $p < 0.001$). Emotional intelligence was correlated negatively with burnout ($r = –0.65$, $p < 0.001$) and its factors. Means, SDs, internal consistency coefficients (Cronbach's α) and intercorrelations of all the variables are shown in Table 2.

Moderating role of EI

To evaluate the role of SPS and EI in explaining job burnout, a moderated hierarchical regression analysis was performed. In the first step, the variables gender and age were entered as independent variables and burnout symptoms (exhaustion, disengagement) were an outcome variable. In the second step traits SPS and EI were entered as independent variables to examine the main effects of SPS and EI on burnout. In the third step an interaction term was introduced to investigate the moderating role of EI on the relationship between the SPS and burnout factors. The results of the regression analysis are shown in Table 3.

In the first step gender and age were not significant predictors of exhaustion and disengagement.

In the second step SPS and EI separately emerged as significant predictors of exhaustion and disengagement, which supports H1 and H2. The relationships between the SPS predictor and both exhaustion ($\beta = 0.20$, $p < 0.001$) and disengagement ($\beta = 0.17$, $p = 0.012$) are weak and positive. The relationship between the EI predictor and exhaustion is strong and negative ($\beta = -0.60$, $p < 0.001$). The relationship between the EI predictor and disengagement is moderately strong and negative ($\beta = -0.45$, $p < 0.001$).

In the last step an interaction effect of SPS and EI emerged as significant. The relationship between the interaction SPS × EI and exhaustion is very strong and positive ($\beta = 0.73$, $p = 0.015$). The relationship between the interaction SPS × EI and disengagement reached marginal significance ($p = 0.066$). This relationship is strong and positive ($\beta = 0.66$). The full model explains 50% of the variance in exhaustion and 29% in disengagement. This analysis shows that EI is a significant moderator that could influence the relationship between selected aspects of SPS and burnout symptoms, which supports H3. The results are presented in Figure 1.

To investigate deeper the moderating effect of EI on the relationship between SPS and burnout, an ANOVA analysis was conducted. The sample was divided into 3 subgroups by the 30th and 70th percentile of SPS. The one-way ANOVA results showed significant differences in the burnout exhaustion factor between each group of sensitivity (low, medium, high). There was a significant difference in disengagement between respondents with high sensitivity and other groups. There was no significant difference in disengagement between low and medium sensitivity groups.

Table 1. Demographics, professional status and workload of the study population of Polish dentists, the online survey, Poland, 2023

Variable	Participants (N = 201)	
	n	%
Workload		
<20 h/week	13	6.5
20–40 h/week	144	71.6
>40 h/week	44	21.9
Place of residency		
country	12	6.0
city		
<50 000 inhabitants	23	11.4
50 000–150 000 inhabitants	24	11.9
150 000–500 000 inhabitants	51	25.4
>500 000 inhabitants	91	45.3
Professional experience		
<5 years	75	37.3
5–10 years	66	32.8
10–20 years	39	19.4
>20 years	21	10.4
Specialization		
intern	11	5.5
resident	19	9.5
specialist	24	11.9
general dentist	147	73.1
Work sector		
private	136	67.7
public	3	1.5
both	62	30.8

Table 2. Means, standard deviations, internal consistency reliability (Cronbach's α) and intercorrelations among all study variables in the study on the population of Polish dentists (N = 201), online survey, Poland, 2023

Variable	Correlation							M	SD	Cronbach's α
	1	2	3	4	5	6	7			
1. Exhaustion								2.79	0.64	0.86
2. Disengagement	0.73***							2.52	0.57	0.75
3. Sensory processing sensitivity	0.45***	0.35***						4.97	0.92	0.75
4. Ease of excitation	0.52***	0.35***	0.87***					4.80	1.34	0.81
5. Low sensory threshold	0.32***	0.24***	0.63***	0.40***				5.13	1.56	0.86
6. Aesthetic sensitivity	–0.08	0.05	0.40***	0.03	0.02			5.14	1.14	0.66
7. Emotional intelligence	–0.68***	–0.52***	–0.42***	–0.52***	–0.32***	0.17*		4.43	0.79	0.89
8. Age	–0.08	0.04	–0.09	–0.15*	–0.02	0.06	0.04	33.88	7.85	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 3. Results of moderated hierarchical regression analyses of sensory processing sensitivity (SPS) and emotional intelligence (EI) on exhaustion and disengagement in the study on the population of Polish dentists (N = 201), online survey, Poland, 2023

Variable	Step 1	Step 2	Step 3
Exhaustion			
gender	–0.02	–0.02	–0.02
age	–0.08	–0.04	–0.04
SPS		0.20***	–0.50
EI		–0.60***	–1.26***
SPS × EI			0.73*
R^2 (adjusted)	–0.003	0.49***	0.50*
ΔR^2	0.007	0.49	0.02
Disengagement			
gender	0.02	0.02	0.01
age	0.04	0.07	0.07
SPS		0.17*	–0.45
EI		–0.45***	–1.04**
SPS × EI			0.66
R^2 (adjusted)	–0.009	0.28***	0.29
ΔR^2	0.001	0.30	0.01

Step 1 – gender and age as independent variables; step 2 – SPS and EI as independent variables; step 3 – interaction SPS and EI.
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

The UNIANOVA analysis examining the interaction effect of SPS and EI on the exhaustion burnout factor showed significant main effects of SPS ($F(2, 192) = 9.20$, $p < 0.001$, $\eta^2 = 0.09$) and EI ($F(2, 192) = 36.06$, $p < 0.001$, $\eta^2 = 0.27$) and a significant interaction effect ($F(4, 192) = 3.11$, $p = 0.017$, $\eta^2 = 0.06$). There were significant simple effects of EI in each sensitivity group (low, medium, high). Details are shown in Table 4.

The UNIANOVA analysis examining the interaction effect of SPS and EI on the disengagement burnout factor showed significant main effects of SPS ($F(2, 192) = 5.91$, $p = 0.003$, $\eta^2 = 0.06$) and EI ($F(2, 192) = 12.97$, $p < 0.001$, $\eta^2 = 0.12$) and a significant interaction effect ($F(4, 192) = 3.26$, $p = 0.013$, $\eta^2 = 0.06$). There were 2 significant simple effects of EI in the low and medium sensitivity groups. However, in the highly sensitive group, EI did not influence disengagement. Details are shown in Table 4.

DISCUSSION

The study aimed to analyze the influence of the temperamental trait SPS and the ability of EI on the occurrence of professional burnout among Polish dentists. The re-

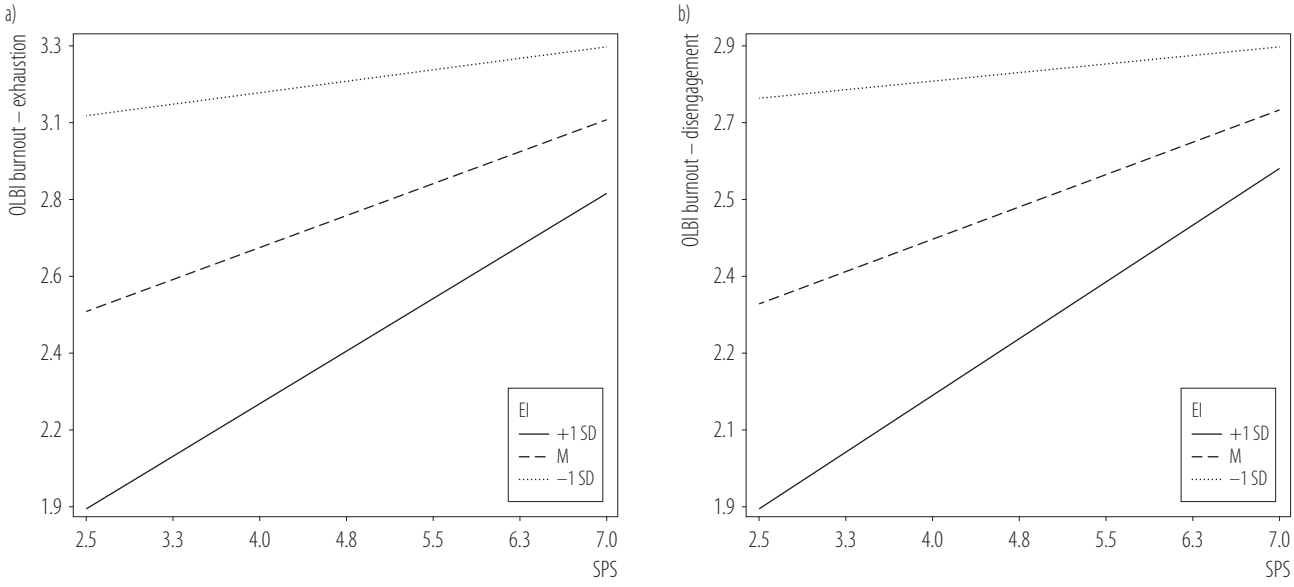

Figure 1. Interactive effects of emotional intelligence (EI) and sensory processing sensitivity (SPS) on *Oldenburg Burnout Inventory* (OLBI) burnout a) exhaustion and b) disengagement in the study among the population of Polish dentists (N = 201), online survey, Poland, 2023

sults showed a significant and positive relationship between SPS and job burnout with moderate coefficients of correlation. These results confirm the results of previous research on the influence of SPS on dentists [23]. The explanation for this relationship may be the faster depletion of personal resources among highly sensitive dentists in response to stressful situations at work (in accordance with JD-R model) [17]. The authors' study results did not confirm previously reported [23] association of higher scores on the SPS AES subscale with lower levels of burnout. However, this study found a positive correlation between AES and EI, although the effect was very weak. Additionally, the authors wanted to check whether EI could be a protective factor against burnout in highly sensitive

Table 4. UNIANOVA results – simple effects of emotional intelligence on burnout factors in low, medium and high sensory processing sensitivity groups in the study among the population of Polish dentists (N = 201), online survey, Poland, 2023

Variable	M	SE	95% CI	F	p	η^{2a}	Effect size[a]
Exhaustion							
low SPS (N = 65)	2.68	0.065	2.55–2.81	35.03	<0.001	0.27	large***
medium SPS (N = 80)	2.79	0.054	2.68–2.89	17.71	<0.001	0.16	large***
high SPS (N = 56)	3.09	0.073	2.94–3.23	4.60	0.011	0.05	small*
Disengagement							
low SPS (N = 65)	2.47	0.067	2.34–2.60	18.21	<0.001	0.16	large***
medium SPS (N = 80)	2.50	0.056	2.39–2.60	9.24	<0.001	0.09	medium***
high SPS (N = 56)	2.78	0.076	2.63–2.93	1.23	0.295	0.01	small

SPS – sensory processing sensitivity.
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.
[a] Interpretation of η^2: 0.01 – small, 0.06 – medium, 0.14 – large [50].

dentists. The study results confirmed previous research on the relationship between EI and burnout [30–33]. This relationship turned out to be negative and significant and the coefficient of correlation was high. This suggests that by increasing one's EI, one could gain more resources to cope with stress and demands at work, which might translate into a lower risk of burnout.

The authors obtained interesting results in the analysis of the moderation of the EI trait on the SPS–burnout relationship. It turned out that EI significantly and strongly reduces burnout symptoms only among dentists with low and medium SPS scores. Among the highly sensitive dentists, the protective effect of EI decreases for exhaustion and disappears for disengagement. However, in the latter case the result achieved marginal significance ($p = 0.066$). It is possible that with a larger sample the result for disengagement would turn out to be significant as well. These findings illustrated reverse buffering effect. Emotional intelligence is not a sufficient factor to protect highly sensitive dentists from burnout. This shows the importance of searching for other possible factors that could help highly sensitive dentists deal with burnout.

In the study population 59.7% of dentists showed a high level of exhaustion, and 29.4% had a medium level of exhaustion (according to the Polish population norms [41]). A high level of disengagement was shown by 41.3% of the dentists, and 42.8% had a medium level of disengagement. These results show that burnout is still a current problem in this profession. For comparison, a recent study on another Polish medical professional group showed that 36% of nurses had a high level of exhaustion and 38% had a high level of disengagement [43]. Preventing job burnout is important for dentists' well-being and the quality of health care they provide. Studies show that burnout can lead to depressive symptoms among dentists [44]. Job burnout is associated with absenteeism [45] and doctors' perceptions of providing poorer quality patient care [46]. Research also shows that clinicians suffering from burnout make more medical errors [47]. In summary, this translates into poorer quality of health care overall.

CONCLUSIONS

The study showed that the vast majority of dentists suffer from job burnout and those with the SPS trait are at a higher risk. This knowledge may lead to increased awareness of the risk of burnout and earlier implementation of preventive measures. The ability of EI has proven to be a promising way to reduce professional burnout, although it appears to be insufficient among those at higher risk, i.e., the highly sensitive dentists. This opens the door to exploring other ways that can help highly sensitive dentists practice their profession with full commitment.

Emotional intelligence is both a trait and an ability, which can be trained and increased [35]. This study results show the importance of training aiming at increasing EI among dentists and dental students. Literature provides ways to develop EI skills [48,49].

No study is without limitations. The study sample was based on voluntary participation and recruited for by social media, so it is possible that this type of study could attract only dentists interested in the topic of mental well-being or potentially result in the overrepresentation of respondents with higher levels of burnout or SPS. Additionally, there are many organizational factors that could impact the results, e.g., type of employment or organizational culture of the workplace.

Author contributions

Research concept: Beata Pszczółkowska, Sylwiusz Retowski

Research methodology: Beata Pszczółkowska, Sylwiusz Retowski

Collecting material: Beata Pszczółkowska, Sylwiusz Retowski

Statistical analysis: Beata Pszczółkowska, Sylwiusz Retowski

Interpretation of results: Beata Pszczółkowska, Sylwiusz Retowski

References: Beata Pszczółkowska, Sylwiusz Retowski

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