

Burnout, well-being, and self-reported medical errors among physicians

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KEY WORDS

burnout, errors, patient safety, suicidal ideation, well-being

EDITORIAL

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ABSTRACT

INTRODUCTION In recent years, healthcare systems around the world have been subject to profound changes driven by advances in technology, new regulations as well as demographic and societal trends. This volatile and stressful environment has had its consequences for healthcare organizations and their employees. The resulting phenomena of burnout or lowered well-being may affect key aspects of healthcare delivery on individual, organizational, and financial levels.

OBJECTIVES The objective of this paper was to investigate the level of burnout and well-being in a group of Polish physicians, its impact on errors, and associations with other factors.

METHODS This was a cross-sectional survey using a self-administered questionnaire with 65 questions and validated tools such as the Maslach Burnout Inventory and the World Health Organization–5 Well-being Index (WHO-5). Correlations between variables were investigated using Spearman rank correlation analysis. Univariable and multivariable logistic regression models were used to evaluate predictors of burnout and errors. The study included residents and physicians of various specialties.

RESULTS A total of 125 residents and physicians, mostly internists and cardiologists, participated in the study, out of which 84 (67%) were found to be burned out. The median WHO-5 score was 40 points. Two-thirds of all physicians admitted to making an error in the last 3 months, which was strongly associated with burnout.

CONCLUSIONS The level of burnout among respondents was high and had numerous negative consequences that may affect the entire healthcare system. The results suggest there is an urgent need to address the problem of burnout among physicians.

INTRODUCTION New technologies, regulations as well as demographic and societal trends in recent years have driven considerable changes in healthcare systems. This has resulted in an unstable and stressful environment impacting healthcare organizations and employees with burnout being one of the consequences. A growing number of studies indicate that the impact of burnout is so profound that more and more organizations and academics call for a need to rethink the way healthcare systems are designed.^{1,2}

Burnout among healthcare staff has been proven by numerous studies to affect key aspects and dimensions of healthcare delivery: individual (depression, well-being, insomnia, work-life satisfaction), organizational (performance, patient safety, increased absences and turnover, patient satisfaction), or financial.^{3–5} Data from the literature

indicate that the percentage of healthcare staff struggling with burnout, physicians in particular, is alarmingly high. Studies with largest samples provide rates of 40% to 50%.⁶ A recent paper by Shanafelt et al⁷ that compared prevalence of burnout over time in a large sample of United States physicians estimated it at 43.9% in 2017, 54.4% in 2014, and 45.8% in 2011.

Medical errors have been common across healthcare systems for decades. Although some early studies have estimated their prevalence to be quite high,^{8,9} it was not until 1999 when the Institute of Medicine published a report entitled *To Err Is Human: Building a Safer Health System*¹⁰ that the phenomenon gained widespread attention and initiated systemic actions aimed at improving patient safety. Subsequent research confirmed incidence of errors to be around 5% to 10%

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WHAT'S NEW?

This is to our best knowledge the first study from Poland to investigate associations between physician burnout, well-being, and errors. Although our findings confirm research known from other countries, they may suggest that the problem in Poland may be particularly serious. Two-thirds of respondents committed an error in the last 3 months and 10% of them caused a major and permanent morbidity while another 5% led to patient death. We classified 67% of the surveyed physicians as burned out, and burnout was found to increase odds of making an error more than 5-fold—and these numbers speak for themselves. Another disturbing finding is that 13.7% of physicians had suicidal ideation within the last 12 months. Although the study was conducted prior to the COVID-19 pandemic, it is almost certain that the new pandemic-related reality may only make the problem more serious.

of hospital stays.¹¹⁻¹³ However, despite many efforts to reduce preventable patient harm, there has been no substantial improvement in safety of care.^{14,15} Only in 2019, the World Health Organization (WHO) concluded that “global efforts to reduce the burden of patient harm have not achieved substantial change over the past 15 years”¹⁶ adding that there is a need for more intangible determinants of patient safety and a more integrated, system-based view of safety. As growing amount of research suggests that burnout or lowered well-being may adversely affect patient safety, one may wonder whether they may be the missing link in the endeavor for improving safety of medical care.

The 2020 global coronavirus pandemic is a new and unexpected source of stress for physicians and healthcare staff that will inevitably take further toll on their professional and personal lives.

The aim of this study was to evaluate the level of burnout and well-being among physicians and investigate their impact on self-reported errors. To the best of our knowledge, this is the first such study in Poland.

METHODS The study was a cross-sectional study using a self-administered questionnaire conducted between April 2019 and February 2020 among physicians and residents of various specialties participating in cardiology or rheumatology professional courses (TABLE 1). It consisted of 65 questions and the participation was voluntary. The total number of respondents was 125 with a response rate of 89%. Although some questionnaires were administered in February 2020, which was the time when the global pandemic of coronavirus was starting to unfold, it was not until March 4 that the first case was reported in Poland. Thus, one may assume that the pandemic did not affect the results in any way.

Ethics The ethical approval was not required for the study since the questionnaires were entirely anonymous and did not include any medical or patient data. Participants were informed about the purpose; however, they were told that

it referred to the well-being of physicians and the term *burnout* was not mentioned to avoid additional bias.

Study measures **Burnout** The 22-item Maslach Burnout Inventory–Human Services Survey for Medical Personnel (MBI) was used to evaluate burnout. It investigates the level of emotional exhaustion (EE), depersonalization (DP), and personal accomplishment (PA). The total score of each dimension was classified as either low, moderate, or high and a high score in either EE or DP was considered as burnout.¹⁷

Fatigue and well-being The respondents were asked to self-evaluate their fatigue using a scale from 0 (as bad as it can be) to 10 (as good as it can be) which was previously used in other studies.^{18,19} The level of well-being was evaluated using the WHO-5 Well-being Index (WHO-5).²⁰ This is a widely used tool found relevant not only as a well-being measure but also a screening tool for depression. The score of 50 points or less was used as a cutoff to indicate reduced well-being, and 28 point or less to indicate depression, which is in line with many other studies.²¹ We also asked one question about having suicidal ideation within the last 12 months.

Errors The following question was used as an error measure: “Are you concerned you have made an error in the last 3 months?” An error was defined as “commission or omission with potentially negative consequences for the patient that would have been judged wrong by skilled and knowledgeable peers at the time it occurred, independent of whether there were any negative consequences.” Such measures were often used in other studies referring to physicians and errors.^{19,22,23}

Statistical analysis Statistical analysis was performed using Statistica, version 13 (StatSoft Inc, Tulsa, Oklahoma, United States). The distribution of data was verified using the Shapiro–Wilk test. Continuous variables with normal distribution were presented as means (SD) and those with nonnormal distribution, as medians and interquartile ranges (IQRs). Nominal variables were presented as numbers and percentages. The χ^2 test or the χ^2 test with Yates correction was used for comparisons of nominal variables. Correlations between variables were investigated using Spearman rank correlation analysis. Univariable and multivariable logistic regression models were used to evaluate predictors of burnout and errors. The multivariable regression model of error prediction included items that were associated with errors in the univariable analysis. A *P* value of less than 0.05 was considered statistically significant.

RESULTS The median (IQR) age of respondents was 32 (29–40) years (average, 35.4 years) which was substantially lower than the average of 52 years for all physicians in Poland in 2017.²⁴

The respondents were most commonly from cities with almost equal number of specialists and residents, mainly cardiologists and internists (TABLE 1). The median well-being score was 40 points, which is below the 50-point cutoff value that indicates low well-being (71% had a score of ≤ 50), and 38% of the respondents scored 28 points or less, which indicated high risk of depression. A total of 17 (13.7%) out of 124 respondents who answered the question admitted to having suicidal ideation within the last 12 months. Almost two-thirds (63.7%) of the physicians said they committed a self-perceived error in the last 3 months with almost 80% of replies described as wrong diagnosis or wrong judgment. While the vast majority of all errors had no or little effect on the patient, as much as 10% resulted in major and permanent morbidity, and another 5% (4 cases out of 79) resulted in patient death (TABLE 1).

More than half of physicians in our study had a high score on the DP (52.4%) or EE (51.6%) subscales which translated into 67% of all respondents meeting the criterion of having burnout (TABLE 2). The average EE and DP were 26.7 and 10.8 points, respectively. We found a strong correlation between well-being and EE ($\rho = -0.70$; $P < 0.001$), and considerably weaker correlation with DP ($\rho = -0.26$; $P = 0.003$). PA scores correlated positively with well-being ($\rho = 0.49$; $P < 0.001$). Physicians at a high risk of depression were also very likely to be burned out (87%).

In the univariable analysis, the odds of making an error were significantly higher not only among physicians with overall burnout (odds ratio [OR], 5.33; $P < 0.001$) but also among those scoring high on 2 of the Maslach burnout subscales independently (OR, 8.02 for DP; $P < 0.001$; OR, 2.42 for EE; $P = 0.02$). High score on the DP scale was the strongest single predictor of errors (TABLE 2). Other variables found to be strongly and positively associated with errors were low well-being (OR, 2.26; $P = 0.045$) and being a resident (OR, 2.85; $P = 0.008$). We also found a relationship between the age of a physician and risk of error: each year of age decreased risk of errors by approximately 5% (OR, 0.95; $P = 0.02$). However, most of these variables failed to reach significance in the multivariable logistic regression model which showed that only male gender and burnout were predictors of self-reported errors (OR, 2.88; $P = 0.03$; and OR, 3.81; $P = 0.01$, respectively).

The fact of making an error was not associated with the well-being of physicians as average well-being scores were similar in both groups.

DISCUSSION Burnout The reported prevalence of overall burnout among physicians at 67% is very high; however, matching it with other studies is somewhat challenging and may be confusing as the recent systematic review of 182 papers on burnout prevalence by Rotenstein et al⁶ found the rates to range between 0% to 80.5% with 47 distinct definitions of overall burnout based just

on the MBI. Studies reviewed by Rotenstein et al⁶ with the matching instrument (MBI-HSS) and overall burnout criteria as ours (score of ≥ 27 on EE or ≥ 10 on DP) provide a range of 25% to 60.1% with a weighted average of 49.1%. However, none of the 182 papers included in the review was conducted in Poland. In a systematic review by Zgliczyńska et al,²⁵ we identified 5 papers on burnout prevalence among Polish physicians that used the 22-item MBI. Although none of them reported the overall burnout rate, 3 reported the average score for some subscales. The average EE scores of 21 points,²⁶ 27 points,²⁷ and 22 points²⁸ were slightly lower or close to 26.7 points in our study. The same refers to the average EE scores of 9 points^{26,27} and 10 points²⁸ compared with 10.8 in our respondents. Another 2 studies^{29,30} provided percentage of high scores on EE (52% and 48%, respectively) or DP (35% and 34%, respectively). The results for EE were almost identical to the ones in our study, however, the results for DP were significantly lower compared with our data (51% for EE and 52% for DP).

The high prevalence of burnout in the study may to some extent be attributed to the Polish healthcare system model and features. According to the most recent data from the Organisation for Economic Co-operation and Development,³¹ Poland has the lowest number of practicing physicians per 1000 population (2.4), one of the highest numbers of consultations per physician annually (3197), and one of the lowest expenses per capita and relative to GDP (6.3%) in the European Union. Provision of health services relies upon a highly regulated monopolistic public payer that finances a network of public hospitals. The role of the private sector is limited primarily to outpatient treatment. Such picture seems to correspond with the latest and comprehensive model of burnout contributory factors in which external environment (regulations, policies) and work system factors (excessive workload, workflow, administrative burden) are the first to blame.² The most frequently indicated sources of work frustration in our study, bureaucracy (by 94.7% of respondents) and organization of healthcare system (by 89.4% of respondents), seem to be in line with such reasoning (TABLE 1). These factors were also much more frequently indicated as sources of frustration by respondents with burnout than ones without it ($P = 0.08$ and $P = 0.03$, respectively). Last but not least, we did not identify any significant individual factors that would predict burnout such as age, sex, having children, marriage/informal relationship, number of night shifts or jobs (TABLE 3). The underlying cause of this may be that the overall burnout rate was very high and in fact referred to the large majority of the study group which may have obscured some associations.³² Nevertheless, it may also be associated with the mentioned model of contributory factors in which individual factors have the least impact on fostering burnout among physicians.

TABLE 1 Respondent characteristics (continued on the next page)

Variable		Value
Gender (n = 122)	Female	72 (59)
	Male	50 (41)
Age, y, median (IQR) (n = 123)		32 (29–40)
Professional status (n = 122)	Specialist	57 (46.7)
	Resident	65 (53.3)
Specialization (n = 121)	Cardiology	44 (36.4)
	Internal medicine	38 (31.4)
	Anesthesiology	15 (12.4)
	Rheumatology	12 (9.9)
	Other	12 (9.9)
Place of work (n = 122)	Rural area	2 (1.6)
	Small town ($\leq 20\,000$)	5 (4.1)
	Town (20 001–100 000)	24 (19.7)
	City (100 001–500 000)	44 (36.1)
	Large city ($\geq 500\,001$)	47 (38.5)
Number of jobs (n = 125)	1	69 (55.2)
	2	41 (32.8)
	3	14 (11.2)
	4	1 (0.8)
Hours worked weekly, mean (SD) (n = 121)		60 (15)
Night shifts monthly, n, median (IQR) (n = 124)		5 (3–7)
Marital status (n = 124)	Married	75 (60.5)
	Single	35 (28.2)
	Informal relationship in a common household	12 (9.7)
	Divorced/separated	2 (1.6)
Children (n = 125)	0	77 (61.6)
	1	15 (12)
	2	24 (19.2)
	3	7 (5.6)
	≥ 4	2 (1.6)
WHO-5 score, median (IQR) (n = 121)		40 (20–56)
Committed error in the last 3 months (n = 124)		79 (63.7)
Type of error (n = 73)	Wrong judgment	39 (53.4)
	Wrong diagnosis	19 (26)
	Medication error	8 (11)
	Wrong patient	4 (5.5)
	Technical error during procedure	3 (4.1)
Outcome of error (n = 79)	Minor and temporary morbidity	31 (39.2)
	No effect on the patient	28 (35.4)
	Major and permanent morbidity	8 (10.1)
	Major and temporary morbidity	7 (8.9)
	Death of the patient	4 (5.1)
	Minor and permanent morbidity	1 (1.3)
Suicidal ideation in the last 12 months (n = 124)		17 (13.7)
Are you satisfied with salary? (n = 123)	No	70 (56.9)
	Yes	53 (43.1)

TABLE 1 Respondent characteristics (continued from the previous page)

Variable	Value
Sources of frustration at work (n = 94) ^a	
Bureaucracy	89 (94.7)
Organization of healthcare system	84 (89.4)
Restrictions imposed by the payer	70 (74.5)
Organization of work	68 (72.3)
Insufficient funds for treatment	58 (61.7)
Patient demands	44 (46.8)
Lack of training	39 (41.5)
Cooperation with supervisor	24 (25.5)

Data are presented as number (percentage) unless otherwise indicated.

^a Answers “yes” and “rather yes” were summed.

Abbreviations: IQR, interquartile range; WHO-5, World Health Organization–5 Well-being Index

TABLE 2 Self-reported errors predictors: univariable and multivariable logistic regression results

Variable	Number of exposed, n (%)	Univariable		Multivariable	
		OR (95% CI)	P value	OR (95% CI)	P value
Burnout (high EE or DP)	84 (67.2)	5.33 (2.36–12.03)	<0.001	3.81 (1.37–10.59)	0.01
High EE (≥27)	64 (51.6)	2.42 (1.14–5.13)	0.02	–	–
High DP (≥10)	65 (52.4)	8.02 (3.43–18.78)	<0.001	–	–
Low PA (≤32)	58 (46.4)	2.06 (0.97–4.37)	0.06	–	–
Low well-being (≤50)	88 (70.4)	2.26 (1.02–5.00)	0.045	1.32 (0.45–3.94)	0.62
Risk of depression (well-being ≤28)	47 (37.6)	0.87 (0.41–1.85)	0.72	–	–
Suicidal ideation in the last 12 months	17 (13.7)	5.12 (1.11–23.54)	0.04	4.44 (0.52–37.63)	0.17
Male gender	50 (41)	2.21 (1.00–4.85)	0.049	2.88 (1.13–7.33)	0.03
Residents	67 (54)	2.85 (1.32–6.16)	0.008	1.55 (0.40–6.01)	0.53
Age (increase by 1 year)	–	0.95 (0.91–0.99)	0.02	0.97 (0.82–1.04)	0.37

Abbreviations: DP, depersonalization; EE, emotional exhaustion; OR, odds ratio; PA, personal accomplishment

TABLE 3 Univariable logistic regression analysis of burnout predictors

Variable	Number of exposed, n (%)	OR (95% CI)	P value
Male gender	50 (40.9)	1.71 (0.77–3.77)	0.19
Residents	67 (54)	2.14 (1.00–4.58)	0.05
Having children	51 (42.1)	0.51 (0.24–1.10)	0.18
Being in a relationship	87 (70.2)	0.55 (0.23–1.32)	0.18
Age (increase by 1 year)	–	0.97 (0.93–1.01)	0.13
Number of jobs (increase by 1)	–	1.41 (0.81–2.45)	0.22
Number of night shifts (increase by 1)	–	1.08 (0.94–1.25)	0.26

Abbreviations: see [TABLE 2](#)

Errors The percentage of respondents who admitted to committing error in the last 3 months was substantially higher than in similar studies with 10.5% reported by Tawfik et al,¹⁹ 14.7% by West et al³³ (among residents only), or 8.9% by Shanafelt et al.²³ This difference may to some extent be explained by definitions of errors as the mentioned studies investigated *major error* not just *error* used in our study. The comparable rate (61.3%) of errors not specified as only *major* was found by O'Connor et al³⁴ among Irish junior doctors. The incidence of different types of errors ([TABLE 1](#)) was comparable^{19,23,33} while the

incidence of errors leading to patient death was roughly identical at 5% as in recent studies or reviews^{19,35} as well as in a pioneer work in this field.⁹ The studies investigating prevalence of physician errors in Polish hospitals are scarce; however, some of the existing ones confirm that the problem is relevant.^{13,36}

The relationship between burnout and errors has been confirmed by numerous studies. However, it is important to distinguish between self-reported and objective errors as associations usually refer to the former. Studies that investigated correlations between objective errors and burnout

usually found weaker or no correlations at all. In the review by Hall et al,³⁷ 5 out of 30 studies did not report any associations between burnout and error with all of them referring to objective errors such as reported adverse events or medication errors. There seems to be an inevitable discrepancy in sensitivity of objective and self-reported errors. The latter are obviously much more general in their nature and include an incomparably larger number of all kinds of mishaps, omissions, wrong judgments or near-misses that are difficult or even impossible to define according to strict, objective rules. Also, resources that are necessary to identify objectively defined errors (eg, charts review), compromised anonymity, or simply complexity of medical care make it further difficult to identify such errors and investigate their associations with other factors. In this context—world of complex medicine with limited resources—anonymously self-reported errors may be considered, perhaps not ideal, but a useful patient safety indicator. The study by O'Neil et al³⁸ that concurrently compared errors reported by physicians and errors identified in medical charts in a hospital revealed that approximately 45% referred to the same patients. The former were, however, more frequently considered preventable and cost incomparably less to identify. The strength of the association between burnout and self-reported errors in the study (OR, 5.33 in the univariable model and OR, 3.81 in the multivariable model) was noticeably greater than the overall OR of 2.72 (95% CI, 2.19–3.37) in a recent meta-analysis that investigated relations between burnout and self-reported errors in 13 studies and over 20 000 physicians.³⁹

The representative well-being score according to the WHO-5 for Polish population is 63 points⁴⁰ which is far more than the median score of 40 points among our respondents. This result is also low compared with physicians from countries measured with the same tool. In the study from Ireland, low well-being (<50 points) referred to 49.5% of physicians, while 22.2% were at risk of depression.⁴¹ Although we found associations between low well-being and errors (OR, 2.14), the multivariate analysis proved it to be statistically insignificant, which was inconsistent with some studies that linked well-being to patient safety^{33,42}—and consistent with other studies.^{43,44} These discrepancies may partially be related to a cross-sectional, observational design of most studies and unknown direction of these associations.

Many countries have been found to have higher risk of suicide among physicians compared with the general population.⁴⁵ The rate of suicidal ideation within the last 12 months at 13.7% in our respondents is higher than in physicians from some countries, such as 6.9% among American physicians¹⁹ or 11.1% in Norway;⁴⁶ however, comparable with studies from Italy or Sweden (14.3% and 13.7% respectively).⁴⁷ We found that suicidal ideation and burnout were strongly associated as all of the respondents admitting to suicidal ideation

had burnout at the same time. Not even high risk of depression matched this as in this case the rate was 64.7%. This is another indication that lower well-being rates among physicians, in general, may also be related to professional factors. A recent study by Loas et al⁴⁸ who investigated suicidal ideation in a large group of physicians from Belgium concluded that dissatisfaction in the workplace was the strongest predictor of suicidal ideation. A positive correlation between burnout and suicidal ideation was also found by Dyrbye et al⁴⁹ in American students of medicine (OR, 3.46; 95% CI, 2.55–4.69; $P < 0.001$). According to the global WHO data, Poland with 13.4 suicides per 100 000 population ranks close to the global (10.2) or European (15.4) averages.⁵⁰

In general, the results of our study are consistent with many studies from other countries carried out in recent years, or even decades in some cases. What stands out is the magnitude and strength of some of the findings.

This study is subject to certain limitations. The first and major one is the relatively small and unrepresentative sample. This may explain why some of the observed associations were statistically insignificant or with wide confidence intervals. There was also an overrepresentation of residents which may have to some extent affected the results. Nevertheless, the high response rate makes it less prone to response bias and the major conclusions are consistent with other major studies. Another limitation is also the cross-sectional design of the study that cannot determine the causality between variables. Thus, we cannot say what is more likely: for example, whether errors lead to burnout or burnout leads to errors. This question remains largely unanswered as there is still a need for longitudinal studies to investigate associations between burnout and errors. This is to our best knowledge the first study investigating associations between burnout and errors in Poland. Nevertheless there is a need for larger sample studies to confirm our observations. This need seems even more urgent in the light of the 2020 COVID-19 pandemic that is almost certain to adversely affect physicians.

Conclusions The burnout rate among Polish physicians is alarmingly high and correlates strongly with self-reported errors. The individual subscales of burnout were also independently associated with self-reported errors with depersonalization being the strongest variable in the study. The average well-being level of physicians is below the 50-point threshold considered to reflect low well-being with almost 14% admitting to suicidal ideation. The rate of self-reported errors is also very high and as much as 5% of those may lead to patient death. The results suggest that there is an urgent need for action aimed at tackling the problem of burnout in Polish hospitals as it may seriously affect not only the overall level of patient safety but also the well-being of physicians.

ARTICLE INFORMATION

CONTRIBUTION STATEMENT All authors were responsible for the design of the study. MM and JO analyzed the data. All authors interpreted the data and performed the final revision of the manuscript.

CONFLICT OF INTEREST None declared.

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