

Relationship between Job Satisfaction, Burnout, and Depressive Symptoms in Physicians: A Cross-sectional Study based on the Employment Demand Control Model

David Villarreal-Zegarra

Instituto Peruano de Orientación Psicológica

Wilder Iván Lázaro-Illatopa

Instituto Peruano de Orientación Psicológica

Ronald Castillo-Blanco

Universidad del Pacífico, Gestión del Aprendizaje y Aseguramiento de la Calidad

Baltica Cabieses

Universidad del Desarrollo

Alice Blukacz

Universidad del Desarrollo

Luciana Bellido-Boza

Universidad Peruana de Ciencias Aplicadas

Edward Mezones-Holguin (✉ emezones@gmail.com)

Universidad San Ignacio de Loyola

Research Article

Keywords: mental disorders, burnout syndrome, depressive symptoms, job satisfaction, job demand-control framework

Posted Date: August 3rd, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-753962/v1>

License:  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

We evaluated the relationship between job satisfaction, burnout syndrome, and depressive symptoms among Peruvian physicians using the job demand–control framework. We carried out a secondary data analysis of the National Survey of Satisfaction of Users in Health 2016 in Peru. The first part was based on the association among the variables based on the job demand–control framework. The second part focused on estimating the acceptability of the proposed model based on the study variables through the structural equation modeling technique. A total of 2,100 physicians were included, and the prevalence of depressive symptoms was 3.3%. Physicians who had a work-related illness were more than twice as likely to have depressive symptoms (PR=2.23) compared with those who did not. The first predictive model based on the variables, depressive symptoms, burnout syndrome, and job satisfaction had a low goodness-of-fit index. Therefore, for a second evaluation, models with correlated errors were considered, and optimal goodness-of-fit indices were found (CFI=0.974; RMSEA=0.060). Our study identified a stable model to explain the relationship between job satisfaction, burnout, and depressive symptoms among physicians. The results are consistent with the job demand–control framework and can be applied to decision making in occupational contexts in Peru.

Background

There is evidence indicating that the risk of developing common mental disorders can be associated with work-related factors, such as high job demands, low job control, high effort–reward imbalance, low relational justice, low procedural justice, role stress, bullying, and low social support¹. In the context of a particularly physically and mentally straining line of work, the mental health of health care workers has received increased attention in the last few decades. Evidence at the international level shows that health professionals are at a higher risk of developing common mental disorders, such as anxiety and depression, than the general population² and have a high prevalence of mental health issues ranging from work-related fatigue, stress, and post-traumatic stress disorder³ to suicide ideation and attempt^{4,5}.

Literature on the topic from Europe and Latin America focused on burnout syndrome in physicians⁶⁻⁸, and several studies carried out in Peru indicated a high prevalence of the syndrome⁹⁻¹¹ and its dimensions¹². Burnout syndrome is characterized by emotional exhaustion, depersonalization, and a lack of personal accomplishment¹³ and has been identified as one of the main work-related mental health issues affecting physicians. However, there are limitations to its assessment since it is a self-reported outcome, and there are no standardized cutoff points globally, which explains why the prevalence of burnout syndrome is very heterogeneous among physicians (0%–85%)¹⁴. Additionally, burnout syndrome is moderately associated with other mental health disorders, such as depression and anxiety, and although they share similar characteristics (i.e., loss of interest and anhedonia), they are different mental health issues that need particular attention¹⁵.

Regarding the factors influencing poor mental health outcomes among health care workers and physicians, existing evidence suggests that a number of them are directly work related¹⁶. These include working at emergency services, dealing with the patients' suffering and death, dealing with increased risk of infection¹⁷, or organizational factors, such as work overload, tensions between personal and institutional values¹⁸, inadequate quality of health care, and low professional autonomy¹⁹. More specifically, job satisfaction is a complex and multidimensional concept that can be defined as "the positive or negative attitude that an employee has towards working conditions, co-workers, the exercise of his or her profession in the work place"²⁰. It is necessary to point out that although job satisfaction is a construct based on the worker's perception, it depends directly on the actual conditions of the workplace. Job satisfaction has been found to be moderately related to the presence of mental health problems, such as anxiety, depression, or burnout syndrome²¹, and conversely, the absence of burnout has been found to be a predictor of job satisfaction²². The existing evidence seems to point toward low job satisfaction being a factor in poor mental health outcomes and burnout among physicians. Job satisfaction among health care workers is crucial to public health, as it has been shown to reduce absenteeism-related costs and improve patient treatment care and satisfaction²³. Hence, promoting high levels of job satisfaction among physicians is an essential aspect of ensuring that health care systems can deliver appropriate and safe care, thus improving overall public health²⁴.

In recent years, several theoretical models have been put forward to define and explain the relationship between burnout syndrome, job satisfaction, and depression. However, empirical evidence remains scarce, and the few available studies are cross-sectional. Furthermore, the lack of a unified measurement instrument across countries limits existing interpretations¹⁵. Contrarily, different theoretical frameworks have attempted to explain the relationship between working conditions and work-related variables in mental health. One of the most critical of these frameworks is the job demand–control model, which predicts that "individuals with high-strain jobs characterized by high demands and limited control (decision authority and skills discretion) and possibly poor social support in the workplace (isolated strain: iso-strain) are at high risk of developing physical illness and mental health problems"²⁵.

Some studies provided initial evidence on the structure of the relationship between the three variables, burnout, job satisfaction, and depression, in physicians and its consequences. Systematic reviews have shown that the perception of psychosocial stressors in health care facilities is related to the development of depressive symptoms in health care professionals^{25,26}, and cross-sectional studies suggest that job satisfaction is associated with occupational factors and physicians' mental health²⁷⁻²⁹. The theoretical framework is used to create predictive models in cross-sectional studies and elaborate structural equation models (SEM) to explain the relationship between burnout, job satisfaction, and depressive symptoms in physicians. Using the SEM model, a previous study in health care workers in Brazil indicated a causal relationship between these three variables, where depressive symptoms were a predictor of burnout syndrome, and the absence of this syndrome predicted job satisfaction²².

Despite the existing evidence on the relationship between job satisfaction, burnout, and depression, there is no primary evidence of this relationship in middle- and low-income countries, including Peru. Since the existing evidence on burnout among physicians in Peru indicates high prevalence¹⁰⁻¹², studying its relationship with job satisfaction and depression is imperative. Additionally, in the Peruvian health care system and socioeconomic context, inequities exist in health outcomes and access to health care^{30,31} that may not be present in high-income countries where some of the evidence on the relationship between job satisfaction, burnout, and depression have been reported. It is important to note that the Peruvian health system is fragmented and segmented between public and private health care coverage and provision, with three levels of governance: national, regional, and municipal. More than 75% of the population has public health insurance in subsidized and contributory regimes³². According to critics, despite being a pioneer at the regional level in the establishment of a National Health Services System, the Peruvian health care system is characterized by structural inefficiencies, lack of continuity in care, lack of monitoring and evaluation³³, insufficient public spending, and insufficient and geographically dispersed human resources and infrastructure³¹. Furthermore, physicians often work in more than one health care center, often sharing their working time between the public and private subsectors³⁴. Considering the systemic issues observed in the Peruvian health care system and the prevalence of burnout syndrome and mental health issues among physicians, which hinders their capacity to provide adequate services, failing to address their mental health may negatively affect population health in the long run while widening the existing gap in access to health care and adequate health insurance coverage^{32,33}.

Within this context, our study evaluated the relationship between job satisfaction, burnout syndrome, and depressive symptoms among Peruvian physicians using the job demand–control framework model. It is the first analysis of its kind in this country and has contributed to developing relevant knowledge for middle- and low-income countries in Latin America and other regions on the factors of common mental disorders among physicians. This study could also contribute to identifying solutions that would guarantee the health of health care professionals and consequently improve the overall population health.

Results

Sociodemographic characteristics

The participants' sociodemographic variables were obtained from the database. A total of 34.5% were over 50 years old. Majority of the participants were males (68.8%), earned between 4 and 10 times the minimum wage per month (66.0%), and lived with a partner (64.5%). Around half (51.8%) had a medical specialty. Of all participants, 58% reported working in other institutions. Of these, 43% worked with the Ministry of Health, 34.4% were part of EsSalud, 8.4% worked in the armed forces and national police, and 14.2% worked in private clinics. Of all participants, 23% reported a work-related illness, 30.3% reported

having a chronic illness, and 34.7% reported that they have suffered physical, psychological, or sexual violence (Table 1). The proportion of physicians with depressive symptoms was 3.3%.

Table 1

Characteristic of the participants included in the study (n=2,100).

		Overall n=2,100	Without depression symptoms n=2,020	With depression symptoms n=80	PR*
Sex	Men	1,568 (68.8%)	1,514 (68.8%)	54 (70.2%)	-
	Women	532 (31.2%)	506 (31.2%)	26 (29.8%)	1.19 [0.72- 1.95]
Age	23-29	145 (7.8%)	137 (7.7%)	8 (11.1%)	-
	30-39	656 (31.8%)	629 (31.9%)	27 (28.9%)	0.80 [0.34- 1.86]
	40-49	586 (25.9%)	564 (25.8%)	22 (28.0%)	0.74 [0.27- 2.01]
	50-65	713 (34.5%)	690 (34.6%)	23 (32.0%)	0.55 [0.18- 1.68]
Live with couple	No	646 (35.5%)	618 (35.4%)	28 (39.0%)	-
	Yes	1,454 (64.5%)	1,402 (64.6%)	52 (61.0%)	0.96 [0.58- 1.59]
With speciality	No	565 (36.3%)	540 (36.4%)	25 (33.2%)	-
	In progress	345 (11.9%)	328 (11.7%)	17 (19.0%)	1.09 [0.36- 1.04]
	Yes	1,306 (51.8%)	1,265 (51.9%)	41 (47.8%)	0.72 [0.55- 2.15]
Work in other institution	No	922 (41.6%)	878 (40.7%)	44 (67.1%)	-
	Yes	1,178 (58.4%)	1,142 (59.3%)	36 (32.9%)	0.61 [0.36- 1.03]
Monthly income	Less than four minimum wages	70 (4.3%)	67 (4.3%)	3 (3.5%)	-
	Four to ten minimum wage	1,420 (66.0%)	1,365 (66.1%)	55 (63.1%)	1.17 [0.35- 3.90]

	More to ten minimum wage	610 (29.7%)	588 (29.6%)	22 (33.4%)	1.83 [0.49-6.78]
Work-related illness	No	1,620 (76.8%)	1,574 (77.3%)	46 (61.3%)	-
	Yes	480 (23.2%)	446 (22.7%)	34 (38.7%)	2.23 [1.38-3.60]
Self-reporting having a chronic illness	No	1,548 (69.7%)	1,496 (70.3%)	52 (51.2%)	-
	Yes	552 (30.3%)	524 (29.7%)	28 (48.8%)	1.24 [0.76-2.04]
Type of organization	Ministry of Health	962 (43.0%)	915 (42.6%)	47 (55.1%)	-
	EsSalud	980 (34.4%)	951 (34.3%)	29 (36.1%)	0.67 [0.42-1.07]
	Armed forces and national police	33 (8.4%)	32 (8.7%)	1 (1.1%)	0.72 [0.10-5.39]
	Private clinics	125 (14.2%)	122 (14.4%)	3 (7.7%)	0.57 [0.17-1.90]
Years working in the institution	2 years or less	685 (36.8%)	659 (37.0%)	26 (31.6%)	-
	3 to 5 years	396 (19.4%)	377 (19.3%)	19 (22.3%)	1.35 [0.72-2.55]
	6 to 10 years	293 (12.6%)	284 (12.4%)	9 (20.0%)	1.13 [0.47-2.72]
	11 years to more	726 (31.2%)	700 (31.3%)	26 (26.1%)	1.47 [0.64-3.36]
Physical, psychological or sexual violence	No	1,393 (65.3%)	1,353 (65.6%)	40 (54.7%)	-
	Yes	707 (34.7%)	667 (34.4%)	40 (45.3%)	1.17 [1.12-2.72]

Note: Monthly income = Less than four minimum wages (\leq \$890), four to ten minimum wages (\$890 to \$2,225) or more than ten minimum wages (\geq \$2,225). The complex sampling weighting factor adjusted the percentages. * Model adjusted by sex, age, live with the couple, speciality, work in other institutions, monthly income, work-related illness, self-reporting having a chronic illness, type of

organization, years working in the institution, and physical, psychological or sexual violence. Words in bold are significant values ($p < 0.05$). RP = Prevalence Ratio.

Relationship between variables

We found that physicians who had had a work-related illness were more than twice as likely to present with depressive symptoms, compared with those who did not (PR: 2.23, 90% CI: 1.38–3.60) (Table 1). The subdimensions of burnout were strongly correlated ($|r| > 0.50$), as well as the elements of depressive symptoms ($r > 0.50$). The job satisfaction scales were moderately correlated ($r > 0.30$). The general professional activity satisfaction scale and the dimensions of burnout were moderately correlated (Table 2). Furthermore, anhedonia and the individual working conditions subdimension were moderately related to the dimensions of burnout ($|r| > 0.30$). There was a weak correlation between depressive symptoms and the three scales of job satisfaction, consistent with the job demand–control framework.

Structural regression model

The first predictive model for depressive symptoms, burnout syndrome, and job satisfaction variables (Figure 2) presented a low goodness-of-fit index. This led to assessing the possible models with correlated errors, and we found that the errors of individual conditions and health services management were highly related. Hence, we decided to assess a second model taking into account these correlated errors (see Figure 2), and we found optimum goodness-of-fit indices (CFI = 0.974; TLI = 0.961; SRMR = 0.045; RMSEA = 0.060 (Table 3).

Table 3

Designs of Structural equation models (n=2,100).

	χ^2 (df)	CFI	TLI	RMSEA [90%CI]	SRMR
Model 1	138.2 (25)	0.883	0.832	0.125 [0.105-0.146]	0.070
Model 2	52.2 (24)	0.974	0.961	0.060 [0.038-0.083]	0.045

Note: χ^2 = chi-squared; df = degree freedom; CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root-mean-square error of approximation; 90%CI = 90% confidence interval; SRMR = Standardized root mean square residual. The model values considered the weighting factor of the complex sample.

Our study established an explicative model in which job satisfaction negatively predicted burnout syndrome, and burnout predicted the presence of depressive symptoms (Figure 2). This means that physicians who had low satisfaction with working conditions, health services management, or their general professional activity were at a higher risk of developing burnout syndrome. In other words, they would display higher levels of depersonalization and emotional exhaustion and lower levels of personal

accomplishment. These elements of burnout influenced the presence of depressive symptoms. This explicative model explained the relation between emotional issues, such as depressive symptoms, and organizational variables based on the job demand–control framework.

Discussion

Main findings and significance of the results

Our results support the hypothesis that job satisfaction influences burnout and that burnout influences the presence of depressive symptoms among physicians in Peru. These results are consistent with the job demand–control framework, which suggests that high levels of tension in the workplace and demanding working conditions for workers who may or may not have tools to control this demand put them at a high risk of work-related illness. When demands exceed control capacities, accidents may happen, and illnesses may be caused^{35,36}. Specifically, our study showed that with demands of the work environment and working conditions represented by the three scales of job satisfaction influenced the physician's capacity for control and individual autoregulation, which was assessed by the burnout scale. In turn, burnout influences the presence of depressive symptoms among physicians in Peru. This provides evidence of a relationship between the three variables and the relevance of this model for mental health disorders, such as depressive symptoms.

Explanation of the plausibility of findings

Several studies have found causal mechanisms to explain the relationship between the variables of job satisfaction, burnout syndrome, and depressive symptoms^{25,37}. Among the main mechanisms are the factors linked to work conditions. First, the variables related to work conditions are tightly interrelated and linked to job satisfaction³⁸. This explains why job satisfaction regarding health services management and the individual working conditions of the health care center, which are highly correlated, were identified in our study. Second, there is evidence that work conditions like work overload, mismanagement, and inadequate work environment^{25,37} are essential factors in burnout prevalence. Third, there is plenty of evidence supporting the relationship between burnout and depressive symptoms, as the former predisposes one to negative affective feelings, such as sadness and anhedonia [15], potentially initiating clinical depression. Fourth, failure to treat problems in the work environment, in a timely manner, would lead to burnout syndrome and subsequently, the appearance of depressive symptoms^{25,37}. Finally, there is evidence that the demand–control framework explains the relationship between job satisfaction, burnout, and depressive symptoms. Therefore, it is a valuable framework that could be used within the Peruvian context to explain depressive symptoms among physicians^{25,33}.

Contrasting findings within existing literature

Ensuring that health professionals feel satisfied with their work environment and the work itself is crucial as it contributes to ensuring the best possible quality of care for their patients. However, hostile work conditions, inadequate management, the perception of having limited opportunities for professional and personal growth, difficulties in coping with tasks, among others, can lead to burnout syndrome. It is considered an illness, and health care providers must pay attention to it, as it affects both the health care workers and users of health services and leads to economic loss²². Thus, constant work-related stress and the inability of the employer to satisfy the needs and fulfill the rights of its workers can lead to depressive symptoms and other mental disorders. Furthermore, treating depression may span several years, resulting in financial loss^{39,40}. For this reason, it is crucial to address the root causes of depression and its symptoms, that is, the work conditions in the proposed predictive model. In this way, a range of negative consequences could be prevented at the national level, paving the way for improvement in public policies, laws, and regulations.

Relationship and comparisons between variables

Regarding sociodemographic factors associated with depressive symptoms among physicians, our study showed that the physicians who reported work-related illness were twice at risk of presenting with depressive symptoms. Other studies found that work-related illnesses, such as workplace accidents or back pain⁴¹, increased the patient's risk of developing depressive symptoms. Contrarily, age, gender, and monthly income did not show significant results. Previous studies in Peru showed that women over 75 years old and those belonging to the lowest wealth quintile are more likely to have depressive symptoms^{42,43}. If wealth is to be considered alone as a factor in depressive symptoms, it could be said that health professionals would be at a lower risk of developing depressive symptoms. Physicians receive a higher income than the national average, on average four times the minimum monthly wages, and thus have better access to mental health care and higher educational levels, all of which are protective factors for depressive symptoms⁴². However, other studies among health professionals in Brazil, China, and Finland reported that sex, educational level, age, or the specific profession (physician, nurse, or other health professionals) are not related to developing depressive symptoms^{22,29,44}, which is consistent with our results.

Structural regression model

Our results support the job demand–control framework, which shows that workers with high levels of tension (burnout) as well as unfavorable organizational conditions (low job satisfaction), are at higher risk of developing health issues, such as depressive symptoms²⁵. Research carried out in Brazil and Spain, which used models focused on job satisfaction, burnout, and depressive symptoms, found that the direct relationship between depressive symptoms and job satisfaction is minimal^{22,45}. This supports our model, as their effect is mainly mediated by burnout. The abovementioned studies have put forward other types of models. The Brazilian study that focused on health professionals suggested that depressive

symptoms predict burnout (n = 271), whereas the other study that focused on the members of the Spanish Scientific Society of Periodontology found that depressive symptoms negatively influenced personal accomplishment, which is a dimension of burnout (n = 170) ⁴⁵. However, these studies had two important limitations. First, neither of them used a framework that can explain their models, meaning that the directionality of the variables studied is not clear. Second, their respective sample size is minimal and not representative, and consequently, there may have been a selection bias. Thus, the model presented in our study represents a relevant contribution to the existing scientific literature, considering that the job demand–control framework explains the results and can be generalized to Peruvian physicians.

Strengths and limitations

The strength of our study is the representativeness. We used a sample of primary care physicians in Peru, which means that our results can be generalized to this group. However, our study had some limitations. First, the method used was cross-sectional, meaning that it is not possible to determine causality. Second, only physicians were included in the sample, excluding other health professionals, such as psychologists and nurses. Third, although validated instruments were used to avoid bias, this does not replace a clinical assessment of depression. As such, there may have been selection bias; however, the PHQ-2 is an instrument that has been shown to have high sensitivity and specificity scores ⁴⁶. Fourth, the data is from 2016, which indicates that these values may have changed in recent years. We however consider this very unlikely due to the nature of the Peruvian health care system ³³.

Implications in public health and recommendations

Peru is a lower middle-income country, and its health care system is overburdened and fragmented. Health care institutions are divided among different regulating entities and providers (Ministry of Health, EsSalud, the armed force and national police, and the private sector), with considerable disparities in terms of the resources available for health care provision. Therefore, our results are helpful for the Peruvian context but may also be relevant for other lower middle-income countries with a similar health care system. Our results showed that mismanagement, poor social support, and recognition of the needs and rights of health care professionals (low job satisfaction), and difficulties to control high job demand may lead to burnout syndrome among health care professionals. If these issues remain unresolved, there may be adverse effects on the health of Peruvian physicians, such as a higher prevalence of depressive symptoms, and this may lead to years lost to disability as well as considerable costs for the state due to the limited human resources for health, absenteeism from work, and work saturation and overload ^{33,47}. We thus recommend that policies and regulations be designed to improve the work conditions of health professionals.

Conclusion

Our study identified a stable model to explain the relationship between job satisfaction, burnout, and depressive symptoms among physicians. Policymakers could use this model to assess areas for improvement, such as working conditions. Improving management may prevent burnout syndrome and depressive symptoms among health professionals.

Methods

Study design

We carried out a secondary data analysis of the National Survey of Satisfaction of Users in Health 2016 (ENSUSALUD from the Spanish acronym) (<http://portal.susalud.gob.pe/blog/encuestas-de-satisfaccion-a-nivel-nacional-ensusalud-2016/>). This cross-sectional survey was performed by the National Institute of Statistics (INEI, from the Spanish acronym) and the National Health Authority (SUSALUD from the Spanish acronym).

Participants

Participants were selected from a complex, nationally representative, and regionally stratified probability sample. The ENSUSALUD-2016 dataset has primary and secondary unit samples of health care centers and health professionals, respectively. Physicians and nurses working (a minimum of 12 months at the time of the survey) in 185 health care centers in all regions of Peru completed the questionnaire for primary care professionals (ENSUSALUD questionnaire 2). In our study, only physician data were included. We excluded physicians older than 65 years, who did not report income levels, or had missing data on their place of work. Initially, there were 2,216 participants, but 116 cases were excluded based on the inclusion and exclusion criteria (Figure 1). Thus, 2,100 participants were included in our analysis.

Variables

Job satisfaction

Three scales were used to measure different elements of job satisfaction. These were *General Professional Activity*, *Health Services Management*, and *Working Conditions of the Health Center*. These scales presented adequate psychometric properties and were validated in an earlier study that used data from ENSUSALUD-2016⁴⁸. Job satisfaction was measured on a 5-point Likert scale ranging from 1 to 5 (5 = very satisfied; 4 = satisfied; 3 = neither satisfied nor dissatisfied; 2 = dissatisfied; 1 = very dissatisfied).

1) *Satisfaction scale on General Professional Activity*: This scale evaluated the level of satisfaction according to the general aspects of professional work, including the relationship between the patient and

health professional, professional achievements, job availability, and occupational hazard perception. The instrument had six items with one dimension (comparative fit Index [CFI] = 0.946; root mean square error of approximation [RMSEA] = 0.071; standardized root mean square residual [SRMR] = 0.035). Furthermore, the test had a high level of reliability ($\alpha = 0.70$; $\omega = 0.70$). The invariance of measurement was achieved for civil status, having a chronic disease, and people who had a work-related disease ⁴⁸.

2) *Health Services Management Satisfaction Scale*: This scale measured the level of satisfaction on management in the health care center. The scale considered the following components: satisfaction with managing human and economic resources, availability and use of medication, and alignment of tasks according to skills. The instrument consisted of eight items with one dimension (CFI = 0.972; RMSEA = 0.081; SRMR = 0.028). The test had a high level of reliability ($\alpha = 0.90$; $\omega = 0.90$), and the invariance of measurement was identified for sex, age, civil status, medical specialty, working in more than one institution, work-related illness, self-reporting of having a chronic illness, and the scheduling of health personnel shifts ⁴⁸

3) *Satisfaction Scale on the Working Conditions of the Health Center*. The instrument focused on measuring the level of satisfaction regarding working conditions. The indicators evaluated satisfaction regarding the promotion of optimal conditions, administrative regulation of the health center, workload, working schedule, income, improvement potential, infrastructure and equipment, employee–boss relationship, and health center cleaning services. The instrument consisted of 11 items with two dimensions (CFI = 0.914; RMSEA = 0.080; SRMR = 0.055). The first dimension was about individual working conditions ($\alpha = 0.81$; $\omega = 0.81$; 8 items), and the second dimension was about structural working conditions ($\alpha = 0.81$; $\omega = 0.82$; 3 items). The invariance of measurement was achieved with regards to sex, age group, marital status, medical specialty, working in more than one institution, working time, and work-related chronic illness ⁴⁸

Burnout syndrome

The Maslach Burnout Inventory: Human Service Survey (MBI-HSS) was used ⁴⁹. This questionnaire had Likert-type response scales with 22 items divided into three dimensions (CFI = 0.974; RMSEA (IC90%) = 0.052(0.048–0.055); SRMR = 0.059). However, in our exploratory factorial analysis, we found that seven items presented factorial loads lower than 0.40; hence we removed them from a second analysis, and we obtained a better fit in the model with a total of 15 items (CFI = 0.972; RMSEA (IC90%) = 0.049(0.044–0.054); SRMR = 0.047). The scale had seven answer options (0 = never; 1 = a few times a year or less; 2 = once a month or less; 3 = a few times a month; 4 = once a week; 5 = several times a week; 6 = every day). The first dimension, emotional exhaustion, had five items ($\alpha = 0.72$; $\omega = 0.79$), the second dimension, which was depersonalization, had five items ($\alpha = 0.68$; $\omega = 0.83$), and the last dimension, which was personal accomplishment, also had five items ($\alpha = 0.67$; $\omega = 0.81$) ³⁵.

Depressive symptoms

The Patient Health Questionnaire (PHQ-2) was used to evaluate depressive symptoms in the last two weeks. This questionnaire had only two items, measured on a 4-point Likert scale (0 = not at all; 1 = several days; 2 = more than half of the time; 3 = nearly every day), and the scores ranged from 0 to 6. Using three or more points as a threshold, the PHQ-2 defined depressive symptoms with good sensitivity (82%) and specificity (90%)⁴⁶.

Sociodemographic variables

Data was collected on age, sex (male and female), whether the physicians had a specialty (no, in progress, and yes), whether they worked at another institution teaching, seeing patients, or performing administrative tasks (yes or no), whether they had a chronic illness (yes or no), whether they had a work-related illness (yes or no), whether they had been victims of physical, psychological, or sexual violence in the workplace (yes or no), the type of organization in which they worked (Ministry of Health, EsSalud, armed forces and national police, or private clinics), and time spent working. Additionally, self-reported monthly income was evaluated and categorized according to the minimum wage (less than 4 times, 4–10 times, and more than 10 times the minimum wage). The minimum wage was 750 Peruvian soles (PEN), equivalent to about US\$ 222.5 as on November 2020.

Analysis

Descriptive analysis

Descriptive analysis of variables was performed, and a separate analysis was carried out for physicians with depressive symptoms (PHQ-2 scores ≥ 3 points) and for physicians without depressive symptoms (PHQ-2 scores ≤ 2 points). The analysis was adjusted by the weighting factor of the complex sampling.

Relationship between variables

A Pearson correlation was performed using a sample size weighting between the following variables: depressive symptoms (PHQ-2), burnout (MBI-HSS), and job satisfaction (three scales). These three variables were evaluated because they correspond to the theoretical framework proposed by Gray, Senabe, Naicker, Kgalamono, Yassi and Spiegel⁴⁷, and Rothenberger³⁷. Pearson's correlation coefficient was considered as effect size, considering weak ($r = 0.10$), moderate ($r = 0.30$), and high ($r = 0.50$) values⁵⁰.

The chi-square tests were used to compare the relationship between sociodemographic characteristics and the variables of interest. Adjusted prevalence ratios (PR) were calculated using generalized linear

models with robust variance estimations, assuming a Poisson distribution with log link functions⁵¹. Potential confounders included in the adjusted model were sex, age, living with a partner, having a medical specialty, working in more than one institution, monthly income, work-related illness, self-reported chronic illness, working for the Ministry of Health, EsSalud, the armed forces and national police, or a private clinic, years of work in the institution, and experiences of physical, psychological, or sexual violence.

Structural regression model

For this analysis, we used the maximum likelihood estimation with robust standard errors⁵² and Pearson matrices⁵³. We adjusted the analysis by the weighting factor of the complex sampling. Two models were evaluated based on the hypothesis that job satisfaction influences burnout syndrome, which influences depressive symptoms^{37,47,54}. The first model (model 1) evaluated the relationship between job satisfaction, burnout, and depressive symptoms. The second model (model 2) was based on model 1 but considered correlated errors between the dimensions. Because the variable had four dimensions, it was very likely that these dimensions were strongly associated, and correlated errors were found between them⁵¹. The reason for using structural regression models over bivariate models was that they allowed for a single overall analysis of the different relationships among all the variables.

Evidence has been found that job satisfaction and burnout affect the mental health of health professionals, and a model was proposed to explain the dynamics between these three variables⁵⁵, with labor dissatisfaction as the main predictor²². However, this study presents a model that explains how depressive symptoms occur in Peruvian doctors due to work dissatisfaction. This model explains a problem that persists in the health systems of several countries. Therefore, understanding this problem may help in the making of more efficient and effective interventional decisions^{22,26}.

The models were evaluated based on different goodness-of-fit indices. The comparative fit index (CFI) and Tucker–Lewis Index (TLI) were used; values were considered optimal when they were higher than 0.95. The Standardized Root Mean Square Residual (SRMR) and Root Mean Square Error of Approximation (RMSEA) with a confidence interval of 90%, both with values adequate if <0.08 ^{51,56}.

Software used

We performed the analysis according to the complex sampling in R Studio®, specifically with the packages “lavaan” [37], “lavaan.survey” [38], “semTools” [39], and “semPlot”⁵⁷.

Ethical consideration

The survey was anonymous, and no information in the database could be used to identify the participants. Hence, conducting this analysis did not represent an ethical risk for participants since there was no access to confidential data. The study did not require the approval of an ethics committee because it came from a secondary database that is open access. Therefore, no primary data collection was performed and the study did not involve an ethical risk for participants.

Abbreviations

CFI Comparative fit Index

PR Prevalence Ratio

RMSEA Root mean square error of approximation

SEM Structural equation models

SRMR Standardized root mean square residual

WPA World Psychiatric Association

Declarations

Ethics approval and consent to participate:

The survey was anonymous, and no information in the database could be used to identify the participants. Hence, conducting this analysis did not represent an ethical risk for participants since there was no access to confidential data. The study did not require the approval of an ethics committee because it came from a secondary database that is open access. Therefore, no primary data collection was performed and the study did not involve an ethical risk for participants.

Consent for publication:

Not applicable.

Availability of data and materials:

The ENSUSALUD database is publicly available on the web (<http://portal.susalud.gob.pe/blog/base-de-datos-2016>).

Competing interests:

Luciana Bellido-Boza and Edward Mezones-Holguin worked in the Superintendencia Nacional de Salud (SUSALUD) when the survey was developed and coordinated the design on behalf of ENSUSALUD.

Funding:

SUSALUD funded the ENSUSALUD; however, this analysis was not funded.

Authors' contributions:

David Villarreal-Zegarra: Conceptualization, Formal Analysis, Methodology, Visualization, Writing – Original Draft Preparation, Accepts the final version, and Accepts responsibility for the contents of this study.

Wilder Iván Lázaro-Illatopa: Formal Analysis, Writing – Original Draft Preparation, Accepts the final version, and Accepts responsibility for all contents of the article.

Ronald Castillo-Blanco: Supervision, Formal Analysis, Methodology, Writing – Review & Editing, Accepts the final version, and Accepts responsibility for all contents of the article.

Baltica Cabieses: Supervision, Validation, Writing – Review & Editing, Accepts the final version, and Accepts responsibility for all article contents.

Alice Blukacz: Supervision, Validation, Writing – Review & Editing, Accepts the final version, and Accepts responsibility for all contents of the article.

Luciana Bellido-Boza: Supervision, Validation, Writing – Review & Editing, Accepts the final version, and Accepts responsibility for all article contents.

Edward Mezones-Holguin: Conceptualization, Supervision, Validation, Writing – Review & Editing, Accepts the final version, and Accepts responsibility for all contents of the article.

Acknowledgements:

None.

Authors' information:

Not applicable.

References

1. Harvey, S. B.*et al.* Can work make you mentally ill? A systematic meta-review of work-related risk factors for common mental health problems. *Occupational and environmental medicine* **74**, 301-310, doi:10.1136/oemed-2016-104015 (2017).
2. Brand, S. L.*et al.* Whole-system approaches to improving the health and wellbeing of healthcare workers: A systematic review. *PLOS ONE* **12**, e0188418, doi:10.1371/journal.pone.0188418 (2017).
3. Ruitenburg, M. M., Frings-Dresen, M. H. W. & Sluiter, J. K. The prevalence of common mental disorders among hospital physicians and their association with self-reported work ability: a cross-sectional study. *BMC health services research* **12**, 292, doi:10.1186/1472-6963-12-292 (2012).
4. Hem, E., Grønvold, N. T., Aasland, O. G. & Ekeberg, Ø. The prevalence of suicidal ideation and suicidal attempts among Norwegian physicians. Results from a cross-sectional survey of a nationwide sample. *European Psychiatry* **15**, 183-189, doi:[https://doi.org/10.1016/S0924-9338\(00\)00227-3](https://doi.org/10.1016/S0924-9338(00)00227-3) (2000).
5. Gold, K. J., Sen, A. & Schwenk, T. L. Details on suicide among US physicians: data from the National Violent Death Reporting System. *General hospital psychiatry* **35**, 45-49, doi:10.1016/j.genhosppsych.2012.08.005 (2013).
6. Plata Guarneros, M., Flores Cabrera, L., Curiel Hernández, O., Juárez Ocaña, J. & Rosas Barrientos, J. Depresión y ansiedad en la residencia médica. *Revista de Especialidades Médico-Quirúrgicas* **16**, 157-162 (2011).
7. Kansoun, Z.*et al.* Burnout in French physicians: A systematic review and meta-analysis. *Journal of affective disorders* **246**, 132-147, doi:<https://doi.org/10.1016/j.jad.2018.12.056> (2019).
8. Hernández-Vargas, C., Eloisa Dickinson, M. & Fernández Ortega, M. El síndrome de desgaste profesional Burnout en médicos mexicanos. *Rev Fac Med UNAM* **51**, 11-14 (2008).
9. Galán-Rodas, E.*et al.* Salud mental en médicos que realizan el servicio rural, urbano-marginal en salud en el Perú: Un estudio de línea base. *Revista peruana de medicina experimental y salud publica* **28**, 277-281 (2011).
10. Maticorena-Quevedo, J., Beas, R., Anduaga-Beramendi, A. & Mayta-Tristán, P. Prevalencia del síndrome de burnout en médicos y enfermeras del Perú, Ensusalud 2014. *2016*, 7, doi:10.17843/rpmesp.2016.332.2170 (2016).
11. Arias Gallegos, W. L., Muñoz del Carpio Toia, A., Delgado Montesinos, Y., Ortiz Puma, M. & Quispe Villanueva, M. Síndrome de burnout en personal de salud de la ciudad de Arequipa (Perú). *Medicina y Seguridad del Trabajo* **63**, 331-344 (2017).
12. Vásquez-Manrique, J., Maruy, A. & Verne, E. Frecuencia del síndrome de Burnout y niveles de sus dimensiones en el personal de salud del servicio de emergencia de pediatría del Hospital Nacional Cayetano Heredia en el año 2014. Lima, Perú. *Revista de Neuro-Psiquiatría* **77**, 168-174, doi:10.20453/rnp.2014.2031 (2014).
13. Maslach, C. & Leiter, M. P. Understanding the burnout experience: recent research and its implications for psychiatry. *World psychiatry : official journal of the World Psychiatric Association (WPA)* **15**, 103-111, doi:10.1002/wps.20311 (2016).

14. Rotenstein, L. S. *et al.* Prevalence of Burnout Among Physicians: A Systematic Review. *Jama* **320**, 1131-1150, doi:10.1001/jama.2018.12777 (2018).
15. Koutsimani, P., Montgomery, A. & Georganta, K. The Relationship Between Burnout, Depression, and Anxiety: A Systematic Review and Meta-Analysis. *Frontiers in psychology* **10**, doi:10.3389/fpsyg.2019.00284 (2019).
16. Marcelino Filho, A. & Araújo, T. M. d. ESTRESSE OCUPACIONAL E SAÚDE MENTAL DOS PROFISSIONAIS DO CENTRO DE ESPECIALIDADES MÉDICAS DE ARACAJU. *Trabalho, Educação e Saúde* **13**, 177-199 (2015).
17. Wang, J.-N., Sun, W., Chi, T.-S., Wu, H. & Wang, L. Prevalence and associated factors of depressive symptoms among Chinese doctors: a cross-sectional survey. *International Archives of Occupational and Environmental Health* **83**, 905-911, doi:10.1007/s00420-010-0508-4 (2010).
18. Palmer, Y., Gómez-Vera, A., Cabrera-Pivaral, C., Prince-Vélez, R. & Searcy, R. Factores de riesgo organizacionales asociados al síndrome de Burnout en médicos anestesiólogos. *Salud mental* **28**, 82-91 (2005).
19. Tyssen, R., Palmer, K. S., Solberg, I. B., Voltmer, E. & Frank, E. Physicians' perceptions of quality of care, professional autonomy, and job satisfaction in Canada, Norway, and the United States. *BMC Health Serv Res* **13**, 516, doi:10.1186/1472-6963-13-516 (2013).
20. Ping Lim, A. J., Khun Loo, J. T. & Huey Leec, P. THE IMPACT OF LEADERSHIP ON TURNOVER INTENTION: THE MEDIATING ROLE OF ORGANIZATIONAL COMMITMENT AND JOB SATISFACTION. *The impact of leadership on turnover intention: the mediating role of organizational commitment and job satisfaction* **1**, 24-41 (2017).
21. Faragher, E. B., Cass, M. & Cooper, C. L. The relationship between job satisfaction and health: a meta-analysis. *Occupational and environmental medicine* **62**, 105-112, doi:10.1136/oem.2002.006734 (2005).
22. Oliveira, A. M. d., Silva, M. T., Galvão, T. F. & Lopes, L. C. The relationship between job satisfaction, burnout syndrome and depressive symptoms: An analysis of professionals in a teaching hospital in Brazil. *Medicine* **97**, e13364, doi:10.1097/md.0000000000013364 (2018).
23. Sauerteig, S. O., Wijesuriya, J., Tuck, M. & Barham-Brown, H. Doctors' health and wellbeing: at the heart of the NHS's mission or still a secondary consideration? *International review of psychiatry (Abingdon, England)* **31**, 548-554, doi:10.1080/09540261.2019.1586165 (2019).
24. Kravitz, R. L. Physician job satisfaction as a public health issue. *Israel Journal of Health Policy Research* **1**, 51, doi:10.1186/2045-4015-1-51 (2012).
25. Bonde, J. P. Psychosocial factors at work and risk of depression: a systematic review of the epidemiological evidence. *Occupational and environmental medicine* **65**, 438-445, doi:10.1136/oem.2007.038430 (2008).
26. Nieuwenhuijsen, K., Bruinvels, D. & Frings-Dresen, M. Psychosocial work environment and stress-related disorders, a systematic review. *Occupational medicine (Oxford, England)* **60**, 277-286, doi:10.1093/occmed/kqq081 (2010).

27. Ribeiro, R. B., Assunção, A. A. & de Araújo, T. M. Factors associated with job satisfaction among public-sector physicians in Belo Horizonte, Brazil. *International journal of health services : planning, administration, evaluation* **44**, 787-804, doi:10.2190/HS.44.4.f (2014).
28. Assunção, A. A., Machado, C. J., Prais, H. A. & de Araújo, T. M. Depression among physicians working in public healthcare in Belo Horizonte, Brazil. *Social psychiatry and psychiatric epidemiology* **49**, 1219-1229, doi:10.1007/s00127-014-0850-z (2014).
29. Paiva, C. E., Martins, B. P. & Paiva, B. S. R. Doctor, are you healthy? A cross-sectional investigation of oncologist burnout, depression, and anxiety and an investigation of their associated factors. *BMC cancer* **18**, 1044, doi:10.1186/s12885-018-4964-7 (2018).
30. Lazo, O., Alcalde-Rabanal, J. & Espinosa-Henao, O. *El sistema de salud en Peru: situación y desafíos*. (2016).
31. Cetrangolo, O., Bertranou, F., Casanova, L. & Casalí, P. *El sistema de salud del Perú: situación actual y estrategias para orientar la extensión de la cobertura contributiva*. (2013).
32. Mezones-Holguín, E. *et al.* [Health insurance coverage: the peruvian case since the universal insurance act]. *Rev Peru Med Exp Salud Publica* **36**, 196-206, doi:10.17843/rpmesp.2019.362.3998 (2019).
33. Sánchez-Moreno, F. [The national health system in Peru]. *Rev Peru Med Exp Salud Publica* **31**, 747-753 (2014).
34. Jimenez, M. M., Bui, A. L., Mantilla, E. & Miranda, J. J. Human resources for health in Peru: recent trends (2007-2013) in the labour market for physicians, nurses and midwives. *Hum Resour Health* **15**, 69-69, doi:10.1186/s12960-017-0243-y (2017).
35. Calderón-de la Cruz, G. A., Merino-Soto, C., Juárez-García, A., Dominguez-Lara, S. & Fernández-Arata, M. ¿Es replicable la estructura factorial del Maslach Burnout Inventory Human Service Survey (MBI-HSS) en la profesión de enfermera del Perú?: un estudio nacional. *Enfermería Clínica* **30**, 340-348, doi:<https://doi.org/10.1016/j.enfcli.2019.12.013> (2020).
36. Turner, N., Stride, C. B., Carter, A. J., McCaughey, D. & Carroll, A. E. Job Demands–Control–Support model and employee safety performance. *Accident Analysis & Prevention* **45**, 811-817, doi:<https://doi.org/10.1016/j.aap.2011.07.005> (2012).
37. Rothenberger, D. A. Physician Burnout and Well-Being: A Systematic Review and Framework for Action. *Diseases of the Colon and Rectum* **60**, 567-576, doi:10.1097/DCR.0000000000000844 (2017).
38. Díaz-Carrión, R., Navajas-Romero, V. & Casas-Rosal, J. C. Comparing working conditions and job satisfaction in hospitality workers across Europe. *International journal of hospitality management* **90**, 102631, doi:10.1016/j.ijhm.2020.102631 (2020).
39. Naveen, R. Mental Health in the Workplace: World Mental Health Day 2017. *Indian J Occup Environ Med* **21**, 99-100, doi:10.4103/ijoem.IJOEM_148_17 (2017).
40. Vigo, D., Thornicroft, G. & Atun, R. Estimating the true global burden of mental illness. *The lancet. Psychiatry* **3**, 171-178, doi:10.1016/s2215-0366(15)00505-2 (2016).

41. Amiri, S., Behnezhad, S. & Azad, E. Back pain and depressive symptoms: A systematic review and meta-analysis. *International journal of psychiatry in medicine*, 91217420913001, doi:10.1177/0091217420913001 (2020).
42. Villarreal-Zegarra, D., Cabrera-Alva, M., Carrillo-Larco, R. M. & Bernabe-Ortiz, A. Trends in the prevalence and treatment of depressive symptoms in Peru: a population-based study. *BMJ Open* **10**, e036777, doi:10.1136/bmjopen-2020-036777 (2020).
43. Villarreal-Zegarra, D. & Bernabe-Ortiz, A. Association between arterial hypertension and depressive symptoms: Results from population-based surveys in Peru. *Asia-Pacific Psychiatry* **12**, e12385, doi:10.1111/appy.12385 (2020).
44. Gu, L.-X., Chu, J., Qi, Z.-B. & Jia, C.-X. Depressive symptoms and correlates among village doctors in China. *Asian Journal of Psychiatry* **28**, 188-192, doi:<https://doi.org/10.1016/j.ajp.2017.07.004> (2017).
45. Reyes-Torres, M., Ríos-Santos, J. V., López-Jiménez, A., Herrero-Climent, M. & Bullón, P. Job satisfaction and depression in the Spanish Society of Periodontology and Research (SEPA) members, and their relation to the burnout syndrome. Creation of a structural model. *Medicina oral, patología oral y cirugía bucal* **17**, e821-824, doi:10.4317/medoral.17478 (2012).
46. Kroenke, K., Spitzer, R. L. & Williams, J. B. W. The Patient Health Questionnaire-2: Validity of a Two-Item Depression Screener. *Medical Care* **41**, 1284-1292, doi:10.1097/01.mlr.0000093487.78664.3c (2003).
47. Gray, P.*et al.* Workplace-based organizational interventions promoting mental health and happiness among healthcare workers: A realist review. *International Journal of Environmental Research and Public Health* **16**, doi:10.3390/ijerph16224396 (2019).
48. Villarreal-Zegarra, D.*et al.* *Development a Set of Scales to Assess Job Satisfaction Among Physicians in Peru: Validity and Reliability Assessment.* (2020).
49. Maslach, C., Jackson, S. & Leiter, M. Vol. 3 191-218 (1997).
50. Ferguson, C. J. An effect size primer: A guide for clinicians and researchers. *Professional Psychology: Research and Practice* **40**, 532-538, doi:10.1037/a0015808 (2009).
51. Hair, J., Anderson, R., Tatham, R. & Black, W. *Análisis multivariante.* 5ª edn, (Prentice Hall, 1999).
52. Li, C.-H. Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. *Behavior Research Methods* **48**, 936-949, doi:10.3758/s13428-015-0619-7 (2016).
53. Dominguez Lara, S. ¿Matrices Policóricas/Tetracóricas o Matrices Pearson? Un estudio metodológico. *Revista Argentina de Ciencias del Comportamiento* **6**, 39-48 (2014).
54. Mufarrih, S. H.*et al.* Burnout, Job Dissatisfaction, and Mental Health Outcomes Among Medical Students and Health Care Professionals at a Tertiary Care Hospital in Pakistan: Protocol for a Multi-Center Cross-Sectional Study. *Frontiers in psychology* **10**, 2552, doi:10.3389/fpsyg.2019.02552 (2019).

55. Lazarescu, I. *et al.* Prevalence of burnout, depression and job satisfaction among French senior and resident radiation oncologists. *Cancer radiotherapie : journal de la Societe francaise de radiotherapie oncologique* **22**, 784-789, doi:10.1016/j.canrad.2018.02.005 (2018).
56. Hu, L.-t. & Bentler, P. M. Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods* **3**, 424-453, doi:10.1037/1082-989X.3.4.424 (1998).
57. Epskamp, S. semPlot: Unified Visualizations of Structural Equation Models. *Structural Equation Modeling: A Multidisciplinary Journal* **22**, 1-10, doi:10.1080/10705511.2014.937847 (2015).

Table

Due to technical limitations, table 2 is only available as a download in the Supplemental Files section.

Figures

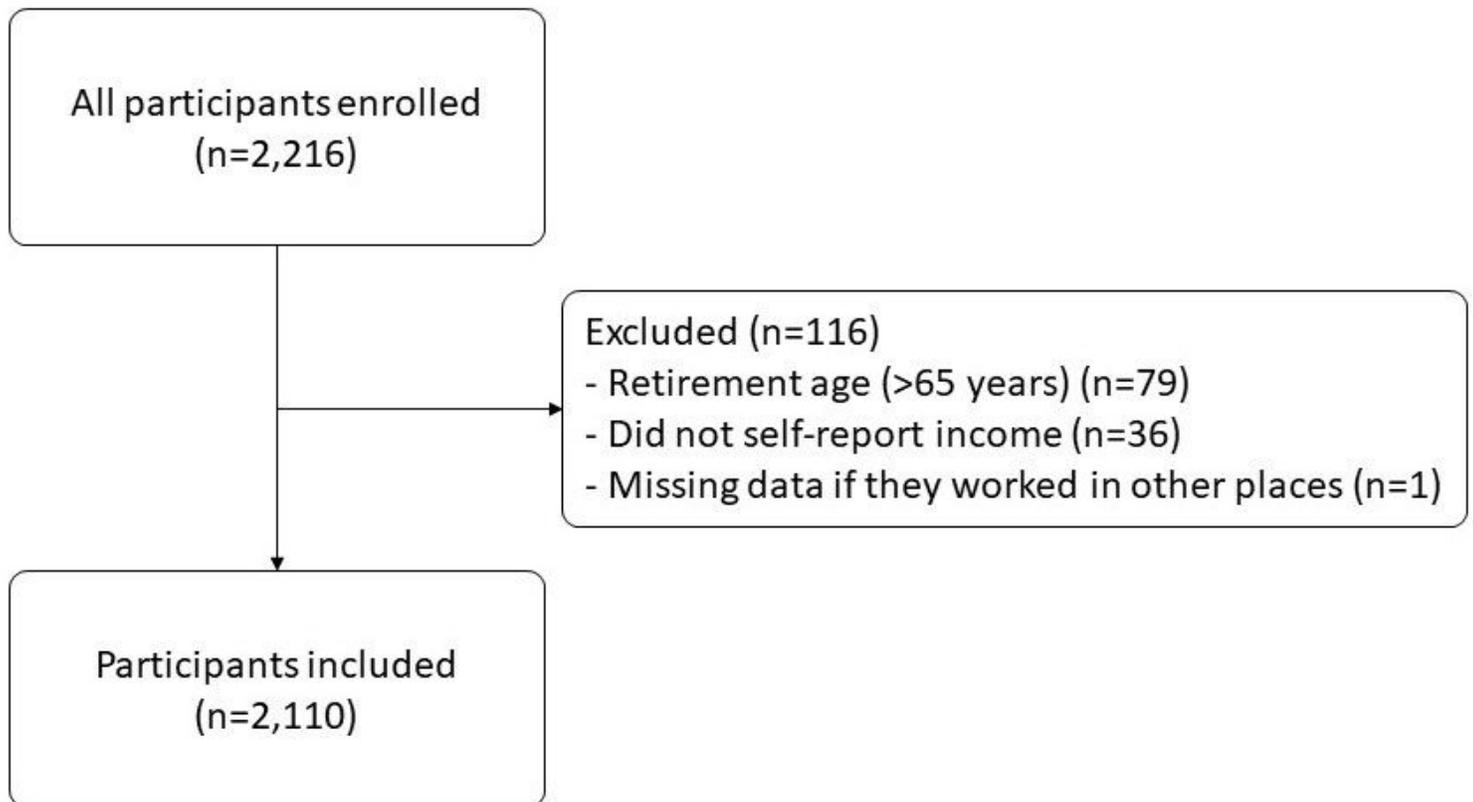
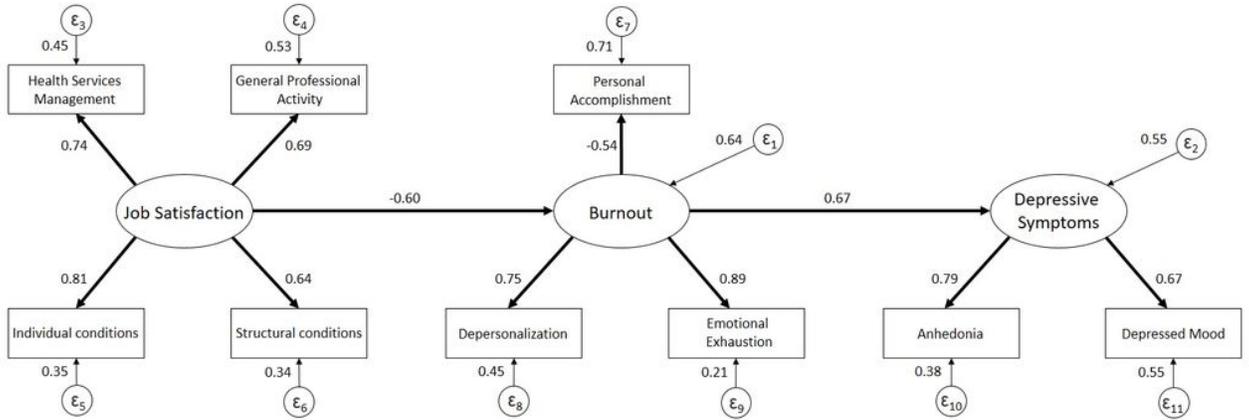


Figure 1

Flowchart of the participants included in the study.

Model 1



Model 2

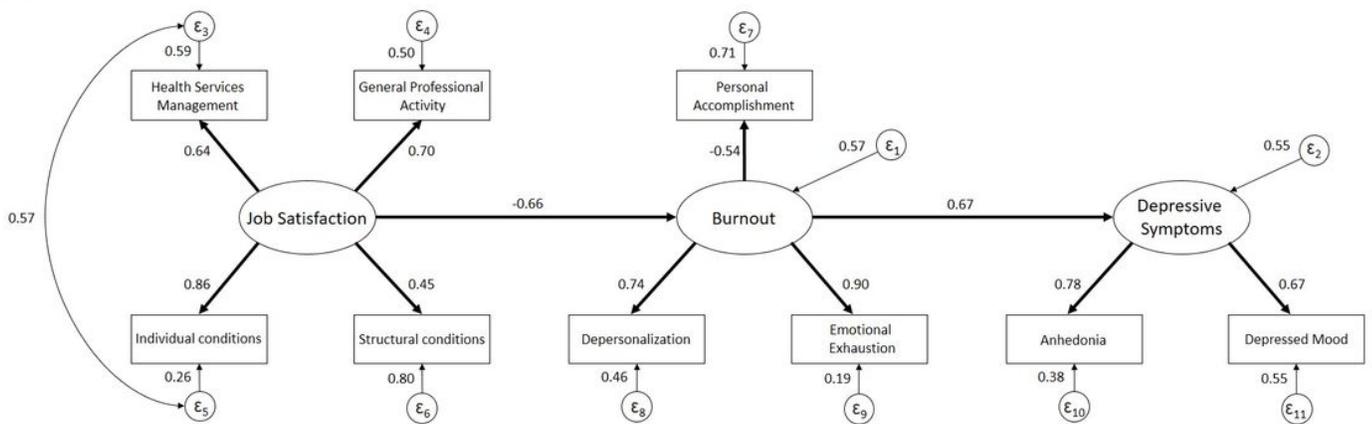


Figure 2

Model of structural regressions for job satisfaction, burnout, and depressive symptoms in Peruvian physicians. Note: The model values considered the weighting factor of the complex sample.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Table2.docx](#)