Research Article

Predictors of psychopathologic symptoms by work-related stress factors in Mental Health Professionals of a tertiary-level Psychiatric Hospital in Mexico City

María Eugenia Hernández Gutiérrez[1]*, Patricia Ortega-Andeane[2]*, Danelia Mendieta[3], Karla Vanessa García-Mejorado[3], Elvia Coballase-Urrutia[4], María Isabel Barrera-Villalpando[5], Anabel Flores Zamora[6] and Maricela Irepan-Aguilar[7]

[1]Researcher in Medical Sciences, Subdirectorate of Clinical Research, National Institute of Psychiatry "Ramón de la Fuente" Subdirectorate of Clinical Research, Ramón de la Fuente Muñiz National Institute of Psychiatry, Mexico

[2]Professor, Division of Research and Graduate Studies, School of Psychology at the National Autonomous University of Mexico, México

[3]Clinical Service, National Institute of Psychiatry "Ramón de la Fuente", México

[4]Laboratory of Neuroscience, National Institute of Pediatrics, México

[5]Departament of Rehabilitation, National Institute of Psychiatry "Ramón de la Fuente", México

[6]Subdirection of Clinical Research, National Institute of Psychiatry "Ramón de la Fuente", México

[7]Division of Research and Graduate Studies, School of Psychology at the National Autonomous University of Mexico, México

https://www.peertechzpublications.org

Check for updates

Abstract

Introduction: Mexico has a high prevalence of work stress; mental health professionals are a vulnerable group who experience demanding environments that place their own mental health at risk.

Objective: The present study aimed to evaluate the work-related stress levels and development of psychopathology in mental health professionals of a tertiary-level psychiatric hospital in Mexico City.

Methods: The study included 90 mental health professionals, utilizing two questionnaires: (1) to analyze the level of occupational stress, the Stress Work Instrument (SWI) for Mexican physicians was employed; and (2) for symptomatic distress, the Symptom Checklist-90-Revised (SCL-90-R) was applied. Two theoretical assumptions' ('Effort-Reward' for Karasek and "Effort-Reward Imbalance" for Siegrist) were used to propose an analytical model based on structural equations.

Results: The model obtained showed a high and positive structural coefficient (0.76). The goodness-of-fit for the model was acceptable (χ^2 = 51.22, p = .02; CFI = .97; RMSEA = 0.08). This study showed a causal explanation for the generation of distress, and the model detected a strong and significant effect from work stress to distress.

Conclusion: We conclude that the model obtained predicts a significant effect of work-related stress on mental health such as anxiety, depression, somatization, and feelings of inadequacy in mental health professionals. Therefore, work-related stress factors should be minimized thus preventing distress to ensure that psychiatric personnel enjoy physical and mental health enabling them for efficient and professional clinical practice.

Abbreviations

SCL-90-R: Symptom Checklist-90-Revised; SWI: Stress Work Instrument; MLE: Maximum Likelihood Estimation; SEM: Structural Equation Analysis; ML: Maximum Likelihood; CFI: Comparative Fit Index; RMSEA: Root Mean Square Error of Approximation

Introduction

Work-related stress is a global issue, recognized worldwide as a major problem facing healthcare professionals [1,2]. Stress is an integral part of an employee's life, occurring due to a wide variety of job circumstances [3]. However, stress can be short-term and positive (eustress), or long-term and negative stress (distress) [4]. Both can lead to a variety of symptoms; however, long-term excessive stress can lead to psychological problems such as depression and anxiety [5]. Research has consistently documented elevated rates of psychological stress in health professionals, particularly in emergency, intensive care, and psychiatry units [6-8]. Psychological stress is defined as a particular relationship between the individual and their environment, that they themself evaluate as threatening or overwhelming with respect to their resources and jeopardizing their well-being [9]. Work stress has been identified as a group of emotional, psychological, cognitive, and behavioral reactions to professional demands that exceed workers' knowledge and abilities to perform optimally [5]. Mexico has a high prevalence of work stress, ranking first in the world [10]. In the medical field, mental health professionals are no exception. Those working in physically (heavy workload, long hours, job insecurity) and socially exhausting environments (from patients with mood disorders to violent, self-injurious, and suicidal patients) are at a high risk of developing psychopathology (anxiety and depression) [11]. Various studies have reported that mental health professionals (psychiatric physicians, psychiatric trainees, and nursing personnel) exhibit burnout, job dissatisfaction, musculoskeletal disorders, absenteeism, and reduced efficiency and performance in their organizations [12-15]. In this respect, organizational culture has been known to be an important characteristic that influences the behaviors of groups and individuals within an organization, as in the case of public health hospitals. These institutions are obliged to provide timely, acceptable, affordable, and satisfactory quality medical care. However, the effectiveness of the response depends on the organization of health services, mainly human and financial resources. In this sense, Siegrist (1996) establishes in his effort-reward imbalance theory that a high-level effort in work and low rewards can lead to stress levels that affect the physical and mental health of workers [16,17]. Various risk factors, such as low salary, work overload, inadequate working conditions, continuing educational training, etc., have been addressed as distress triggers. Moreover, theoretical assumptions by Karasek´s (1979) job demands-control establishes the key idea

that control buffers the impact of job demands on the strain and can help enhance employees 'job satisfaction'. In this regard, lack of motivation and professional demerit are aspects related to low control and job dissatisfaction. This set of factors can induce emotional exhaustion that will impact the physical and mental health of workers.

Psychiatric trainees are exposed to excessive academic workloads, competition with peers, fear of failing, etc., and conflicts with work-life balance and hospital ward rotations [18]. In addition, their subordinate status restricts their autonomy to different scales of decision-making [19]. In Mexico, a study of physicians' trainees in a tertiary-level mental hospital in Mexico City identified emotional burnout, excessive work demands, decreased motivation to perform tasks, demerited professional perceptions, and dissatisfaction with conditions provided by institutions [20]. Regarding the risk of psychopathology, trainees exhibited depression and anxiety symptoms, suicidal ideation, and substance use [21]. Moreover, psychiatric nursing is one of the three most stressful professions. Among the stressful events that psychiatric nurses experience are aggressive patients, verbal and physical violence, recurrent relapses by poor adherence to treatment, etc. [21,22]. Studies have demonstrated high levels of stress in psychiatric nurses, presenting with depressive and anxiety symptoms in several countries, including Mexico [22,23].

Moreover, psychiatrists have stressful work with intense emotions and feelings (fear, frustration, sense of failure, etc.) in their clinical practice [13]. This group of professionals represents a high-risk group due to experiencing burnout, suicide risk, and alcohol and drug use, in addition to fulfilling administrative duties, and may be unaccustomed to working in a constantly changing work environment, with high workload and work pace (working under time pressures), with strict or inflexible schedules, etc., predisposes psychiatrists to high levels of occupational stress [24]. In such a way, work-related stress is a result of the mismatch between an individual and the environment, because of the harmful and emotional responses that occur when the requirements of the job do not match the capabilities, resources, or needs of the worker [5]. Generally, a higher discrepancy between external stresses and an individual's capabilities causes a higher level of stress experienced [25]. The suggested theoretical frameworks will support the concept that work-related stress is linked to negative mental health. The theoretical assumptions' of Karasek's "demand-control", or job strain, have been very important in research on the psychosocial work environment [26], stress, and illness since the early 1980s, describing and analyzing work situations in which stressors are chronic, and emphasizing the psychosocial characteristics of the work environment [26]. The health variables have the greatest association and scientific evidence to mental health disorders [27]. This evidence confirms mental impairment in the face of synergy with high demands and under control at work [28,29].

On the other hand, Siegrist related and complemented it with the theoretical assumption of "Effort-Reward Imbalance" (ERI), where he mentions that the interaction between a high effort and a low level of reward in the long term represents the situation posing the greatest risk to health [30]. Based on the theoretical antecedents mentioned by the

Karasek's "Demand-control" and Siegrist's "Effort-Reward Imbalance", the aim of this study was to evaluate the effects of work-related stress levels on the development of psychopathology in mental health professionals at a tertiary-level psychiatric hospital in Mexico City, and two hypotheses were proposed for testing:

H1: Work-related stress has a positive effect on the development of distress.

H2: Work-related stress has a negative effect on the development of distress.

Materials and methods

Study location

The study was conducted with mental health workers at a tertiary-level mental hospital in Mexico City. A cross-sectional survey recruited participants from September 2014 to March 2015.

Sample and procedures

An observational, cross-sectional, prospective, and descriptive study was carried out, employing a questionnaire addressed to healthcare personnel (psychiatric physicians, psychiatric residents, and nursing personnel). The questionnaires contained an informed consent form, specifying that the survey was anonymous, and confidentiality of information was assured. Two validated questionnaires were used: (1) the Stress Work Instrument (SWI) for Mexican physicians [31], to analyze the level of occupational stress; and (2) the Symptom Checklist-90-Revised (SCL90-R) [32], to assess symptomatic distress.

The Stress Work Instrument is an instrument consisting of 38 items with a Likert answer scale with four options: 0 (never) to 3 (frequently), where 0 indicates an innocuous situation, and 3 indicates a highly stressful situation, covering six valid factors: (1) emotional exhaustion; (2) dissatisfaction with salary; 3) dissatisfaction with professional practice; (4) lack of motivation; (5) work overload; and (6) professional demerit. It has an alpha value of 0.94 and explained variance of 56%. The Symptom Checklist-90-Revised (SCL-90-R) consists of 90 question items in nine subcategories: somatization, obsessive-compulsive behavior, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. The test respondents were instructed to select the corresponding scores depending on the prevalence of symptoms over the last seven days, including the day of the test, using a Likert scale of 0 (never) to 5 (very often). The mean reliability of each factor was estimated to have a Cronbach's alpha value of 0.81.

Clinical measures of sociodemographic information, such as age, sex, education level, marital status, religion, and profession level were collected. The sample included 28 psychiatric physicians, 33 psychiatric trainees, and 29 nurses. The participants received sufficient explanation about the study, and those who agreed to it were included in the analysis. The procedure consisted of giving the questionnaire package to the participants, who answered and returned it that same day to be registered in the database for analysis.

Inclusion and exclusion criteria

Psychiatric physicians, psychiatric trainees, and nurses (male and female) working at tertiary-level mental hospitals in Mexico City, Mexico, were included in the study (INPRF-CEI C/059), which was approved by an institutional review board and a qualified ethics review committee. All participants accepted and signed the informed consent form. Psychiatric trainees in rotation and health professionals who incompletely answered questionnaires or withdrew their informed consent were excluded.

Statistical analysis

For descriptive analysis, Pearson's correlation was performed using SPSS 22.0 (SPSS Inc, Chicago, IL, USA). Descriptive analysis was generated from the demographic characteristics to describe the participant's age, education, and religious beliefs. Pearson's correlations were conducted to examine the correlations between SCL-90-R factors (somatization, interpersonal sensitivity, depression, and anxiety) and Stress Work Instrument factors (emotional exhaustion, dissatisfaction with salary, dissatisfaction with professional practice, lack of motivation, work overload, and professional demerit). The significance level was $p < 0.05$. A structural equation model was specified using EQS 6 [33], with maximum likelihood estimation (MLE).

Results

Recruitment and characteristics of the sample

A total of 100 participants were initially selected, of which, 10 were subsequently excluded because they did not complete the questionnaire package. As a result, a total of 90 mental health professionals were enrolled, grouped as follows: psychiatric physicians (n = 28), psychiatric trainees (n = 33), and nursing personnel (n = 29).

Demographic data

The demographic characteristics of the groups are presented in Table 1. In this study, 90 mental health professionals (female n = 52, male n = 38) participated at the request of researchers through informed consent. As presented in Table 1, the data indicated that the average age was 36 years, and psychiatric residents were the youngest at 28 years. In the case of education, the average was 21 years, with nursing personnel exhibiting the fewest years of education at 17 years. In terms of religious beliefs, 71% and 29% were with and without religion, respectively; of those holding religious beliefs, 42% were nursing personnel.

Pearson's correlation between Symptom Checklist-90-Revised (SCL-90-R) and Stress Work Instrument (SWI) factors

The data in Table 2 presents the correlations between the four factors of SCL90R and six factors of SWI, showing that all significant associations ($p \leq 0.05$) were positive. The relationships between the factors from SCL-90-R and SWI were moderate (ranging from 0.395 to 0.673), whereas as expected, the relationships were moderately high among the factors of SWI (ranging from 0.665 to 0.874) because they were part of the same instrument, as well as among the factors of SCL-90-R (ranging from 0.624 to 0.709). The moderate correlations between the factors of the two instruments are shown, in order to demonstrate that are moderate and therefore measure different constructs, i.e., one measures work stress and the other, aspects of psychopathology. As well as to avoid any multicollinearity issues, and also in order to meet the requirements for the development of the structural equation model.

Structural model with Maximum Likelihood Estimation (MLE)

To test the hypotheses, Structural Equation Analysis (SEM) was used to determine the direct and indirect effects of several latent and observed variables measured at the same time. A latent variable is one that uses other observed variables to measure the attribute. The SEM is used to estimate the association between the variables. Among the advantages of using this methodology are the simultaneous testing of direct, indirect, and total relationships between variables, the inclusion of measurement errors, and the correlation between variables and their measurement errors.

Based on structural modeling, we used the method of Maximum Likelihood (ML) to estimate the parameters. The model tested consists of two latent variables: the first one, called Work Stress, and was made up of one of six observed variables, each one with high positive factor loadings, i.e., emotional exhaustion (0.95), dissatisfaction with salary (0.82), dissatisfaction with professional practice (0.91), lack of motivation (0.81), work overload (0.87), and professional demerit (0.81); the second latent variable called Distress and was made up of four observed variables, each one with high positive factor loading, i.e., somatization (0.78), interpersonal sensitivity (0.84), depression (0.83), and anxiety (0.81).

To estimate the effect size of the influence of Work Stress on Distress, structural modeling was used with the maximum likelihood method (ML) to estimate the parameters. The model obtained showed a high and positive structural coefficient (0.76). Considering as optimal indices, comparative fit index (CFI) close to 1 and root mean square of approximation (RMSEA) less than 0.05, the goodness of fit for the model was good (χ^2 = 51.22, p = 0.02; CFI = 0.97; RMSEA = 0.08) as seen in Figure 1, which indicates a plausible and congruent model that represents the potential relationship of two theoretical and proved constructors based on this solid and significant structure.

Thus, we test and accept hypothesis 1, that is, there is a positive and direct influence between work stress and distress experienced by mental health professionals of a tertiary-level psychiatric hospital. Although the χ^2 index yielded significant results, indicating differences between the saturated and the restricted model, this test is known to be sensitive to sample size; therefore, the literature suggests using the resulting χ^2 coefficient between its degrees of freedom, which must be at least three to indicate a good fit [34] which, in this case, was 51.22/32 = 1.70.

Table 1: Demographic characteristics of the groups.

Variable	Total (*n* = 90)	Psychiatric trainees (*n* = 33)	Psychiatric physicians (*n* = 28)	Nursing personnel (*n* = 29)
Age (years)	36 ± 8	28 ± 2	40 ± 7	41 ± 7
Sex (female/male)	52/38	18/15	11/17	23/6
Education (years)	21 ± 4	21 ± 2	25 ± 3	17 ± 4
Religious Beliefs (yes/no)	64/26	23/10	14/14	27/2

Table 2: Product-moment correlation coefficients between the scores of the factors from SCL90-R and SWI.

	1	2	3	4	5	6	7	8	9	10
Emotional exhaustion	1									
Dissatisfaction with salary	.771**	1								
Dissatisfaction with professional practice	.874**	.719**	1							
Lack of motivation	.752**	.769**	.734**	1						
Work overload	.836**	.722**	.815**	.676**	1					
Professional demerit	.764**	.700**	.746**	.665**	.665**	1				
Somatization	.571**	.395**	.501**	.422**	.480**	.483**	1			
Interpersonal sensitivity	.637**	.425**	.537**	.544**	.545**	.496**	.624**	1		
Depression	.673**	.439**	.594**	.454**	.596**	.479**	.672**	.705**	1	
Anxiety	.571**	.471**	.574**	.53**	.516**	.515**	.656**	.709**	.624**	1

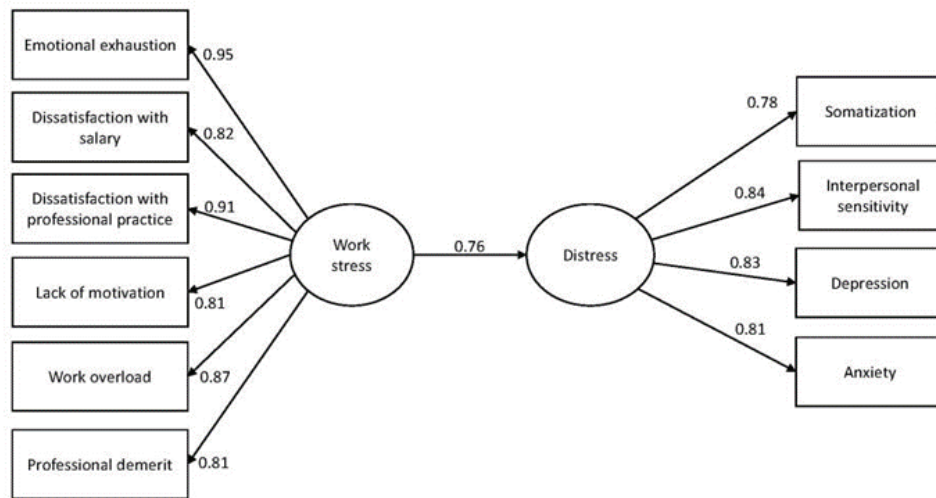**The correlation is significant at the 0.01 level.

Figure 1: Model of the influence of work stress on distress.

Discussion

The prevention of physical and mental illness in workers should be a global priority [5]. The purpose of this study was to ascertain the effect of developing psychopathology among mental health professionals on their work-related stress levels. For building the model concerning latent variable work stress, emotional exhaustion, as the observed variable, had the highest load (0.95). Various studies have shown that mental health professionals have poorer well-being than those in other health care units [2,35]. Studies, particularly in Mexican cities, have shown that health professionals present average emotional exhaustion symptom values (burnout) [36]. Mental health services in Mexico are limited, and it has been estimated that there are 0.67 psychiatric per 100,000 inhabitants. Additionally, psychiatric care is concentrated in only three cities, one of which is Mexico City, and approximately 50% of patients with mental illness are treated in tertiary-level hospitals, which increases the workload [37]; not surprisingly, we observed high levels of work overload (0.87), in addition to emotional exhaustion.

Work takes up a significant percentage of one's life; if the workload increases, workers expect fair payment. When these expectations are not met, it brings feelings of disappointment, bitterness, and lack of interest, leading to work dissatisfaction [38]. Healthcare specialists in Mexico have an average salary of USD 1050, compared to USD 3400 dollars in the United States, which explains the salary and work dissatisfaction [39]. One cause of work dissatisfaction is the lack of motivation; in our model, we noted high loads of the observed variable (0.81). Motivation can be defined as a psychological process that gives behavior purpose and direction, which will impact the interactions between individuals and their work environment [40]. However, motivational processes can be affected by determinants of motivation (such as salary, incentives, values, expectations, and poor work environment) affecting performance and work satisfaction, for example, in mental health professionals [41]. Studies of health workers in Mexico showed low motivation, job dissatisfaction, and professional dissatisfaction rates of approximately 30% in a sample of five thousand workers [42]. In our study, we also found significant levels of dissatisfaction with professional practices (0.91). This factor is a negative response or rejection and will depend, to a great extent, on the working conditions and personality of each person [43]. Regarding working conditions, mental health professionals are exposed to stressors from outside the doctor-patient dynamic (increasingly litigious, increasing bureaucratic requirements, continuous academic updating, limited recourses, constantly changing work environment, etc.), which induce high levels of stress and thereby practicing professionals can develop emotional exhaustion and dissatisfaction [7].

Concerning personality, it has been observed that a five-factor model of personality (constituting traits of extraversion, neuroticism, openness to experience, agreeableness, and conscientiousness) is useful because its dimensions are related to different work or vocational dimensions [44]. Additionally, job strain was positively predicted by neuroticism, and negatively by openness to experience and conscientiousness [45]. Individuals with neuroticism respond poorly to environmental stress because they perceive their environment as distressing, threatening, and unsafe [46]. In this regard, studies on psychiatrists and psychiatric trainees on personality revealed significantly higher scores on neuroticism and lower scores on frustration tolerance [47]. In addition, when comparing psychiatrists with physicians and surgeons, psychiatrists scored higher on items of neuroticism, openness, and agreeableness, but lower on conscientiousness [48].

A negative working environment can lead to physical and mental diseases [1]. Studies in psychiatric hospitals have reported that psychiatrists, psychiatry trainees, and psychiatric nurses have a highly stressful occupation [7]. Of the three groups, the psychiatry trainees' group is the most vulnerable, showing a high prevalence of anxiety disorders [20]. Psychiatrists and psychiatric nurses exhibited a prevalence of depression, burnout, and anxiety [49]. Moreover,

we found high-load mental problems in the observed variables of depression (0.83), anxiety (0.81), somatization (0.78), and interpersonal sensitivity (0.84). As already mentioned, mental health professionals are exposed to high levels of stress with special characteristics in their area [11]. Lazarus and Folkman developed a transactional model that proposes a definition of stress centered on the interaction between the individual and their environment [50]. To this end, an evaluation of the organism is carried out in two parallel directions: one towards the environment, and the other towards one's own resources [50]. Stress (distress) occurs when the person values their resources as scarce and insufficient to cope with environmental demands. In accordance with the above, there is perhaps a personal sensitivity that leads to the perception of stressors in a certain way, resulting in interpersonal site relationships (which could be related to interpersonal sensitivity variables of SCL-90) [32]. Moreover, somatization is a conversion of the mental state into physical symptoms, meaning that all emotions have a physical component, in the absence of a known medical condition. Various studies have reported that psychosomatic symptoms can be related to multiple factors, including stress, depression, anxiety, and personality disorders [51]. If work-related stress reaches a state of distress, depression, anxiety, somatization, and interpersonal sensitivity can be developed, as shown in our results.

The central idea of this study was based on the antecedents mentioned by the Karasek's "Demand-control" and Siegrist's "Effort-Reward Imbalance" [26,30], served as the basis for proposing an analytical model; one way was to use the structural equations approach. This model consists of parameterizing the subjectivities by operationalizing the constructs (latent variables) through the observed variables measured through the psychometric instruments [52]. From the results obtained, we can confirm how all the estimated loads of the observed variables were high and positive with their respective latent variables. With the analytical and adjusted model of the structural equation, we explored causal explanations for the generation of distress and identified a strong and significant effect from Stress to Distress in the model.

The model obtained also confirmed the influence of the variables that constitute stress due to work issues based on the theoretical assumptions' Karasek "Demand-control", i.e., the psychological demand that the perceived workload represents for the individual, including the amount of work, the pressure, and the time limits; in our study, these were measured through observed variables such as: (a) emotional exhaustion, referred to as those conditions that affect the individual and leave them exhausted at the end of a day, because they generate tension due to the responsibility for the task or for the fatigue that the workload represents; (b) lack of satisfaction of the professional practice under the conditions provided by the institution; (c) lack of motivation in finding the time to provide quality care, and even creating frustration regarding the possible expectations of professional growth; (d) work overload or feeling overwhelmed by the amount and effort that the activities involve; and (e) the referred aspects of professional demerit or not feeling valued in their performance, or believing that the recognition is not satisfactory.

Limitations

The findings of this study should be interpreted with caution because it only investigates mental health professionals from one hospital in Mexico City, in this way the total sample size was 100 participants, which could have been a limitation because the results are not representative of the entire Mexico City mental health professional's workforce. Another limitation of our study is that we collected data from physicians and nurses working in Mexico, the extent to which our data can be transferred to other countries are unclear because the results reflect the specific work environment of health mental hospital.

Conclusion

We conclude that the model obtained allows know the predictors in labor and organizational matters that can induce emotional exhaustion and lead to psychopathology development. In this sense, the work context of mental health professionals requires early interventions to care for the mental health of these workers.

The interventions could provide infographics (red flags), checklists, or short and preferably graphic materials (that promote interest and easy attention) for self-care of mental health; as well as to encourage the use of restorative spaces, preferably with access to nature, that allow them to relax, establish links with their peers and develop social cohesion. In addition the promotion by the institution a) the recognition of work performance, b) the development of policies that provide spaces for the evaluation of the mental health of mental health providers, c) the detection of risks or cases at risk of emotional exhaustion that require professional support, d) therapeutic alternatives that can provide opportunities to get away from the situation that generates distress temporarily.

References

1. Hassard J, Kevin T, Tom C, Cosmar M, Gründler R, Flemming D, Cosemans B, van den Broek K. Calculating the cost of work-related stress and psychosocial risks. Technical Report. Publications Office of the European Union, Luxembourg, 2014.

2. Heponiemi T, Aalto AM, Puttonen S, Vänskä J, Elovainio M. Work-related stress, job resources, and well-being among psychiatrists and other medical specialists in Finland. Psychiatr Serv. 2014 Jun 1;65(6):796-801. doi: 10.1176/appi.ps.201300200. PMID: 24585088.

3. Memish K, Martin A, Bartlett L, Dawkins S, Sanderson K. Workplace mental health: An international review of guidelines. Prev Med. 2017 Aug;101:213-222. doi: 10.1016/j.ypmed.2017.03.017. Epub 2017 Mar 25. PMID: 28347696.

4. Lu S, Wei F, Li G. The evolution of the concept of stress and the framework of the stress system. Cell Stress. 2021 Apr 26;5(6):76-85. doi: 10.15698/cst2021.06.250. PMID: 34124582; PMCID: PMC8166217.

5. Anon. Workplace stress : a collective challenge. [1st ed.]. Geneva: ILO. 2016.

6. Hertzum M. How Demanding Is Healthcare Work? A Meta-Analytic Review of TLX Scores. Stud Health Technol Inform. 2021 Nov 8;286:55-59. doi: 10.3233/SHTI210637. PMID: 34755690.

7. Rössler W. Stress, burnout, and job dissatisfaction in mental health workers. Eur Arch Psychiatry Clin Neurosci. 2012 Nov;262 Suppl 2:S65-9. doi: 10.1007/s00406-012-0353-4. Epub 2012 Aug 28. Erratum in: Eur Arch Psychiatry Clin Neurosci. 2016 Jun;266(4):381. PMID: 22926058.

8. Soltanifar A, Pishbin E, Attaran Mashhadi N, Najaf Najafi M, Siahtir M. Burnout among female emergency medicine physicians: A nationwide study. Emerg Med Australas. 2018 Aug;30(4):517-522. doi: 10.1111/1742-6723.12941. Epub 2018 Feb 13. PMID: 29436766.

9. Paradies Y. A theoretical review of psychosocial stress and health. In Role of Stress in Psychological Disorders. Nova Science Publishers. 2011; 1-20.

10. IMSS. Estres Laboral (Work stress). 2021]; http://www.imss.gob.mx/salud-en-linea/estres-laboral.

11. Kumar S. Burnout and psychiatrists: what do we know and where to from here? Epidemiol Psychiatr Sci. 2011 Dec;20(4):295-301. doi: 10.1017/s204579601100059x. PMID: 22201205.

12. Mark G, Smith AP. Occupational stress, job characteristics, coping, and the mental health of nurses. Br J Health Psychol. 2012 Sep;17(3):505-21. doi: 10.1111/j.2044-8287.2011.02051.x. Epub 2011 Sep 14. PMID: 22107162.

13. Brower KJ. Professional Stigma of Mental Health Issues: Physicians Are Both the Cause and Solution. Acad Med. 2021 May 1;96(5):635-640. doi: 10.1097/ACM.0000000000003998. PMID: 33885412; PMCID: PMC8078109.

14. Krishnan KS, Raju G, Shawkataly O. Prevalence of Work-Related Musculoskeletal Disorders: Psychological and Physical Risk Factors. Int J Environ Res Public Health. 2021 Sep 4;18(17):9361. doi: 10.3390/ijerph18179361. PMID: 34501950; PMCID: PMC8430476.

15. Mata DA, Ramos MA, Bansal N, Khan R, Guille C, Di Angelantonio E, Sen S. Prevalence of Depression and Depressive Symptoms Among Resident Physicians: A Systematic Review and Meta-analysis. JAMA. 2015 Dec 8;314(22):2373-83. doi: 10.1001/jama.2015.15845. PMID: 26647259; PMCID: PMC4866499.

16. Rugulies R, Aust B, Madsen IE. Effort-reward imbalance at work and risk of depressive disorders. A systematic review and meta-analysis of prospective cohort studies. Scand J Work Environ Health. 2017 Jul 1;43(4):294-306. doi: 10.5271/sjweh.3632. Epub 2017 Mar 17. PMID: 28306759.

17. Theorell T, Hammarström A, Aronsson G, Träskman Bendz L, Grape T, Hogstedt C, Marteinsdottir I, Skoog I, Hall C. A systematic review including meta-analysis of work environment and depressive symptoms. BMC Public Health. 2015 Aug 1;15:738. doi: 10.1186/s12889-015-1954-4. PMID: 26232123; PMCID: PMC4522058.

18. Jovanović N, Podlesek A, Volpe U, Barrett E, Ferrari S, Rojnic Kuzman M, Wuyts P, Papp S, Nawka A, Vaida A, Moscoso A, Andlauer O, Tateno M, Lydall G, Wong V, Rujevic J, Platz Clausen N, Psaras R, Delic A, Losevich MA, Flegar S, Crépin P, Shmunk E, Kuvshinov I, Loibl-Weiß E, Beezhold J. Burnout syndrome among psychiatric trainees in 22 countries: Risk increased by long working hours, lack of supervision, and psychiatry not being first career choice. Eur Psychiatry. 2016 Feb;32:34-41. doi: 10.1016/j.eurpsy.2015.10.007. Epub 2016 Jan 21. PMID: 26802982.

19. Lai R, Plakiotis C. Stress and Wellbeing of Psychiatry Trainees: A Literature Review. Adv Exp Med Biol. 2020;1195:117-126. doi: 10.1007/978-3-030-32633-3_16. PMID: 32468466.

20. Fresán A, Guízar-Sánchez D, Yoldi-Negrete M, Robles-García R, Tovilla-Zárate CA, Heinze G, Medina-Mora ME. Identifying Risk Factors for Self-reported Mental Health Problems in Psychiatry Trainees and Psychiatrists in Mexico. Acad Psychiatry. 2021 Dec;45(6):698-707. doi: 10.1007/s40596-021-01506-y. Epub 2021 Jul 21. PMID: 34291434; PMCID: PMC8294267.

21. Pilkinton P, Etkin M. Encountering suicide: the experience of psychiatric residents. Acad Psychiatry. 2003 Summer;27(2):93-9. doi: 10.1176/appi.ap.27.2.93. PMID: 12824109.

22. Garrosa E, Rainho C, Moreno-Jiménez B, Monteiro MJ. The relationship between job stressors, hardy personality, coping resources and burnout in a sample of nurses: a correlational study at two time points. Int J Nurs Stud. 2010 Feb;47(2):205-15. doi: 10.1016/j.ijnurstu.2009.05.014. Epub 2009 Jul 10. PMID: 19596324.

23. McTiernan K, McDonald N. Occupational stressors, burnout and coping strategies between hospital and community psychiatric nurses in a Dublin region. J Psychiatr Ment Health Nurs. 2015 Apr;22(3):208-18. doi: 10.1111/jpm.12170. Epub 2014 Dec 9. PMID: 25490860.

24. Hawton K, Clements A, Sakarovitch C, Simkin S, Deeks JJ. Suicide in doctors: a study of risk according to gender, seniority and specialty in medical practitioners in England and Wales, 1979-1995. J Epidemiol Community Health. 2001 May;55(5):296-300. doi: 10.1136/jech.55.5.296. PMID: 11297646; PMCID: PMC1731901.

25. Smith TW, Spiro A. III. Personality, health, and aging: Prolegomenon for the next generation. Journal of Research in Personality. 2002; 36(4): 363−394. https://doi.org/10.1016/S0092-6566(02)00014-4

26. Karasek RA. Job Demands, Job Decision Latitude, and Mental Strain: Implications for Job Redesign. Administrative Science Quarterly. 1979; 24: 285-308. http://dx.doi.org/10.2307/2392498

27. Sanne B, Mykletun A, Dahl AA, Moen BE, Tell GS. Testing the Job Demand-Control-Support model with anxiety and depression as outcomes: the Hordaland Health Study. Occup Med (Lond). 2005 Sep;55(6):463-73. doi: 10.1093/occmed/kqi071. Epub 2005 Apr 21. PMID: 15845554.

28. Stansfeld S, Candy B. Psychosocial work environment and mental health--a meta-analytic review. Scand J Work Environ Health. 2006 Dec;32(6):443-62. doi: 10.5271/sjweh.1050. PMID: 17173201.

29. Flynn N, James JE. Relative effects of demand and control on task-related cardiovascular reactivity, task perceptions, performance accuracy, and mood. Int J Psychophysiol. 2009 May;72(2):217-27. doi: 10.1016/j.ijpsycho.2008.12.006. Epub 2008 Dec 14. PMID: 19118584.

30. Siegrist J. Adverse health effects of high-effort/low-reward conditions. J Occup Health Psychol. 1996 Jan;1(1):27-41. doi: 10.1037//1076-8998.1.1.27. PMID: 9547031.

31. Hernández González AI, Ortega Andeane RP, Reidl Martínez LM. Validation of the work stress instrument for Mexican doctors. En-keys of thought. 2012; 6(11): 113-129.

32. Derogatis LR. Scl-90-r: symptom checklist-90-r : administration scoring and procedures manual (3rd ed.); 1975. NCS Pearson.

33. Bentler PM. EQS 6 structural equations program manual. Encino, CA: Multivariate Software, 2006.

34. Hoe SL. Issues and procedures in adopting structural equation modelling technique. Journal of Quantitative Methods Research Collection School Of Computing and Information Systems. 2008; 3:(1): 76-83.

35. Fothergill A, Edwards D, Burnard P. Stress, burnout, coping and stress management in psychiatrists: findings from a systematic review. Int J Soc Psychiatry. 2004 Mar;50(1):54-65. doi: 10.1177/0020764004040953. PMID: 15143847.

36. Romero-González A, Aldrete-Velasco J, Pedraza-Chávez J, Reyes-Zavala C. Burnout syndrome in Mexican health professionals. Doctors: martyrs or victims of their profession?Med Int Méx. 2021; 37 (3): 343-358. https://doi.org/10.24245/mim. v37i3.3826

37. Díaz-Castro L, Cabello-Rangel H, Medina-Mora ME, Berenzon-Gorn S, Robles-García R, Madrigal-de León EÁ. Necesidades de atención en salud mental y uso de servicios en población mexicana con trastornos mentales graves [Mental health care needs and use of services in Mexican population with serious mental disorders]. Salud Publica Mex. 2020 Jan-Feb;62(1):72-79. Spanish. doi: 10.21149/10323. PMID: 31869563.

38. Leider JP, Harper E, Shon JW, Sellers K, Castrucci BC. Job Satisfaction and Expected Turnover Among Federal, State, and Local Public Health Practitioners. Am J Public Health. 2016 Oct;106(10):1782-8. doi: 10.2105/AJPH.2016.303305. Epub 2016 Aug 23. PMID: 27552269; PMCID: PMC5024370.

39. Quora. How do Mexican doctors compare to American or Canadian doctors? 2017; 2021: https://www.quora.com/How-do-Mexican-doctors-compare-toAmerican-or-Canadian-doctors.

40. Adzei FA, Atinga RA. Motivation and retention of health workers in Ghana's district hospitals: addressing the critical issues. J Health Organ Manag. 2012;26(4-5):467-85. doi: 10.1108/14777261211251535. PMID: 23115900.

41. Muthuri RNDK, Senkubuge F, Hongoro C. Determinants of Motivation among Healthcare Workers in the East African Community between 2009-2019: A Systematic Review. Healthcare (Basel). 2020 Jun 10;8(2):164. doi: 10.3390/healthcare8020164. PMID: 32532016; PMCID: PMC7349547.

42. Jaimes EIG, Saucedo EP. Working conditions and professional burnout in health workers. Alternatives in Psychology. 2012; 16(27): 08-22.

43. Coyne I, Seigne E, Randall P. Predicting workplace victim status from personality. European Journal of Work and Organizational Psychology. 2000; 9(3): 335–349. https://doi.org/10.1080/135943200417957

44. Grant S, Langan-Fox J. Personality and the occupational stressor-strain relationship: the role of the Big Five. J Occup Health Psychol. 2007 Jan;12(1):20-33. doi: 10.1037/1076-8998.12.1.20. PMID: 17257064.

45. Maggiori C, Johnston CS, Rossier J. Contribution of personality, job strain, and occupational self-efficacy to job satisfaction in different occupational contexts. Journal of Career Development. 2016; 43(3): 244-259. https://doi.org/10.1177/0894845315597474

46. Widiger TA, Oltmanns JR. Neuroticism is a fundamental domain of personality with enormous public health implications. World Psychiatry. 2017 Jun;16(2):144-145. doi: 10.1002/wps.20411. PMID: 28498583; PMCID: PMC5428182.

47. Stefa-Missagli S, Unterrainer HF, Giupponi G, Holasek SJ, Kapfhammer HP, Conca A, Sarlo M, Erbuto D, Rogante E, Moujaes-Droescher H, Davok K, Berardelli I, Krysinska K, Andriessen K, Lester D, Pompili M. Suicide and Personality Traits: A Multicenter Study of Austrian and Italian Psychiatric Patients and Students. Suicide Life Threat Behav. 2020 Feb;50(1):220-232. doi: 10.1111/sltb.12579. Epub 2019 Sep 3. PMID: 31479172.

48. Surbeck W, Samuel R, Spieler D, Seifritz E, Scantamburlo G, Stienen MN, Scholtes F. Neurologists, neurosurgeons, and psychiatrists' personality traits: a comparison. Acta Neurochir (Wien). 2020 Mar;162(3):461-468. doi: 10.1007/s00701-020-04233-9. Epub 2020 Jan 24. PMID: 31980949.

49. Papathanasiou IV, Tsaras K, Kleisiaris CF, Fradelos EC, Tsaloglidou A, Damigos D. Anxiety and Depression in Staff of Mental Units: The Role of Burnout. Adv Exp Med Biol. 2017;987:185-197. doi: 10.1007/978-3-319-57379-3_17. PMID: 28971458.

50. Lazarus RS, Folkman S. Cognitive theories of stress and the issue of circularity. In MH. Appley & R Trumbull (Eds.), Dynamics of stress: Physiological, psychological and social perspectives. Plenum Press. 1986; 63-80.

51. Mostafaei S, Kabir K, Kazemnejad A, Feizi A, Mansourian M, Hassanzadeh Keshteli A, Afshar H, Arzaghi SM, Rasekhi Dehkordi S, Adibi P, Ghadirian F. Explanation of somatic symptoms by mental health and personality traits: application of Bayesian regularized quantile regression in a large population study. BMC Psychiatry. 2019 Jul 3;19(1):207. doi: 10.1186/s12888-019-2189-1. PMID: 31269925; PMCID: PMC6610832.

52. Vargas D. Methodological aspects for social research. Structural equation models. 2019, Mexico: UNAM.