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Work-related stress risk and preventive measures of mental disorders in the medical environment: an umbrella review

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Abstract. – OBJECTIVE: Work-related stress (WRS) is widespread among medical doctors. WRS not only affects the physician's mental and physical well-being, but also patient care quality and the overall efficiency of the healthcare system. The aim of this study is to conduct a systematic review of the current preventive measures against mental disorders, work-related stress, and burnout among physicians.

MATERIALS AND METHODS: The presentation of this systematic review is in accordance with the PRISMA statement. The methodological quality of the selected studies was assessed with specific rating tools: INSA, Newcastle Ottawa Scale, JADAD scale, and AMSTAR. English publications only were selected. No restrictions applied for publication type. Reviewers excluded articles not concerning the following topics: WRS prevention, WRS risk factors and mental disorders among physicians. Reviewers also excluded findings of less academic significance, editorial articles, individual contributions, purely descriptive studies published in scientific conferences.

RESULTS: Online search returned 4748 references on the following databases: PubMed (1638), Scopus (3108) and Cochrane Library (2). 36 studies were included in this review (thereof, 13 reviews and 23 original articles). Narrative reviews were rated on the INSA scale. The mean, median, and modal rating was 6. This indicates an intermediate-high quality of these studies. Systematic reviews were rated on the AMSTAR scale. The mean and median rating was 9, and the modal rating was 8. This indicates a high quality of these studies. The scores assigned to the original articles have a mean, median, and modal rating of 7. This also indicates an intermediate-high quality of these studies.

CONCLUSIONS: Work-related stress and mental disorders seem to be widespread among medical practitioners. It is already a priority to adopt preventive measures against these phenomena. However, there is still no consensus on what the most effective measures are. Additional research is needed to formulate evidence-based recommendations.

Key Words:
Work-related stress, Mental disorders, Preventive measures, Psychosocial risks, Physicians, Doctors.

Introduction

The World Health Organization defines work-related stress (WRS) as "a condition characterized by physical, psychological or social suffering or dysfunction, which arises from the feeling of not being able to respond to requests or to live up to expectations[1]".

WRS is a complex phenomenon that arises from the interaction of several psychosocial risk factors. These are related to work organization, work content, workload, control, night shifts, role, change in environmental conditions and employee's skills and needs. Individual factors also play an important role in the development of WRS and burnout[2-4].

In May 2019, the World Health Organization classified workplace-related burnout as an occupational phenomenon. This often results from chronic stress at work that has not been success-

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fully managed. As a result, burnout has been included in the 11th Revision of the International Classification of Diseases (ICD-11)[5]. Chronic exposure to these risk factors has been associated with a wide range of physical disorders including back pain, chronic fatigue, digestive problems, alcohol consumption, autoimmune diseases, impaired immune function, cardiovascular diseases, hypertension, irritable bowel syndrome, and dermatitis[6-15].

Nonetheless, WRS mostly affects mental health: anxiety, burnout, depression, suicide attempts, and sleep disorders are becoming increasingly common among healthcare workers[16,17]. Several studies[18,19] already recognize the association between depression and WRS. Depression greatly impacts individual well-being and carries a huge economic burden. The Matrix report[20] estimated a loss of 617 billion euros/year.

Anxiety frequently co-presents with depression. Both are influenced by individual factors such as age, gender, and marital status. Unfortunately, gender seems to play an important role. It has been described that female workers are more likely to cover less prestigious roles, receive lower salaries and report an overall lower job satisfaction[21,22].

Work-related stress and burnout are widespread among healthcare workers[23,24], in particular among medical doctors[25,26]. Those working in the Emergency Departments[27-30] seem to be affected the most, but other specialties are also affected to variable degrees. These include cardiologists[31,32], pediatricians[33], oncologists[34], gynecologists[35], radiation therapists[36], plastic surgeons[37], and anesthesiologists[38,39].

WRS not only affects physical and mental well-being (feeling tired, exhausted, fatigued, inattentive, and irritable; mood disorders, depression; increased risk for substance/alcohol abuse, increased risk for suicidal ideation)[40], but also affects patient care quality (e.g., failure of interpersonal relationships, increased medical errors, increased risk of malpractice, reduced patient satisfaction)[41,42] and the efficiency of the healthcare system (e.g., absenteeism and job quitting)[43].

As our research group has confirmed before, WRS is generally evaluated with the mean of questionnaires, which help to identify risk factors. This in turn helps to formulate specific corrective interventions[44].

In this study, authors systematically reviewed the available literature on work-related stress among physicians. The first aim was to describe the risk factors of WRS. The second aim was to describe common strategies adopted to prevent mental disorders and improve quality of life and overall well-being among medical practitioners.

Materials and Methods

The presentation of this systematic review is in accordance with the PRISMA statement[45].

Literature Research

This review includes articles published on the major online databases (PubMed, Scopus, Cochrane Library) from 2000 until May 2019. Search queries included a combination of the following keywords: physicians, doctors, prevention, work related stress, mental disorders, mental, burnout, work, occupational (Table I).

All search fields were considered. Additionally, we practiced a hand search on reference lists of the selected articles and reviews for a wider analysis. Two independent reviewers (SDS and FC) performed the search and read the titles and abstracts of the articles identified by the search strategy. Relevant reports were selected according to inclusion and exclusion criteria. Doubts or disagreements between the two reviewers were solved through arbitration with two other researchers (GB and RP). Finally, full articles were assessed independently to determine definitive eligibility (Figure 1).

Quality Assessment

Three different reviewers (SDS – HN – FC) assessed the methodological quality of the select-

Table I. Search strings.

1	Physicians AND prevention AND "work related stress"
2	Doctors AND prevention AND "work related stress"
3	Doctors AND mental AND prevention
4	Physicians AND mental AND prevention
5	Physicians AND prevention AND burnout
6	Doctors AND prevention AND burnout
7	Work AND "work related stress" AND doctors
8	Work AND "work related stress" AND physicians
9	"Mental disorders" AND physicians
10	"Mental disorders" AND doctors
11	Occupational AND physicians AND "mental disorders"
12	Occupational AND doctors AND "mental disorders"
13	Doctors AND work AND "mental disorders"
14	Physicians AND work AND "mental disorders"

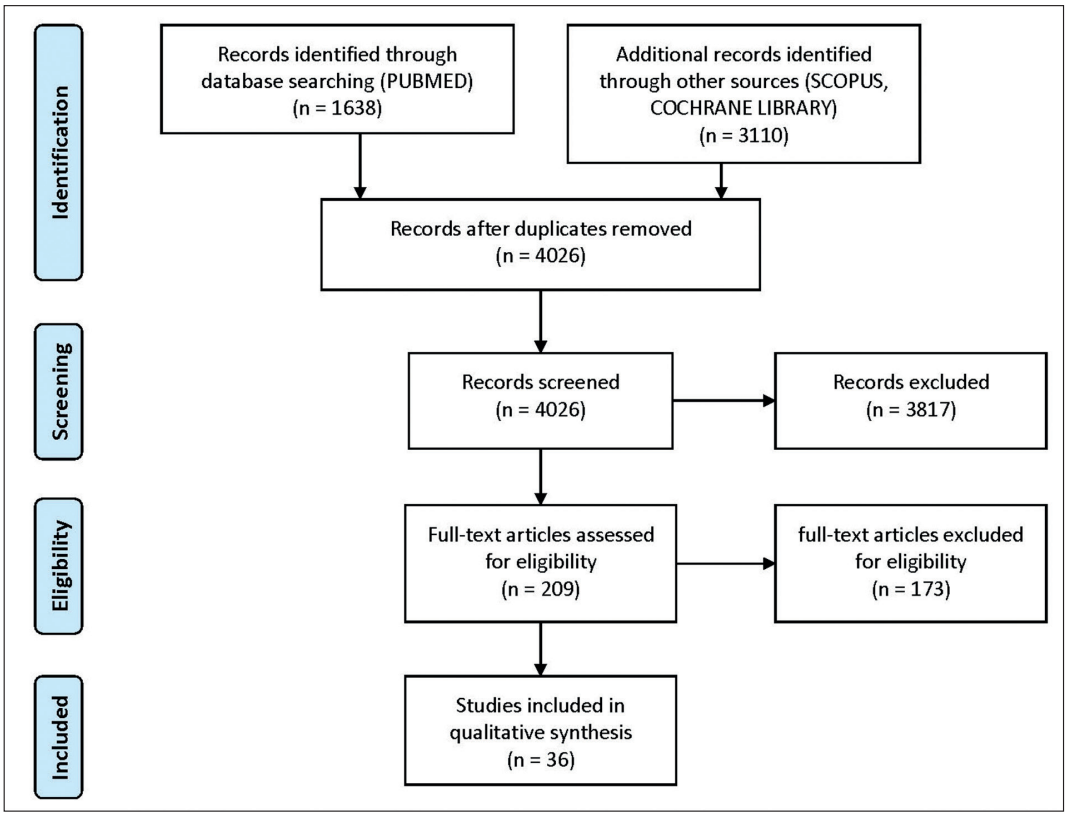

Figure 1. PRISMA flow diagram.

ed studies with specific rating tools. Reviewers used the "INSA" method (International Narrative Systematic Assessment)[46] to assess the quality of narrative reviews and the "Newcastle Ottawa Scale" to evaluate cross-sectional and cohort studies[47]. The "JADAD scale" was used for randomized clinical trials[48]. The AMSTAR scale was used to assess the methodological quality of systematic reviews[49].

Eligibility and Inclusion Criteria

English publications only. The articles included in this review focus on work-related stress, burnout, and mental disorders among medical doctors, as well as the most effective and used preventive measures.

Exclusion Criteria

Reviewers excluded articles not concerned with the prevention of WRS, mental disorders, or WRS risk factors, as well as editorial articles, letters to the editor, individual contributions (i.e., conferences' speech), and purely descriptive studies published in scientific conferences without any quantitative and qualitative conclusion.

Risk of Bias Assessment

To reduce bias, reviewers used multiple tools to evaluate the quality of the included studies. This evaluation was carried out by two independent reviewers (SDS and HN). Disagreement between the two reviewers was solved through arbitration with the other authors.

Results

The online search returned 4748 references on the following databases: PubMed (1638), Scopus (3108), and Cochrane Library (2). 722 references were duplicates and were excluded. 3817 references were excluded because they were unrelated to the topics of interest (WRS prevention, burnout or mental disorders among physicians). Of the remaining 209, 173 references did not meet the inclusion criteria (Figure 1).

Ultimately, 36 studies were included in this review (Table II). They consist of 8 narrative reviews (average INSA score of 6), 5 systematic reviews (average AMSTAR score of 9) and 23 original articles (21 articles with an average NEWCASTLE OTTAWA SCALE score of 7, 1 article with

Table II. Included studies and methodological quality assessment score.

Authors	Study design	Country	Year	Score
1. Sargent et al[70]	Cohort study	USA	2004	N5
3. Rø et al[80]	Cohort study	Norway	2007	N7
4. Embriaco et al[39]	Cohort study	France	2007	N7
5. Krasner et al[67]	Before-and-after study	USA	2009	N7
6. Rosen et al[62]	Narrative review	Australia	2009	I6
7. Lemaire and Wallace[78]	Mixed methods study	Canada	2010	NA
8. Van Wyk et al[55]	Systematic review	South Africa	2010	A8
9. Lemaire et al[82]	Case-control study	Canada	2011	N5
10. Nooryan et al[84]	Case-control Study	Iran	2011	N6
11. Tsai and Liu[64]	Cohort study	Taiwan	2012	N10
12. Shanafelt and Dyrbye[60]	Narrative review	USA	2012	I6
13. Li et al[83]	Case-control study	Germany	2013	N5
14. Fortney et al[68]	Cohort study	USA	2013	N8
15. Ruotsalainen et al[56]	Systematic review	Finland	2014	A9
16. Gunasingam et al[74]	Prospective case-control	Australia	2015	N7
17. Facey et al[61]	Systematic review	Australia	2015	A8
18. West et al[58]	Narrative review	USA	2016	I6
19. Schrijver[57]	Narrative review	USA	2016	I5
20. Beresford et al[73]	Observational study	UK	2016	N6
21. Bernburg et al[81]	Randomized controlled trial	Germany	2016	J4
22. Luken and Sammons[65]	Systematic review	USA	2016	A9
23. Hall et al[76]	Cohort study	UK	2017	N7
24. Mache et al[71]	Cohort study	Germany	2017	N6
25. Mache et al[77]	Prospective case-control	Germany	2017	N8
26. Hamilton et al[66]	Before-and-after study	UK	2018	N8
27. Brooks et al[69]	Cohort study	USA	2018	N8
28. Abraham et al[79]	Cross-sectional study	Australia	2018	N5
29. Murali and Banerjee[51]	Narrative review	UK	2018	I7
30. Fredd et al[54]	Narrative review	Houston	2018	I6
31. Panagioti et al[63]	Narrative review	UK	2018	I5
32. Lapointe et al[53]	Prospective cohort	USA	2018	N10
33. Kalani et al[58]	Systematic review	Iran	2018	A10
34. Firulescu et al[72]	Cohort study	USA	2019	N6
35. Locke and Lees[50]	Narrative review	UK	2019	I7
36. Popa-Velea et al[75]	Prospective case-control	Romania	2019	N7

I: INSA Scale; N: Newcastle Ottawa Scale; J: JADAD Scale; A: AMSTAR Scale; NA: Not Applicable.

a JADAD score of 4, 1 article with not applicable scoring). Among the original articles, 2 were before-and-after studies, 6 were case-control studies, 11 were cohort studies, 2 were cross-sectional studies and 4 were other kind of studies. The study by Lemaire and Wallace was not assessed for quality because the Newcastle Ottawa Scale was not applicable.

WRS risk factors and preventive measures are grouped together to summarize the results. (Table III and IV).

Narrative and Systematic Reviews

The narrative reviews reported an average, median, and modal INSA score of 6 (Table II). This indicates intermediate-high quality of these studies. Those carried out in the UK were rated the highest (average INSA score of 7). Their findings are consistent with those of other studies. "High workload" was identified as risk factor for WRS in 87.5% of studies. This was followed by "lack of autonomy/control" (75%), "work time" (62,5%), "sense of powerlessness", and "low support from colleagues/superiors" (50%). Other variables were linked to the organization and career: excessive bureaucracy, reward system, and career opportunities.

The most useful and effective preventive strategies described in narrative reviews were "mindfulness-based" and "support groups" (75%). Less frequently adopted strategies were "collective interventions" (such as workload and work hours reduction) and individually-targeted interventions (37,5%).

Table III. Risk factors for work-related stress.

Source of stress	Examples
Role	Conflicts, violence, responsibility, role ambiguity, sense of powerlessness
Relationships	Colleagues' support, senior's support, subordinates (e.g. nurses), communication, bullying
Control	Limited control over the practice, dissatisfaction, lack of autonomy
Factors intrinsic to the job	Workloads, shift work (night shifts in particular), work time, medical errors, medico-legal concerns
Organizational environment	Participation in decision making, inadequate leisure time, excessive bureaucracy, absenteeism, reward system
Career	Job security, career opportunities, promotion prospects/salary, unpaid overtime
Psychological individual factors	Explanatory style (optimistic vs. pessimistic), chronic negative emotions (anxiety, depression etc.), type A personalities (ambition, competitiveness, hostility, anger and irritation)

The systematic reviews reported a mean and median AMSTAR score of 9, and a modal score of 8. This indicates high quality of the studies. The study carried out in Iran was rated the highest (AMSTAR score of 10) (Table II). All systematic reviews described individual psychological traits as risk factors for the development of WRS. The preventive measures described all belonged to the category "mindfulness-based".

Original Articles

These articles reported a mean, median, and modal rating of 7 (Table II). This demonstrates intermediate-high quality of these studies. The studies conducted in the USA and in Taiwan obtained the highest ratings (10). The main risk factors linked to WRS were "high workloads and work hours", "poor relationships/conflicts", "low support" (both from colleagues and superiors), as well as factors linked to career and job security.

In 56.5% of the articles, collective interventions were the most used preventive strategies. These included "Support groups", "Reducing working hours", and "Debriefing sessions". Individually-targeted interventions and mindfulness-based strategies were used in 39% and 35% of cases, respectively. Most original articles (14 out of 23) evaluated burnout risk; 10 used the Maslach Burnout Inventory (MBI), while others used non-validated questionnaires.

Ten studies out of 23 investigated WRS, but only 6 of them used validated and specific questionnaires, such as the Perceived Stress Scale (PSS) or Karasek Job Content Questionnaire (JCQ). Seven studies only focused on mental disorders affecting physicians; these disorders include anxiety, depression, alcohol/drugs abuse, suicidal intentions, and others.

Discussion

The first aim of this review was to describe the risk factors of WRS among physicians. The second aim was to describe the most common strategies adopted to prevent WRS among the same population. In terms of quality of the studies, two narrative reviews were rated the highest on the INSA scale[50,51]. Locke et al[50] recommend coping strategies, solutions focused (CSF), and reflective groups instead of mindfulness-type interventions. In fact, the latter often imply huge costs for the host organization and potentially for participants themselves. Murali et al[51] present organizational and collective interventions as the most effective strategies to reduce workload and promote

Table IV. Preventive measures.

Collective interventions	Individually-targeted interventions	Mindfulness-based strategies
Support groups	Mentoring	Cognitive behavioral therapy
Teambuilding	Physical activity	Counselling programs
Debriefing sessions	Self-care training	Psychosocial support
Reduce work hours	One-to-one supervision	Meditation

self-awareness and self-care among physicians. Two original articles were rated the highest on the Newcastle-Ottawa scale[52,53]; Palhares-Alves et al[52] describe psychiatric counselling as a strategy to diagnose mental disorders early; Lapointe et al[53] describe excessive workload as an important risk factor for stress at work. The adoption of electronic communication systems could reduce the workload and therefore the risk for WRS. However, Fredd and Scheid[54] found that the use of an Electronic Health Record (EHR) increases the burnout risk both for both junior and senior physicians. Other risk factors include the loss of autonomy, over-reliance on computer data, onerous rules, asymmetric reward system, and a sense of powerlessness. Two Cochrane reviews have also been included in our study. Van Wyk and Pillay-Van Wyk[55] analyzed 10 randomized controlled trials on the interventions to support healthcare workers in coping with work-related stress, preventing burnout, and improving job satisfaction. The total sample consists of 716 participants. The authors conclude that there is insufficient scientific evidence to recommend stress management techniques as a mean to reduce the burnout risk among physicians. There is weak evidence that management interventions could improve job satisfaction and staff absenteeism. Ruotsalainen et al[56] conclude that: "there is low-quality evidence that CBT (cognitive-behavioral training) and mental and physical relaxation reduce stress more than no intervention but not more than alternative interventions. There is also low-quality evidence that changing work schedules may lead to a reduction of stress. Other organizational interventions have no effect on stress levels". Their Cochrane review was published in 2014 and included 7188 healthcare workers. Schrijver et al[57] studied the prevalence of burnout and stress among US physicians. They extrapolated the data from large "US Physician Satisfaction Surveys" published between 1996 to 2014. They conclude that the optimization of physician well-being requires a personalized approach, tailored to the career phase, physician specialty, and practice setting; personal approaches can include mindfulness training and participation in peer support groups. Similarly, West et al[58] conclude that both individually-oriented and organizationally-oriented strategies can result in clinically meaningful reductions in burnout among physicians. As a result, reaching conclusions about the effectiveness of interventions on physician burnout risk is not easy. In fact, multiple variables probably influence the effectiveness of these interventions[59]. Different medical professionals have been studied: cardiologists, surgeons, pediatricians, general practitioners, oncologists[60], and other professionals, such as postgraduate year one doctors (PGY1). Facey et al[61] recruited PGY1 to investigate risk factors for work-related psychological distress and the strategies designed to reduce it. They conclude there are few well-conducted studies on this topic. This makes it difficult to formulate a clear set of recommendations on how to deal with psychological distress at work. Furthermore, interventional strategies do not address stressors related to career progression. Rosen et al[62] focus their review on the treatment and care of medical practitioners suffering from mental illness and substance abuse, with special attention to psychiatrists. They advocate the following points: the need to develop peer support networks and specific recovery training programs; the importance of involving families and colleagues of impaired medical practitioners; inviting organizations to offer training modules about medical practitioner resilience, stress management, self-sustaining, work-life balance, and early recognition of and response to burnout. Panagioti et al[63] studied the source of burnout among cardiologists. They state that the combination of organizational strategies and individual stress reduction techniques can mitigate burnout and promote physician's wellness. They add that this responsibility should be shared by both the healthcare system and the individual. Tsai et al[64] studied health care workers (nurses, physicians, technicians) of a big hospital. They show the usefulness of health-promoting programs as preventive measures against mental disorders. Most of the studies[65] with the highest scores evaluated the efficacy of mindfulness-based strategies. The two before-and-after reports[66,67] dealt with mindfulness-based cognitive therapy (MBCT) and primary care physicians: both studies used the Maslach burnout inventory to assess burnout. It was found that the participation to the course was associated with short-term and sustained improvements in well-being. This helped them to manage work pressures, feel more relaxed, enjoy their work, and experience greater empathy. Fortney et al[68] recruited a similar population and reached a similar conclusion: participation to abbreviated mindfulness courses was associated with reductions in indicators of job burnout, depression, anxiety, and stress. Brooks et al[69] suggest a comprehensive approach, including

personal support, peer-assistance programs, collegial interactions, mentorship, and work-based interventions. Similarly, many other studies[69,70] evaluated the efficacy of combinations of different preventive measures. Some of these investigations[70,71] focused on collective interventions, such as support groups and debriefing sessions; others on individually-targeted interventions, such as self-care competency training, training forgiveness[72] mentoring and stress management (coping) training[73-77]; some others[78,79] on mindfulness-based strategies, such as cognitive-behavioral counselling. Finally, three researches[80-82] describe two uncommon preventive measures as mean to fight anxiety. Li et al[83] underline the importance of improving occupational rewards, while Nooryan et al[84] support the use of courses to improve emotional intelligence. This is defined as the ability to monitor own emotions, as well as the emotions of others, to distinguish between and label different emotions correctly, and to use emotional information to guide thinking and behavior and influence that of others.

Conclusions

Work-related stress and mental disorders are increasingly common among medical professionals. It has become a priority to incorporate corrective measures and preventive strategies to limit the spread of these conditions. However, there is still no consensus on what the most effective strategies are. Additional research is needed to identify appropriate evidence-based measures to address physician distress at both the individual and organizational level. The authors conclude that there is no single approach or remedy suitable for all situations. It is always essential to perform a risk assessment to identify the risk factors and choose the best preventive measures for different contexts. Future studies will clarify which interventions or combinations of interventions are most appropriate for the medical professionals.

This review summarizes the strategies that medical doctors use to prevent psychological distress, burnout, and work-related stress (Table IV). However, there are a few limitations. The first limitation is the low number of studies matching the inclusion criteria. Furthermore, burnout and WRS are often quantified using non-validated or "non-specific" tools. As a result, making comparisons between studies is difficult. Then, this analysis did not consider protective factors for mental disorders, such as individual coping strategies, religion, family support, and involvement[85,86]. Similarly, demographic factors, such as gender, age, work age, licit and/or illicit drug abuse, and families have not been evaluated, even if they play a role in mitigating or worsening the psychosocial risk in physicians. Finally, authors found significant discrepancy among studies in terms of causal factors and recommended preventive measures. In other words, there is no consensus on how to deal with psychological distress in health care practitioners.

Conflict of Interest

The Authors declare that they have no conflict of interests.

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