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REVIEWS

THE ASSOCIATION BETWEEN BURNOUT AND METABOLIC DISORDERS

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ABSTRACT

INTRODUCTION: Professional burnout is an emotional and physical exhaustion closely related to stress that is not well managed. Initially considered to be specific to medical professionals, today burnout is spoken about in all spheres of social life. The development of the syndrome involves the physical condition, but outgrows or runs parallel to a dysfunctional change in the behavior of those affected.

AIM: The aim of this article is to analyze the relationship between burnout and metabolic disorders.

MATERIALS AND METHODS: To achieve the goal, an analysis of the PubMed and Google Scholar databases by keywords has been conducted.

RESULTS: Burnout is a result of occupational stress that is not well managed. Subjects with occupational burnout experience emotional exhaustion, which often develops into physical symptoms. Changes in sleep and exhaustion are more often detected in these individuals, which often develop into metabolic disorders. Studies prove a relationship between a high level of occupational stress and a number of markers: increased blood pressure (p=0.0), visceral obesity (p=0.03), low HDL (p=0.02), glycated hemoglobin, etc.

High levels of occupational stress are associated with low motivation to build healthy habits. A link between diabetes and burnout has been observed in the literature, both in patients and in their relatives. In this case, occupational burnout is a product of the need to conduct activities to control the condition. The main guidelines related to the development of diabetes burnout are: feelings of mental exhaustion and physical fatigue from self-care related to the condition, neglecting the condition, withdrawal from care and support for the diabetic patient, feeling powerless to deal with diabetic burnout, individual characteristics of the life-like situation, as a result of which the control and aggravation of the condition is reached.

CONCLUSION: Burnout can be a cause of metabolic disorders. On the other hand, diabetic patients and their relatives often suffer from burnout caused by the need to control the condition. It is necessary to carry out measures for the prevention of professional burnout to prevent the development of metabolic disorders, but also to help diabetic patients in the fight against the disease.

Keywords: *burnout, diabetes, metabolic disorders, occupational stress*

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INTRODUCTION

Burnout syndrome is described as emotional and physical exhaustion, accompanied by cognitive fatigue, caused by prolonged periods of stress (1). It mainly refers to chronic stress in a work environment that is not well managed, but additional factors also have an impact. For example: family conflicts, serious illnesses, etc. (2–4).

Initially considered a condition specific to medical professionals, today burnout is talked about in all spheres of social life. This syndrome is expressed in the fundamental interruption of the emotional and value connection between the employee and his work (5). In this regard, the World Health Organization (WHO) declared it an occupational phenomenon in the 11th revision of the International Classification of Diseases I 2019 (2). Manifestations of the syndrome are observed in three main directions: emotional exhaustion, depersonalization (in the sense of dehumanization), and reduction of personal achievements (2). Initially, the signs and symptoms of burnout are subtle, but they gradually progress (6,7). The development of the syndrome encompasses the physical condition, but outgrows or runs parallel to a dysfunctional change in the behavior of those affected.

Although according to WHO, burnout is not classified as a disease, it is important to recognize and distinguish this condition from clinical depression, anxiety, and post-traumatic stress disorder (PTSD) as the symptoms, causes, and treatments for each of these conditions can differ significantly. While burnout is often related to chronic workplace stress and results in emotional exhaustion, PTSD has deeper psychological and physiological impacts. Understanding these differences is essential for effective treatment and appropriate diagnosis (4,8).

A number of studies have consistently demonstrated a significant relationship between long-lasting burnout and an increased risk of developing certain cardiovascular diseases and metabolic disorders, highlighting how chronic burnout can have detrimental effects on both heart health and metabolic function. Individuals experiencing prolonged burnout are more likely to have increased levels of triglycerides, which can contribute to increased low-density lipoproteins, higher total cholesterol, and an increase in fasting glucose levels (6,9,10).

An example of the direct influence of the burnout syndrome on the behavior of patients and the course of their disease is diabetes. It is a socially significant chronic disease requiring serious and consistent control of blood sugar levels by the patient (11). The patients must take the necessary medications daily and follow a certain lifestyle. This affects their psychoemotional state and can lead to symptoms of burnout (12,13). Burnout in diabetes is described as a feeling of physical and mental exhaustion, powerlessness, and dissatisfaction with the daily demands of disease control. It can lead to discontinuation of the regimen and the taking of medication, and thus become an obstacle in complying with the recommended treatment (14,15,16,17). Diabetes burnout, along with depression, anxiety and stress, is one of the major psychosocial complications of the disease (18,19).

Numerous studies have analyzed the association between diabetes and burnout (20). The high level of occupational stress is associated with low motivation to maintain healthy lifestyle habits, which leads to complications of the disease, respectively—a secondary increase in stress level. This can create a vicious cycle where the stress from both the disease and burnout continues to compound.

AIM

The aim of this article is to analyze the association between burnout and metabolic disorders.

MATERIALS AND METHODS

In order to achieve the goal, an analysis of the PubMed and Google Scholar databases using the following keywords: occupational stress, metabolic disorders, diabetes, biomarkers, was conducted.

RESULTS

Subjects with occupational burnout experience emotional exhaustion, which often develops into physical symptoms (1). Changes in sleep, exhaustion, and metabolic disorders are more often detected in these individuals (1).

Exposure to stress causes changes in brain neurocircuitry (for example, limbic forebrain, hypothalamus, and brainstem) (20) that affect vigilance to sensory stimuli, eliciting emotional responses of fear and avoidance. The physiological response to stress

is well characterized and consists of the activation of several neuroendocrine circuits, including the hypothalamic-pituitary-adrenal (HPA) axis, the sympathomedullary axis (SAM), the autonomic nervous system, and other systems (21,22).

Activation of the HPA axis leads to secretion of the adrenal glucocorticoid cortisol, which is one of the most widely appreciated effects of stress and is also often used as a stress biomarker (23). Cortisol can be measured in saliva, urine, and blood samples, but due to large diurnal variations, repeated measurements are required for meaningful evaluation (24). Previous studies indicated sustained activation of the HPA axis in patients with burnout (25). The data on the association of occupational burnout with high cortisol levels are conflicting (26) due to different measurement methods, but literature sources indicate that the cortisol level of people with a high level of occupational burnout measured in the morning after waking up is higher, compared to a control group (25).

Other major systems activated during stress include the SAM, which increases secretion of the catecholamine adrenaline (and other factors) from the adrenal medulla and sympathetic nervous system (SNS) and leads to secretion of norepinephrine (and other factors) from nerve endings and perfusion in the general circulation (21). They are difficult to measure, the results are conflicting, and rely more heavily on heart rate monitoring.

A total of 33 studies were identified that met the inclusion criteria for this review.

A cohort study of 3000 participants over more than 30 years through eight repeated biomedical examinations provides population-level evidence. Middle-aged people constantly exposed to high stress are more likely to be obese, hypertensive, and have fatty liver and diabetes than those exposed to low stress (23). One of the main pathways linking stress with metabolic disorders may be insulin resistance. In insulin resistance, metabolic tissues that are sensitive to insulin (e.g., skeletal muscle, liver, and white adipose tissue) become less sensitive to insulin, increasing the risk of diabetes and fatty liver disease (27). The stepwise progression from high stress to diabetes is presented in Fig. 1.

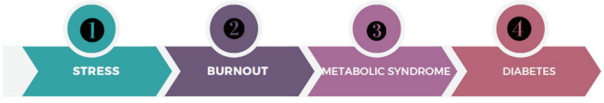


Fig. 1. Relationship between stress, occupational burnout, metabolic disorders, and diabetes.

Obesity is one of the leading causes of metabolic disorders. A link has been found between high levels of stress and visceral fat accumulation (28). Studies have proven a relationship between a high level of professional stress and a number of markers: elevated blood pressure (p=0.01), central obesity (p=0.03) (30), hyperglycemia (p = 0.03), hypertriglyceridemia p=0.03, low level of high-density lipoprotein (HDL) (p=0.02) (31). Psychological distress has been shown to be more strongly associated with a composite metabolic index (C-reactive protein, glycated hemoglobin, fibrinogen, triglycerides, total cholesterol, HDL cholesterol (inverse score), blood pressure, resting heart rate). A summary of the results for the relationship between burnout and biomarkers is presented in Fig. 2.



Fig. 2. Correlation between high level of occupational stress and indicators of metabolic disorders

A high level of occupational stress is associated with a low motivation for establishing healthy habits. A link between diabetes and burnout has been observed in the literature, both in patients and in their relatives. In this case, burnout is a product of the need to conduct activities to control the condition (31). Diabetes burnout is a mix of emotions and behaviors in which patients may feel mentally and physically exhausted from the daily commitment to self-care and experience anxiety about the disease (1). The

main guidelines related to the development of diabetes burnout are: feelings of mental exhaustion and physical fatigue from self-care related to the condition, neglecting the condition, withdrawal from care and support for the diabetic patient, feeling powerless to deal with diabetic burnout, individual features of the life-like situation, as a result of which the control is reduced and the condition worsens (31). The main reasons for the development of diabetic burnout are presented in Fig 3.

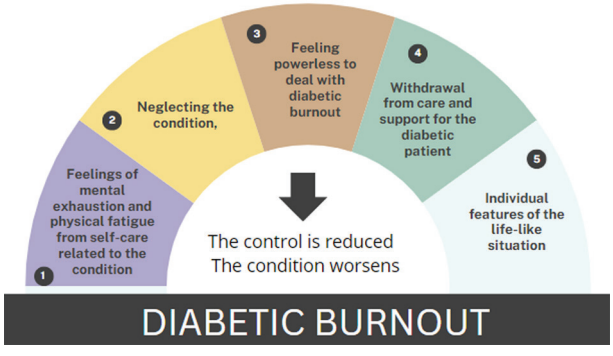


Fig. 3. The main guidelines related to the development of diabetes burnout.

In a randomized trial for patients with type 2 diabetes, stress management training was associated with a small but significant improvement in long-term glycemic control. Effective diagnosis and prevention of diabetes burnout is important to improve individualized diabetes care.

DISCUSSION

According to some studies, diabetes burnout can be viewed as a multidimensional concept, involving three interrelated dimensions: exhaustion, emotional withdrawal, and loss of control over one's illness. Different burnout profiles can thus be formed. On this basis, scales have been developed that facilitate the psychosocial assessment of diabetes (32).

Diabetes can negatively affect work life by reducing the likelihood of getting a job or creating some limitations in performing work duties. In people with this disease, lower professional efficiency, more frequent work leave, and psychological consequences, such as low satisfaction with quality of life and depressive symptoms, are observed. Research in this direction provides an opportunity for a better understanding of the disease and for maximally effective measures and counseling (33).

An important element is the survey of the overall job satisfaction of employees with diabetes. The obtained results are relevant both to those working with type 1 diabetes and to all medical personnel involved in the treatment of the disease (33). Awareness of the strong relationship between diabetes-related distress and burnout may prevent employees with high levels of burnout from using self-blame as a coping mechanism (34). The training that can be given to such people would motivate them to pay more attention to the first signs of burnout. Knowledge of the consequences of diabetes on work and quality of life may be critical to the career choices of adolescents with type 1 diabetes.

Modern approaches to working with people with diabetes focus primarily on the individual as the main actor in maintaining individual health, controlling the disease and preventing complications. A meta-analysis of self-efficacy educational programs in people with diabetes showed positive effects on HbA1C levels, on behavioral self-control, acquisition of new knowledge, and improvement in quality of life. However, most programs have short follow-up periods and do not include sufficient strategies to address emotional and physical problems (35). The limited use of strategies to improve the emotional state is a problem because the emotional aspect of diabetes-related distress is extremely important for the development of burnout (36).

Another approach, for example, a specific 12-week coaching program for working individuals with a chronic illness (ankylosing spondylitis, multiple sclerosis, nerve damage or neuropathy, type 1 and 2 diabetes) focuses on strengthening four central personal resources in the context of health, which are related to working (job self-efficacy, mental resources, core self-evaluations, and resilience). The goal is to reduce the work challenges of employees with a chronic illness, such as long absences due to illness, coming to work in a bad state of health, revealing the nature of the illness to colleagues, etc., and thus prevent additional losses of resources (35).

Organizations must purposefully support the health management efforts of their chronically ill employees. It is possible that employers are not even

informed about the worker's condition because diabetes under good control does not manifest itself with certain symptoms (36).

The management of an organization must not only know which employees are chronically ill, but also take their specific needs or concerns into account when making organizational decisions. This mainly concerns the allocation of tasks, shift work mode, conducting preventive examinations, etc. It is more efficient to implement flexible working hours, to specify the tasks according to the current state of health of the worker, to give the opportunity to work from home if necessary (36). Appropriate actions must be planned and implemented in close collaboration with chronically ill employees, which sometimes requires additional research into the specific needs of individuals.

Organizational support reduces stress, improves the mental and physical health of workers, increases trust in the organization, and contributes to the motivation to work.

CONCLUSION

Workplace stress and related professional burnout represent a significant risk for the occurrence of metabolic disorders. On the other hand, diabetic patients and their relatives often suffer from burnout caused by the need to carry out actions to control the condition. It is necessary to conduct measures for the prevention of professional burnout and the development of metabolic disorders. Diabetics also need support in managing the disease, which necessitates training among them to build skills to deal with the condition and the high level of chronic stress.

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