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Job stress models for predicting burnout syndrome: a review

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Abstract

In Europe, the Council Directive 89/391 for improvement of workers' safety and health has emphasized the importance of addressing all occupational risk factors, and hence also psychosocial and organizational risk factors. Nevertheless, the construct of "work-related stress" elaborated from EU-OSHA is not totally corresponding with the "psychosocial" risk, that is a broader category of risk, comprising various and different psychosocial risk factors. The term "burnout", without any binding definition, tries to integrate symptoms as well as cause of the burnout process. In Europe, the most important methods developed for the work related stress risk assessment are based on the Cox's transactional model of job stress. Nevertheless, there are more specific models for predicting burnout syndrome. This literature review provides an overview of job burnout, highlighting the most important models of job burnout, such as the Job Strain, the Effort/Reward Imbalance and the Job Demands-Resources models. The difference between these models and the Cox's model of job stress is explored.

Key words

- psychosocial risk factors
- risk assessment
- work-related stress
- burnout syndrome
- models of occupational stress

INTRODUCTION

Psycho-social risks and work-related stress are among the most challenging issues in the occupational health and safety field, impacting not exclusively on the well-being of individuals, but on the structure of organisations, businesses and on the national economies as a whole [1]. The impact of these factors has been detected on numerous work-related problems, such as the increased danger of heart diseases, gastrointestinal problems, anxiety, depression, absence, fatigue, accidents, substance misuse, musculoskeletal disorders, work-family conflict and the burnout syndrome [2]. In Europe, the Council Directive 89/391 for improvement of workers' safety and health has emphasized the importance of addressing all occupational risk factors, and hence also psychosocial and organizational risk factors [3]. The agreement signed between the European social partners in October 2004, known as the Framework Agreement on Work-Related Stress has defined the "work-related stress" as "a state that is accompanied by physical, psychological or social complaints or dysfunctions" [4]. Different methods were adopted by European countries in the attempt to assess theoretically and manage work-related stress. These methods were based on the Cox's research commissioned by EU-OSHA. Nevertheless, the definition of "work-related stress" elaborated by EU-OSHA (European Agency for Safety and Health at Work) is not completely equal to the broader "psychosocial risk", that includes different and emerging psychosocial risk factors, such as working hours, drug abuse, emotional demands, factors related to stress and burnout, violence and bullying [5-7]. While few studies on job burnout were produced based on Cox's analysis, researchers have tried to develop different theoretical models to improve our understanding of the relationship between the psychosocial work environment and job burnout, such as, for example, the Job Strain [8] and the Effort Reward Imbalance [9] models. The central aim of this article is to give a state-of-the art overview of current knowledge on the most important job stress models for predicting burnout syndrome. This review aims to provide to employers some suitable tools for the risk assessment of the psychosocial hazards related to burnout syndrome.

DISCUSSION

What is burnout syndrome?

Burnout is a stress-related phenomenon that has received widespread attention as an important problem for the affected individuals as well as for the society. Even though this subject has been analysed by numerous scientific publications, quality controlled studies on burnout syndrome are still lacking, and much research is still needed to establish the scientific basis of this entity. A general definition of burnout and its binding diagnostic criteria have not been established, while the potential casual factors are still subject of much controversy [10]. Bianchi enumerated four reasons why burnout should not become a nosological category. First, the foundation on which the burnout construct sits is

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tenuous. Second, burnout substantially overlaps with depression. Third, the three-dimensional structure of the burnout syndrome is unrealistic. Fourth, the mere act of defining burnout as job-related is not nosologically discriminant [11]. According to a well-known definition, burnout is a psychological syndrome described as a specific response to prolonged exposure to work-related stressors and has three components: exhaustion, depersonalization and reduced self-efficacy [12]. Exhaustion indicates the feelings of being overextended and depleted of emotional and physical resources; depersonalization (or cynism) refers to indifference or distant attitudes towards the service's clients (or the work in general); reduced self-efficacy (or personal accomplishment) refers to a feeling of incompetence or lack of achievement and productivity at work [13]. The outcomes of burnout in the workplace are generally linked to costly increases in turnover, absenteeism and reduced productivity for the individual and the organization, as well as negative effects on the intended receiver of the services [14, 15].

Differences between work related stress-strain and burnout

Even if "burnout" and "stress-strain" are both adverse responses to job stressors, they seem to have different antecedents, correlates and consequences. Identifying specific job-related stressors for burnout, such as predictors and outcomes (job dissatisfaction, desire to quit the job, physical and emotional symptoms and perceived performance level with implications), it is possible to differentiate the treatments between stress and burnout [10, 13, 16]. According to Maslach and Schaufeli [16], occupational "strain" and "burnout" are different consequences of "work related stress". Firstly, with respect to time, because of occupational strain is a generic term that refers to temporary adaptation at work, accompanied by mental and physical symptoms, while burnout is considered a chronic malfunctioning and the final stage in a breakdown during adaptation and therefore resulting from prolonged occupation stress. Secondly, they can be distinguished studying burnout like a process and not as a state. Finally, burnout includes the development of dysfunctional attitudes and behaviours towards the recipients of one's care of services and towards one's job and organisation. Burnout is a specific response to prolonged exposure to work-related stressors and for this reason it is often studied within the framework of stress research. Nevertheless, burnout can be distinguished conceptually from occupational stress strain, on the ground of its specific psychological construct and its antecedent and consequences related to work [17].

Cox's model of job stress

Psychosocial factors are assessed using psychological (as distinct from technical or physiological) models in which stress is viewed in terms of dynamic interactions between individuals and their work environment. Cox and Griffiths made a distinction between two types of psychological model of work stress: interactional or structural approaches and transactional or process models [2]. Interactional models focus on the structural characteristics of the stress process, *i.e.* which stressors are likely to lead to which outcomes in which populations, as in the Person-Environment Fit [18] and the Demand-Control-Support model [8]. The basis may also be transactional-focusing on the cognitive processes and emotional reactions governing person-environment interactions as in Effort-Reward Imbalance model developed by Siegrest [9], and the models devised by Lazarus and Folkman (1984) in the USA and Cox and Mackay (1981) in the UK [19].

Transactional views are more cognitive, and focus on the dynamic relationship that occurs between individuals and their environment in terms of mental and emotional processes [2, 19].

In the Eu-OSHA's report (2000), Cox's transactional model of work stress is closely related to the work of Lazarus and colleagues and many of the processes and stages in the two models are similar, however there are certain important differences in Cox's model, particularly a clarified structure and greater focus on occupational health and individual differences. Stress is conceptualised as being the psychological state that occurs when there is a mismatch between perceptions of the significance of a demand, and beliefs about one's ability to cope with it. The way that people perceive and appraise their work situation may drive their coping behavior, and this, in turn, feeds back in to how they perceive future work situation, including whether the demands of those situations match their (experience-defined) capacities for coping [2, 19]. Cox's research described work-related stress by a transactional model based on the workers' subjective perception of psycho-social hazards, related to both the content of and context to work [2]. In Europe, the most important methods developed for the work related stress risk assessment are based on the Cox's model [20] (see *Table 1*). These methods include the Management Standards for work-related stress of the Health and Safety Executive (HSE) (United Kingdom) [21], the SOBANE strategy (Belgium) [22], the START process (Germany) [23], and the INAIL/ISPESL model (Italy) [24, 25]. The latter combines the HSE Management Standards in the Italian context. INAIL adopted a methodological path inspired by the UK HSE MS model, for two main reasons: 1) the HSE approach and Indicator Tool have already been validated in the UK and Ireland on more than 6000 employees; 2) specific software has been prepared for data analysis [23]; the HSE have highlighted six management standards defining aspects of work that, if poorly managed, are associated with lower levels of health, productivity and well-being and with increased sickness absence: demands, control, support, relationship, role and change [26]. The HSE separated the stressors into two domains: Job Content and Job Context. Job Content includes Demands, Control and Support (both peer and managerial), while Job Context consists of Role, Relationships and Change [21]. The UK Health and Safety Executive's (HSE) Management Standards Indicator Tool (MSIT) appears to have utility in relation to health impacts but there are not studies relating it to burnout. According to a recent Ravalier's

Table 1
Models for the work-related stress risk assessment based on the EU-OSHA's report (2000)

Psychosocial hazards related to job "content"	Cox (EU-OSHA, 2000)	HSE method (United Kingdom)	INAIL/ISPESL method (Italy)	SOBANE method (Belgium)	START method (Germany)
Work environment and work equipment	yes	no	yes	no	yes
Workload/ workpace	yes	yes	yes	yes	yes
Work schedule	yes	yes	yes	yes	yes
Task design	yes	no	yes	yes	yes
Emotional demanding	no	no	no	yes	no
Psychosocial hazards related to job "context"	**Cox (EU-OSHA, 2000)**	**HSE**	**INAIL/ISPESL**	**SOBANE**	**START**
Organisational culture and function	yes	yes	yes	yes	yes
Role in organisation	yes	yes	yes	yes	yes
Career development	yes	no	yes	yes	yes
Decision latitude / Control	yes	yes	yes	yes	yes
Interpersonal relationships at work	yes	yes	yes	yes	yes
Home-work interface	yes	no	yes	yes	yes
Organisational change	yes	yes	yes	yes	no
Mobbing/Bullying/ Harassment	yes ("Violence at work")	no (yes: "Bullying and Harassment")	no (yes: "Bullying and Harassment")	no (yes: "Harassment")	no

research, MSIT has congruence with MBI-GS assessment of burnout, but this finding requires confirmation by a larger study [27].

Aetiology and risk factors of burnout syndrome

Beside the problem of a uniform and generally accepted definition, aetiological and pathogenetic aspects are the subjects of much controversy. However, according to Kaschka, the aetiology and the pathogenesis of burnout should be studied also to qualify the criteria by which it might be diagnosed, classified and treated [10]. Causal factors and development models can show what the term burnout comprises. Burnout first emerged as a social problem, not as a scholarly construct. In the mid-70s in the United States, during the "pioneering phase" of burnout conceptual development, the focus was on its clinical descriptions of burnout and on the social and individual causes. In the beginning burnout has been considered more of a personal problem than an organisational one [12, 28]. During the second phase, called "empirical phase", scholars developed standardized measures of burnout and the phenomenon was studied in other countries. In 1981, Maslach introduced a more comprehensive definition and the measurement most frequently used today, the Maslach Burnout Inventory. The empirical research on burnout has tended to focus more on job factors than on other types of variables, such as biographical or personal components [29, 30]. Finally, scholars have expanded the theoretical burnout framework to include organisational sources of stress. Looking at the theoretical framework, it can be seen how the factors impacting on the likelihood of burnout are multiple, including psychosocial work environment, socio-demographic/occupational characteristics, social relations outside work, lifestyle factors, and aspects of personality [14, 31]. Mark [32] summarized three category of risk factors for the teacher burnout:

- intra personal factors, emphasising mostly the psychology of the individual, where the focus is on the lack of balance between the caregiver's expectations and the actual reality;
- inter personal factors, where the focal point is the relationship between caregiver (the teacher), and the client (pupils and parents);
- organisational factors, based on the mismatch between worker and job organization.

Therefore the factors blamed for causing burnout are, as one might expect, multivarious.

Risk factors and theoretical models of the burnout syndrome

According to Hillert [33], the term burnout, without any binding definition, tries to integrate the symptoms (fatigue, emotional exhaustion, reduced personal accomplishment and distancing from clients) as well as the causes (job strain) of the process. Several theoretical approaches have been used to describe, explain, and predict burnout. In a review of twenty-five years of burnout research, Schaufeli and Buunk described fourteen theories regarding the individual, organizational and community levels. These theories have led to many relevant insights [29]. We report a brief summary of the most important models for predicting burnout syndrome providing the most used instruments for the evaluation of work-related psychosocial factors related to it (see *Table 2*).

Table 2
Models and instruments for the assessment of psychosocial risk factors related to job strain and/or burnout

Model	Instrument	Psychosocial risk factors assessed	Outcomes (burnout, strain or strain and burnout)
Cox's model (Cox *et al*., 2000) [2]	HSE Management Indicator Tool (UK) [21] INAIL/ISPESL (Italy) [24] START (Germany) [23] SOBANE (Belgium) [22]	Transaction on job content and job context work (see *Table 1*)	Strain
Job Strain model (Karasek, Johnson and Theorell, 1990) [8]	JCQ] (Karasek,1985) [104} JCQ version 2.0 (Karasek, 2006) [106] Brief Job Stress Questionnaire (Shimomitsu *et al*., 2000) [114]	Interaction between demand (psychological and physical job stressors, *e.g.* work overload, time pressure, unexpected tasks, responsibilities or job related conflict), control (job decision latitude: skill discretion and decision authority) and support (given by the management, supervisors, colleagues or subordinates)	Strain and burnout
Effort reward Imbalance model (Siegrest, 1996) [9]	ERI Questionnaire (Siegrest *et al*., 2004) [107]	Interaction between extrinsic effort (work load) and reward (money, esteem, career opportunities, and security). Transactionconcerns"intrinsic effort" (motivations).	Strain and burnout
Mediation model (Maslach and Leiter, 1997) [69]	Organizational Check up Survey (Leiter and Maslach, 2000) [68, 108]	Transaction on 6 job-related factors: work overload, lack of control, insufficient reward, breakdown of community, absence of fairness, value conflict.	burnout
Job Demand Resources model (Bakker and Demerouti, 2001) [88]	COPSOQ and COPSOQ 2 (Kristensen, 2005) [111] JDR Scale (Rothmann *et al*., 2006) [117]	Interaction between demand (*e.g.* role ambiguity, role conflict, role stress, stressful events, workload, and work pressure) and personal or job resources (*e.g.* regular feedback, working on a variety of tasks, autonomy, social support, high-quality relationship with their supervisors).	Strain and burnout
Demand Induced Strain Compensation model (De Jonge and Dormann, 2003) [89]	DISQ (De Jonge *et al*., 2004) [118]	Interaction between corresponding (cognitive, emotional and physical) job demand and job resources (*i.e.* job demands and job resources match job-related strain)	Strain and burnout

Intrapersonal risk factors

The psychodynamic [28], the cognitive-behaviour [34] and the existentialist [35] approaches are the most influential models based on the intra-personal risk factors. Freudenberger's approach to burnout [28] as a state of exhaustion resulting from excessively intense work and lack of concern for personal needs well reflects the clinical perspective. Freudenberger's description (1974) depicted idealistic young men and women (superachiviers) who reaped few rewards for their efforts, even while sacrificing their own health in the process. Edelwich and Brodsky [34] defined burnout as "a progressive loss of initial idealism, energy, and purpose experienced by people in the helping professions as a result of the conditions of their work". They identified four stages of burnout (or disillusionment): enthusiasm, stagnation, frustration, and apathy. Additionally, they identified the causes of burnout in the helping professions in, among the others, insufficient salary, long working hours, career dead-ends, lack of appreciation, powerlessness, and lack of training. Finally, the existentialist approach of Pines *et al.* [35] defined burnout as "sense of failure of highly motivated people". Pines's psychodynamic existential perspective is based on the assumption that people seek a sense of existential significance through their work and have psychodynamic reasons for their career choice. Therefore, the individual factors predisposing to burnout are the primary personality structure (*e.g.* idealism, perfectionism, timidity, insecurity, and emotional instability), the inadequate or lacking strategies to deal with stress, the disappointed expectations and negative experiences, and lifestyle (*e.g.* inadequate support due to a lack of social relationships/partnerships).

The relationship between socio-demographic variables and burnout

The socio-demographic characteristics with evidence of association with the burnout syndrome are age, gender, education, marital status and category of work. Research evidences how older married and female workers with low education status are the most vulnerable [36]. Nevertheless, according to Schaufeli *et al.* those who are unmarried (especially men) seem to be more prone to burnout compared with those who are married. Moreover, some studies have found that those with a higher

level of education report higher levels of burnout than less educated employees. Probably people with higher education have jobs with greater responsibilities and higher stress, or it may be that more highly educated people have higher expectations for their jobs [13].

With regard to age, previous research has found that there was a significant negative correlation between age and both emotional exhaustion and depersonalization as measured by the Maslach Burnout Inventory. Two theories are often advanced to account for this: those who suffered from emotional exhaustion or depersonalization at a younger age may have left the job either on grounds of ill-health or to seek alternative employment; older workers may have learned how better to pace themselves in their work in order to minimize opportunities for burnout [37, 38]. A meta-analysis of Brewer and Shapard [39] has indicated that there was a small negative correlation between employee age and emotional exhaustion, one of the components of burnout, at least for employees in some fields in the United States, and possibly a small negative correlation between years of experience in a field and emotional exhaustion. Reviews of Maslach [13] and Schaufeli [70], conducted mostly on human service work, have showed that burnout tends to decrease with age, whereas population studies on burnout have found the opposite. In a Swedish study, a high level of burnout was more common among aging workers than among middle aged workers, but not among young workers, suggesting a non-linear association between age and burnout [40]. Two nationally representative Finnish study have stated a positive association between age and level of burnout, but these studies were limited because they have excluded the youngest adults [41, 42]. *Globally,* population studies on burnout are scarce [40].

In Canada, Byrne has discovered that teacher's burnout may be influenced by gender, age, and type of student [43]. Also in Greece younger teachers have presented higher levels of emotional exhaustion and depersonalisation as compared to their older colleagues. This reaction was probably related with the young teachers' difficulty to activate the appropriate coping strategies in order to reduce the occupational stress imposed by the difficulties of their job [44]. Finally, in Anglican clergy in England and Wales, chronological age, and not years in ministry, was negatively correlated with the emotional exhaustion and depersonalization subscales of burnout [37].

With regard to gender, a recent meta-analysis about the relationship between gender and burnout challenged the commonly help belief that female employees are more likely to experience burnout than male employees, revealing instead that women are slightly more emotionally exhausted than men, while men are somewhat more depersonalized than women [45]. These findings are consistent with a survey carried out by the Finnish Institute of Occupational Health (1997). According to this study, even if both males and females showed high incidence of serious burnout syndrome and milder symptoms had been suffered by slightly more than half of the male and female respondents, the totals number of burnout cases among women was slightly higher than among men on the sum of the three symptoms of burnout because of an higher score of emotional exhaustion [46]. According to Schaufeli and Enzmann (1998) the difference of higher cynicisms for men and exhaustion for women is related to stereotypical gender roles or natural inclinations among both sexes [45]. Specifically, women are better equipped for human relations and for sharing their negative emotions, while men tend to suppress their emotional impulses in order to live up to their roles, thereby making them more inclined to adopt cynical attitudes as a means for coping with stress. Moreover, emotional exhaustion might affect more women than men because of the combined demands of home and work [47]. For example, Greek female teachers reported higher levels of burnout that generally stem from the negative conditions in the classroom and the students' behaviour, as well as work-family interface [43]. According to Schaufeli and Greenglass [48], the possible gender difference in burnout may reflect differences in roles and occupations. Therefore, the demographic variable of sex is not a strong predictor of burnout [47]. Finally, according to Purvanova, gender differences did not vary significantly in male-typed *vs* female-typed occupations [45].

With regard to occupational variable, at the beginning Maslach described the burnout as a phenomenon related to the "helping" professions. Subsequently, burnout was also studied in "high touch" professions. For this reason, occupational burnout is typically and particularly known within human service professions. In fact, professions with high levels of burnout include health care and social workers, teachers, lawyers, customer service representatives, and police officers [49]. One reason why burnout is so prevalent within the health care workers is due in part, to the high-stress work environment and emotional demands of the job [50]. Specifically, literature reviews about the relationship between burnout and category of work were carried out in health care workers [15, 51], particularly physicians [52], nurses [53], emergency nurses [54], emergency physicians [55], mental health workers [56], cancer professionals [57], dialysis staff [58] and intensive care operators [59]. Moreover, reviews were carried out in medical students [60], elderly care staff [61], and correctional officers [62]. Finally, a recent new conceptualization of burnout, according to the Mediation and JDR models, ridefines its three original dimensions to take account of the job itself, the purpose being to consider burnout levels in relation not only to working with recipients as in the helping professions but also to a person's work in general. Depersonalization (negative or inappropriate attitudes toward recipients) turn into cynism toward the organization. So, burnout includes both "staff burnout" and "job burnout".

Interpersonal risk factors

The social-psychological perspective of Maslach and Jackson [12] took a more research-oriented approach to the topic, attempting to identify work environmental conditions that conduct to burnout. It emphasized how role-related stress caused by emotional demands,

could lead to the employee's mental fatigue, mechanistic treatment of clients and perceptions of a diminished ability to succeed at his or her job. Whereas Freudenberger saw burnout as an increased effort on the part of the professional worker [28], Maslach viewed it as leading to the worker's withdrawal and the tendency to treat clients in a detached, dehumanized manner. In the beginning, Maslach traced out the burnout in helping and high touch professions, basing on the theory that individual, socio-cultural and cultural factors combined with the high emotional demands (client related stressor) could influence the interaction between employees and clients [31]. Emotion demands (or emotion work) is defined as the job requirement to display specifically demanded emotions. People-oriented professional work demands a great deal of emotional, cognitive and physical energy. These overloading and conflicting demands may lead to emotional exhaustion, mental weariness and physical fatigue [12, 31]. As defined by Zapf *et al*., emotion work occurs when employees are required by the employer to regulate their emotions in order to display appropriate emotions to the client. As emotion work determines the quality of social interaction-related occupations, the exposure to high emotional demands relates to various negative stress-related outcomes, such as emotional exhaustion and burnout [63]. While the occurrence of burnout syndrome could be identified in a wide range of occupations, it is particularly recurring in care-giving professionals, such as clinicians, psychologists, social workers, nurses and others. Psychological explanations assume that the function of caring, advising, healing or protecting of such professions, together with the demand of empathy, is determining for the burnout's incidence [64]. According to Cherniss's model [65] burnout syndrome is the consequence of a complex interaction among individual, socio-cultural and organisational factors. In contrast to Maslach, Cherniss argued that the three dimensions of burnout are mechanisms used to cope to stressful, frustrating, or monotonous work. The focus of Cherniss'analysis is learning how organizations and socio-cultural environments can affect a person's response to work. In a social-historical perspective, Sarason [66] emphasised the impact of society, rather the individual or the organisation, on the development of burnout. Sarason pointed to the current social values and the philosophy of individualism as major catalysts in this regard [66]. Buunk and Schaufeli (1992) made an attempt to link burnout with social exchange processes at the interpersonal level. They followed the theory of Maslach (1982) that burnout is a syndrome rooted in the emotionally demanding interpersonal relationship between caregiver and recipient. According to the Maslach's theory, a lack of reciprocity between human service professionals and recipient, depleting emotional resources of the former, lead to burnout. Subsequently, Schaufeli (1996) argued that similar social exchange processes observed in interpersonal relationships govern the relationship of the employee with his or her organization. This "dual-exchange model" suggests that a combination of individual and workplace interventions is most effective in reducing burnout and enhancing committment. At the same time, a vast array of research demonstrated that burnout was positively related to particular job characteristics such as workload, work-family conflict, role problems, lack of autonomy, lack of social support from colleagues and supervisors [67]. So, researchers studied organizational stressors related to burnout, in two pathways: the Mediation model in USA, and the Job Strain and the Effort-Reward Imbalance models (two of most influential theoretical occupational stress model) in Europe.

Organizational risk factors

Burnout is defined as a chronic stress reaction and in practice, the roots of burnout theories are mainly in general stress theories, which emphasize the interaction between work characteristics and the employee. One of the most influential general theories has been the Person Environment - Fit Theory according to which, an imbalance between demands and opportunities in the working environment and skills and expectations of the employee is the most important antecedent of the process of stress and deteriorating health [18].

The Mediation model

The Mediation model of burnout follows the theory of Maslach and others, which is also based on the P-E-fit theory [16, 18]. According to the new concept of "job burnout", burnout can be described in every profession, even outside the helping professions and it develops as a result of mismatches between professionals and their job contexts in several worklife areas (*i.e.* workload, control, rewards, community, fairness and values) [68]. Specifically, a discrepancy is perceived when the process of establishing a psychological contract with one's job leaves critical issues unresolved, or when a change in working relationship feel unacceptable to the worker. According to this definition, Leiter and Maslach [69] proposed the Mediation model, which postulates that the greater the degree ow work job mismatches, the greater the likelihood of burnout. The six areas connected with the three dimensions of burnout are interrelated. For example, a mismatch in excessive overload may be linked to a mismatch in lack of control over the job. The work-life areas are: 1) work overload that occurs when job demands exceed human limits; 2) lack of control that occurs when people have little control over the work they do; 3) insufficient reward (a lack of appropriate rewards for the work people do); 4) breakdown of community that occurs when people lose a sense of positive connection with others in the workplace; 5) absence of fairness that occurs when there is a lack of a system of justice and fair procedures, which maintain mutual respect in the workplace; 6) value conflict that occurs when there is a mismatch between the requirements of the job and people's personal principles.

The Job Strain and the Effort-Reward Imbalance *models*

Several other influential theories have been applied in burnout research. The most important theories used have been the Job Strain (or the Demand-Control) model [8] and the Effort-Reward Imbalance (ERI)

model [9]. The main assumption of the Job Strain model is that a combination of a situation of high demands, low control and low social support is viewed as stressful for a worker. The Job Strain model distinguishes itself from other work stress models by both its simplicity and the extent to which it has gained a paradigmatic function in work and health research. Numerous studies have applied this model to different physical and psychological health outcomes, such as cardiovascular disease, depression, and burnout [70, 71]. Another effective model for the study of Burnout is the Siegrest's ERI model. The core concept within ERI is reciprocity: mismatch between effort at work and suitable rewards will lead to stressful experience. Reward is identified as money, esteem, career opportunities, and security, while effort is proposed to have two components: intrinsic effort, from the personal motivations, or external pressures, such as workload (similar to the concept of the job demands in the Job Strain model). Whereas the ERI uses extrinsic and intrinsic factors, the Job Strain model is only concerned with extrinsic factors. According to ERI model, burnout process is triggered when the worker feels that his or her efforts are disproportionate to the gratification achieved, and consequently is no longer able to justify or cope with further investment of effort [9, 19, 72].

A comparison between Job Strain and ERI models

The Job Strain model was the most used predictive job stress model in the burnout's research. However, in a recent review (2010) Hausser *et al.* have studied the validity of the JDC/JDCS model with respect to emotional exhaustion. With regard to the 35 studies applying the JDC model, additive effects of demands and control were partially or fully supported, but regarding the 23 studies in which it was applied to the JDCS model, only weak evidence was obtained for the buffer hypothesis [73]. Moreover, support for additive effects was lower in longitudinal studies compared to cross-sectional studies for both models. Nevertheless, as highlighted by a recent systematic review [74], six longitudinal studies of adequate methodological quality have investigated, using the Karasek's model, the relationship between several psychosocial working conditions (divided in three categories: work organisation, work task and social conditions) and the development of emotional exhaustion/burnout. This research found a relatively consistent association between unfavourable psychosocial working conditions (high workload, high quantitative, mental or emotional demands, low social support) and emotional exhaustion. Particularly, this study indicated that high demands or increased job strain (measured with the JCQ) are major risk factors for emotional exhaustion. Whilst from the results it cannot be concluded that increased job strain is the main risk factor for diminished emotional exhaustion, this hypothesis was not frequently examined. The main strengths of this systematic review were the exclusion of cross-sectional studies to best avoid reverse causality (cause-and-effect bias) and the inclusion of high methodological quality studies. Many studies were also carried out using the ERI model. Unlike the DCM, the ERI model introduced a personal component in the model as well. In fact, overcommitment is defined as a set of attitudes, behaviors, and emotions may moderating the association between effort-reward imbalance and employee wellbeing. A meta-analysis of high quality prospective studies of workers' perception of their work environment provides robust consistent evidence that combinations of high demands and low decision latitude, and high efforts and low rewards, are prospective risk factors for common mental health disorders [75]. The two model complement each other in that the JDC model focuses on the task characteristics and social aspect of the workplace while the ERI model relates to the stressful experience and personal cognitive pattern of dealing with work. However, both DCS and ERI were relatively simple, static and, according to the changing nature of the job, did not take into consideration all possible working environment variables. So, factors of both models were included in several studies. Therefore, research examining the JDC and ERI models as complementary analytical tools, showed that both models were significantly associated with burnout; even if the ERI model appears to do slightly but significantly better compared to Karasek's model, the best prediction of health-related outcomes comes from combining the two. In fact, who were exposed to both, job strain and ERI models, had an additionally increased risk for developing burnout. Particularly, it was found in surgery clinicians [76], nurses [77], physicians [78], civil servants [79], judges, procurators [80], financial workers, lawyers [81], hospital nurses [82], police officers [83], bank employees [84], teachers [85], traffic police officers, community health staff and workers from other different job sectors [86, 87]. Subsequently, researchers tried to amended the DCS model to include emotional demands comprising both emotional (*e.g.* dealing with clients) and psychological demands (*e.g.*, workload or quantitative demands) in human service employees. For this reason, according to the Job Strain model, among the burnout researchers, *new models* have been developed, such as the Job Demands-Resources model [88] and the Demand-Induced Strain Compensation Model [89].

The Job Demands-Resource model

The Job Demands-Resources (JD-R) model is a heuristic and parsimonious model that specifies how burnout and work engagement may be produced by two specific sets of working conditions that can be found in every organizational context: job demands and job resources. While Karasek's (1979) influential Demands-Control (DC) model – at least in its original form – uses a rather restricted definition of job demands that are mainly quantitative in nature (*e.g.*, work overload and time pressure), the JD-R model expands this view by including those demanding characteristics of the working environment that are unique to the organization under study [90]. Generally, job demands are aspect of the job that require sustained physical, emotional, or cognitive effort, for example role ambiguity, role conflict, role stress, stressful events, workload, emotional labour, and work pressure: they are important predictors of out-

comes such as exhaustion, psychosomatic health complaints and repetitive strain injury. Job resources are those physical, psychological, social, or organizational aspects of the job that help to either achieve workload, reduce job demands, or stimulate personal growth, learning and development and are generally the most important predictors of work enjoyment, motivation, and work engagement. Job demands and resources can interact with two possible ways. Job resources such as social support, performance feedback, autonomy, opportunities for development can mitigate the impact of job demands (work pressure, emotional demands, etc.) on strain, including burnout. Alternatively, job demands can amplify the impact of job resources on motivation and engagement. Thus, research has shown that job resources become salient and have the strongest positive impact on work engagement when job demands are high, and how employees who have many job resources available can cope better with daily job demands [91, 92]. The JDR model is currently tested in Spain, Greece, Italy, Norway, Sweden, Finland, Germany, Belgium, South Africa, China, and Australia [93]. Nevertheless, there are still several important unresolved issues regarding the JD-R, including the model's epistemological status, the definition of and distinction between demands and resources, the incorporation of personal resources, the distinction between the health impairment and the motivational processes, the issue of reciprocal causation, and the model's applicability beyond the individual level [94]. The JD-R model assumes that whereas every occupation may have its own specific working characteristics, these characteristics can be classified in two general categories (*i.e.* job demands and job resources), thus constituting an overarching model that may be applied to various occupational settings, irrespective of the particular demands and resources involved. The central assumption of the JD-R model is that job strain develops – irrespective of the type of job or occupation – when (certain) job demands are high and when (certain) job resources are limited. In contrast, work engagement is most likely when job resources are high (also in the face of high job demands). This implies that the JD-R model can be used as a tool for human resource management [95].

Conservation of Resources theory

The final proposition of the JD-R model is that job resources particularly influence motivation or work engagement when job demands are high. In the early 1990's, scholars adapted Conservation of Resources (COR) theory to understand the process of burnout and stress in organizational settings. Since then, COR theory has developed as one of the leading theories in burnout and the one that meta-analysis of extant studies suggests best fits the data [96]. The value of COR theory was further reinforced when research interest shifted towards work engagement and vigor as the positive counterparts of burnout and away from deficit and pathology models. COR theory is a motivational theory that rests firstly on the basic tenet that individuals strive to obtain, retain, foster, and protect resources. A basic principle of COR theory is that stress ensues when people experience or anticipate resource loss, or fail to gain resources after significant resource investment. Following this principle, we see the process of resource loss, gain, and protection as primary in explaining burnout and work engagement. Resources are those personal energies and characteristics, objects and conditions that are valued by individuals or that serve as means for the attainment of other objects, personal characteristics, conditions or energies. Examples of resources include social support, job enhancement opportunities, degree of participation in decision making, being psychologically well or having an optimistic personality, level of autonomy, and established behaviour outcome contingencies [97]. The central element of burnout and work engagement is the affective component that results from processes that center on peoples' intrinsic energetic resources, more specifically emotional robustness, cognitive agility and physical vigor. Seen this way, burnout is the end state of a long-term process of resource loss that gradually develops over time depleting energetic resources, whereas engagement is the resultant of the inverted process of real or anticipated resource gain enhancing energetic resources [98].

The Demand Induced Strain Compensation model

In light of the conceptual and practical limitations of the Job Strain and ERI models, and their apparent unsuitability for measuring job demands and job resources associated with today service work, De Jonge developed a new model of job stress that tries to unify principles that are common to both models. De Jonge's and Dormann's [89] Demand Induced Strain Compensation model (DISC model) created more cohesive theoretical model of job stress. The central premise of this model is that there are various types of demands and resources (multidimensionality principle), and that each of these is matched (triple match principle), so that emotional demands at work are most likely to be compensated for by emotional resources and produce a particular type of emotional or affective outcome. This compensation principle implies that the negative effects of job demands can be counteracted through the availability and activation of job resources. According to De Jonge and Dormann, resources from within the same domain as the job demands (*i.e.*, cognitive, emotional, or physical) will produce a greater likelihood of counteracting the negative job demands. Balance is the final principle of the DISC Model: it theorises that the optimal conditions for active learning, growth, and creativity exist where a balanced mixture of (high) job demands and corresponding job resources occurs [99].

Other theories and models

According to the Socially Induced Burnout model of Bakker *et al.* burnout can be socially induced. On the basis of emotional contagion theory (Hatfield *et al.*, 1954) and social comparison theory (Festinger, 1954), employees may receive symptoms of burnout in their colleagues and automatically take on these symptoms [95]. Exhaustion component of burnout is a likely candidate for unconscious contagion or induction, while cynism and professional efficacy seem the most likely candi-

dates for conscious transmission. So, the team burnout shows a direct relationship with individual employees' burnout, but there is also an indirect influence on individual employees' burnout through its influence on their working conditions (workload and job autonomy).

Self-determination theory has been advocated as a promising theoretical lens through which to examine the potential antecedents of burnout. When these needs are satisfied, humans are expected to experience optimal wellbeing. Conversely, the thwarting of needs is thought to lead to expressions of ill-being. More specifically, research showed that employees' basic psychological needs play a mediating role not only between job resources and exhaustion (and engagement), but also between job demands and emotional exhaustion [93, 100]. Finally, according the Circumplex Model of Russel, the dimensions of pleasure and arousal can be treated as orthogonal to each other; four quadrants result from the combination of the axis of pleasure and the axis of activation level: anxiety or stress strain (high activation and low pleasure), enthusiasm (high activation and high pleasure), depression or burnout (low activation and low pleasure), and comfort (low activation and high pleasure) [102, 103].

TOOLS FOR THE ASSESSMENT OF PSYCHOSOCIAL RISK FACTORS RELATED TO BURNOUT SYNDROME

The Job Content Questionnaire

The Job Content Questionnaire (JCQ) is a questionnaire-based instrument designed to measure the content of a respondent's work tasks in a general manner which is applicable to all jobs and jobholders. The best-known scales, decision latitude, psychological demands, and social support, are used to measure the high-demand/low-control/low-support model of job strain development. The demand/control model predicts, first, stress-related risk and, second, active-passive behavioral correlates of jobs. Other aspects of work demands are assessed as well: physical demands and job insecurity. The JCQ has been translated into over 22 languages. An active users' group supports usage of the JCQ, and an international board of researchers decides on policy and development issues [104]. The Swedish Demand-Control-Support Questionnaire (DCSQ), which is a modified version of Karasek's Job Content Questionnaire (JCQ), being shorter and easier to use than the more comprehensive JCQ, represents an important alternative, particularly if respondent burden and data-collection costs need to be minimized [105]. According to Karasek, JCQ and JCQ-like questionnaires, such as the Swedish version of the demand Control Questionnaire (DCQ) were valid and generally reliable [106].

The Effort-Reward Imbalance Questionnaire

Effort-Reward Imbalance Questionnaire was developed at University of Düsseldorf, primarily in cardiovascular health studies. This instrument measures 3 unidimensional scales: effort (6 items on quantitative/qualitative overload, overall increase, physical load); reward (11 on financial, esteem, career, security, etc.); overcommittment (6 or 29 items). There are 2 versions, one short (23 items) and one long (46 items) [107]. The relationship between effort and rewards can be operationalized in different ways including as a ratio of efforts divided by rewards multiplied by a correction factor, (where zero indicates low efforts and high rewards, and values beyond (indicating high efforts not met by rewards) and as a multiplicative interaction term [19].

The Organizational Check Up Survey

In contrast with the interaction of demand and control predicted by the Karasek model, Leiter and Maslach [108] proposed a series of main effects such that insufficient control and excessive workload will each aggravate burnout and sufficient control and manageable workload will promote engagement with work. An important characteristic of this model is the concept of burnout as a continuum in the relationship people establish with their jobs. In contrast to a syndrome of Exhaustion, Implication/Cynicism and Inefficacy, Leiter and Maslach proposed a positive state of Energy, Involvement, and Efficacy [69]. They defined engagement on the same dimensions as burnout, but placed it on the positive end of these three qualities. Thus, engagement comprises a state of high energy, strong involvement, and a sense of efficacy [109]. For this reason, Leiter and Maslach [68] created a questionnaire Areas of Work-life Scale (AWS), which measures both the opposing dimensions of burnout – Energy, Implication and Efficacy – and the areas of work that could contribute positively or negatively to these three dimensions. AWS is not a tool to measure burnout individually (although it can be used in this manner), as the authors consider burnout to be a problem that the individual cannot cope with alone. The questionnaire regards the organization as a subject for evaluation and intervention, since organizational aspects of work-life (overload, control, reward, community feeling, fairness, and values) contribute to employees feeling energetic and involved in their tasks, or the contrary. The Organizational Checkup Survey (OCS) is a comprehensive package comprising four scales: the Maslach Burnout Inventory-General Survey (MBI-GS), the Areas of Worklife Scale, the Changes and Management scales. The Areas of Worklife Scale (AWS) is a self-report survey assessing six working life domains: workload (six items), which examines the amount of work to be done in a given time; control (three items) refers to the opportunity to make choices and decisions, to solve problems and to contribute to the fulfilment of responsibilities; reward (four items) relates to (both financial and social) recognition for contributions on the job; community (five items) describes the quality of the organization's social environment; fairness (six items) relates to the perceived extent to which the organization has consistent and equitable rules for everyone working there; values (five items) refers to the degree of correspondence between employees' personal and professional values and the organization's principles and practices. Items are scored on a five-point Likert scale ranging from one (strongly disagree) to five (strongly agree). The Evaluation of Changes is a self-rated scale assessing perceived changes in the organization over the previous year; it consists of ten items scored on a five-

point Likert scale ranging from one (strongly negative change) to five (strongly positive change). The Management Areas is a self-rated scale composed of three dimensions: leadership (six items); skills development (four items); and work-group cohesion (three items). Each item is scored on a five-point Likert scale ranging from one (strongly disagree) to five (strongly agree).

The Copenhagen Psychosocial Questionnaire

The Copenhagen Psychosocial Questionnaire (COPSOQ) is a relatively new established, broad and comprehensive questionnaire. It was based on results and analyses of the Danish Psychosocial Work Environment Study with the aim of assessing and improving the psychosocial work environment [110]. The COPSOQ consists of questionnaires at three levels with different lengths and complexity, but based on the same analyses and basic theoretical assumptions. This tool is a concept aiming at describing a large number of relevant factors within the field of psychosocial work environment, health, well-being, and personality; it includes five different demand dimensions, including emotional and cognitive demands [111]. The COPSOQ questionnaire combines the Job Strain, the ERI and the JD-R theories and reveals advantages in use being "theory-based but not attached to one theory" [111]. He further states that for reasons of content validity such a tool include dimensions related to work tasks, the organization of work, interpersonal relations at work, cooperation and leadership and cover potential work stressors, as well as resources [111]. This comprehensive instrument not only measures specifically defined potentially health-hazardous constellations at work but has the objective of assessing all relevant aspects of the psychosocial work environment [112]. The second version of the Copenhagen Psychosocial Questionnaire (COPSOQ II) was designed to measure a wide range of psychosocial factors, but the instrument was particularly unique in that it measures emotional demands, predictability, possibilities for development, quality of leadership, social community at work and trust (as a part of workplace social capital), justice and respect, and family-work (im) balance [113].

The Brief Job Stress Questionnaire

The Brief Job Stress Questionnaire (BJSQ) [114], is based on the Job Strain model and can be used to evaluate 2 job stress dimensions (job demand and job control) and social support from supervisors and co-workers. The BJSQ also includes support from family/friends, but this doesn't focus on job factors. The BJSQ has been widely used in Japan for practical occupational health evaluation and occupational health research [115]. The New BJSQ scales can be used to assess psychosocial work environment and related outcomes to prevent stress at work and promote positive mental health at work. Newly added scales can be used to assess psychological work environment with a broader range of theoretical models of job stress, such as ERI and organizational justice, and a boarder range of outcomes, such as work engagement, perceived workplace social capital, and workplace harassment. The New BJSQ followed the tradition of the current BJSQ, assessing psychosocial work environment and outcomes simultaneously, which is also used in the PRIMA-EF approach [116].

The Job Demands Resources Scale

Rothmann *et al.* [117] developed a questionnaire to measure job demands and resources; the psychometric properties of this instrument were investigated in different South African organizations.

The Demand Induced Compensation Questionnaire

To measure job demands and job resources, a new, user free, instrument, called "Demand Induced Compensation Questionnaire" (DISQ), was developed by De Jonge *et al.* [118]. "DISQ" is available in seven different languages and in both short and long form.

The General Nordic Questionnaire

A tool for the assessment of organizational risk factors related to emotional exhaustion and other health outcomes is the General Nordic Questionnaire for Psychological and Social Factors at Work (QPS Nordic). It was developed in the late 1990s in a Nordic context from a request of the Nordic Council of Ministers to be a measure of psychological and social factors in the work environment. The items were classified into three levels, task level, social and organizational level, as well as individual level. Specifically, emotional exhaustion correlated with low commitment to organization, high quantitative job demands, and role conflicts, while a good social climate had a mitigating effect on the level of reported exhaustion [119].

CONCLUSION

In Europe, the most important methods elaborated for the "work-related stress" risk assessment are based on the Cox's transactional job stress model. So far, few studies on job burnout according to the HSE Management Standard or INAIL/ISPESL methods have been developed [20, 27]. On the other side, several models such as the Mediation, the Job Strain and the ERI models, were theorized or used in literature for explaining burnout phenomenon. According to literature on burnout syndrome, instruments such as the OCS, the Job Content Questionnaire and the ERI questionnaire might be used by employers for the risk assessment process of the psychosocial risk factors related to burnout syndrome. Nevertheless, the recent JD-R model seem to be the more comprehensive, and, therefore, the more suitable to explain, globally, the risk factors related to burnout. This model offers a more comprehensive vision of the phenomenon and allows us to discover the problems underlying burnout syndrome. The Job Demand Resources (JD-R) model [88, 94] has been elaborated from Job strain and ERI models, taking psychosocial factors into the categories of job demand and job resources. It is considered a promising alternative framework that can be applied to a broad spectrum of occupational settings irrespective of the particular demands and resources involved. Unlike the ERI and Job strain model, the JD-R model is flexibile

because it can be tailored to the specific needs of an organisation, given any specific situation. Moreover it considers both negative (burnout, strain, impairment) and positive (engagement, productivity) outcomes and process (*i.e.*, the health impairment and motivational processes). The JD-R model has been offered as a generic framework to overcome the limited focus of the Job Strain and ERI models. The flexibility of the JD-R is attractive to practitioners because it can be applied to a wide range of occupations, and be used to improve employee well being and performance [120-122]. Most studies on the JD-R model have been restricted to work characteristics and, as a result, the role of employees' personal resources, which can be important determinants of their adaptation to work environments has been neglected. However, Xanthopoulou *et al.* have investigated the role of personal resources, as antecedents of job demands and resources in the JD-R model and their respective outcomes using insights from conservation of resources (COR) theory [96]. Personal resources were self-efficacy, organizational-based self-esteem and optimism, all of which have been recognized by Hobfoll as fundamental components of individual adaptability. Xanthopoulou *et al.* focusing on a general dimension, which refers to individuals' perceptions of their ability to meet demands in a broad array of contexts, found that personal resources play a significant role in the JD-R model since, together with job demands and job resources, and they contribute in explaining variance in exhaustion and work engagement [123]. In this way, JDR is a comprehensive and holistic model can explore the relationship between work-related stressors that leads to a better understanding of how to work towards reducing the risk of burnout syndrome. According to the Job Demand Resources Model, the JCQ and the ERI scales, the COPSOQ, the Brief Job Stress Questionnaire and the JD-R Scale can be used for the evaluation of the psychosocial risk factors related to burnout and work engagement. Specifically, the OCS and the COPSOQ are instruments currently available by employers for evaluation of psychosocial risk factors related to burnout at individual, group and/or organizational levels. Finally, the JD-R model can be considered the starting point to define new scales for the evaluation of the psychosocial risk factors related to burnout in several occupational settings. In conclusion, this paper asks some questions about the work-related stress risk assessment and indicates need for further activity in this field.

Conflict of interest statement

There are no potential conflicts of interest or any financial or personal relationships with other people or organizations that could inappropriately bias conduct and findings of this study.

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