

## Stress and well-being at work: a literature review

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**Abstract** *The study presents empirical evidence of the personal and contextual variables that protect against the negative effects of stress on workers' well-being and health. A systematic review of the literature of the last eleven years (2006 to 2016) was carried out in the Ebsco, LILACS, SciELO, Google Scholar, and PubMed databases, and in six Annual Reviews journals. Fifty national and international articles related to stress and well-being were analyzed. The results show that work-related factors, personal resources such as resilience, self-efficacy, emotional competencies, psychological detachment, work-life interface, and group-level factors have effects on well-being. The perceived social support of peers and managers, alongside autonomy at work, attenuate the negative impact of stress on well-being. It ends with suggestions for future studies to test relationships between variables that have not yet been explored and to deepen the understanding of the relationships between stress and well-being at work.*

**Key words** *Occupational Stress, Working Conditions, Job Satisfaction, Review*

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## Introduction

Stress is one of the concepts most studied and mentioned in psychology, since it is manifested in everyday life as a factor that can put the psychological and physical health of people at risk<sup>1-4</sup>. The three main perspectives for approaches to stress are: i) one that emphasizes the physiological responses and reactions of the individual to the stressors; ii) one that seeks to investigate the stress factors in the environment that provoke damage to the well-being and health of individuals; and iii) the psychological/cognitive one that focuses on the relationship between the individual and the environment, that is, how the person evaluates and perceives the stressor event<sup>5</sup>. This last approach is cited by most of the articles studied<sup>6-9</sup>.

According to Lazarus<sup>10</sup>, the way we evaluate an event determines how we react emotionally. Thus, work-related stress is influenced by the perception that the subject has of the demands in the work environment and his/her capacity to face them. In other words, in order for the work-related stress process to occur, workers have to evaluate the situation and the demands of the environment as stressors, and see themselves as lacking the resources to deal with them, generating reactions with negative effects on their well-being. Considering the complexity of the stress phenomenon, permeated by a series of psychological, social, and biological processes that involve human-environmental interaction, recent studies inspired by the Positive Psychology movement have been trying to understand how these processes can interfere in the health and well-being of people<sup>11-13</sup>.

The movement known as Positive Psychology<sup>14</sup> emphasizes the positive aspects of human experience, and seeks to understand the qualities that help individuals develop their potential, maintain their physical and psychological health, and their personal well-being. This movement has also spread among the scholars of organizations, giving rise to a variety of studies developed in the work context, emphasizing the role of traits, positive affective states, behaviors, and virtues that predispose individuals to experience well-being at work (WBW)<sup>15</sup>. Work-related well-being can be said to encompass a diversity of experiences that include positive affective states (e.g., enthusiasm), low levels of negative affective states (e.g., anxiety), good psychosomatic health and cognitive states such as aspirations and judgments about job satisfaction<sup>16</sup>.

In addition to stress factors stemming from the workplace, personal resources such as self-esteem and emotional stability, and the work-home interface seem to influence the fluctuations in indicators of well-being<sup>17</sup>. The experience of stress at work has been consistently associated with negative results for employees, measured by a range of well-being indicators, both psychological and physiological<sup>18-20</sup>. However, in confronting events perceived as stressors, these individuals react differently. Although many studies conclude that there is a negative association between stress and well-being at work<sup>1,18-22</sup>, there has been a growing number of studies that seek to explain under what conditions stressors may not adversely affect WBW<sup>17,23-25</sup>. Various studies highlight the important role of resilience and the strategies used to control and deal with one's emotions (emotional self-regulation), and to cope with stressful situations, which can be effective in reducing stress and improving well-being in various contexts<sup>26-30</sup>.

The systematic review presented in this article sought to explore and understand the relationships that exist between stress and well-being at work, attempting to find evidence of which personal and/or environmental variables have protective effects for the well-being of workers, with positive impacts on their physical, mental, and social health. The study contributes to an overall view of the state of the art in this field of research, a critical assessment of the results obtained, as well as generating inputs to support proposals for improving well-being at work (WBW) and reducing stress in organizations. It also discusses the relevant theoretical and practical implications based on the results found and suggests directions for future research in the field.

## Methodological Procedures

### Data collection and analysis procedure

The first step of searching for articles was carried out during June and July 2016, in the following databases: Ebsco, Google Scholar, Lilacs (Latin American and Caribbean Literature on Health Sciences), SciELO (Scientific Electronic Library Online), and PubMed (National Library of Medicine). A search was also done on six Annual Reviews journals (Annual Review of Environment and Resources, Law and Social Science, Neuroscience, Organizational Psychology, Psychology, Public Health). The databases were

chosen because they cover a large and diversified volume of scientific publications representative of the diverse fields of knowledge, since stress is a well-studied construct. The Annual Reviews are publications dedicated to literature review articles, which would help identify the evolution of the findings on stress, well-being, and work. The key words used for the article search were: “stress”, “wellbeing”, “job”, and “work” in English, aiming to cover the national [Brazilian] and international literature. The database searches were configured to retrieve the words in the “title”, “summary”, and “keywords” fields. The Boolean operator “and” was used to request the selected words to appear in those fields. It was determined that the databases should present the articles published from 2006 to 2016, covering the last 11 years, a period with an intensification of studies on well-being in the context of work, driven by the Positive Psychology movement. In the PubMed database, specifically, we selected only review and meta-analysis articles in order to filter the initial search, which resulted in 3,996 titles. Through these procedures, a total of 675 references were obtained.

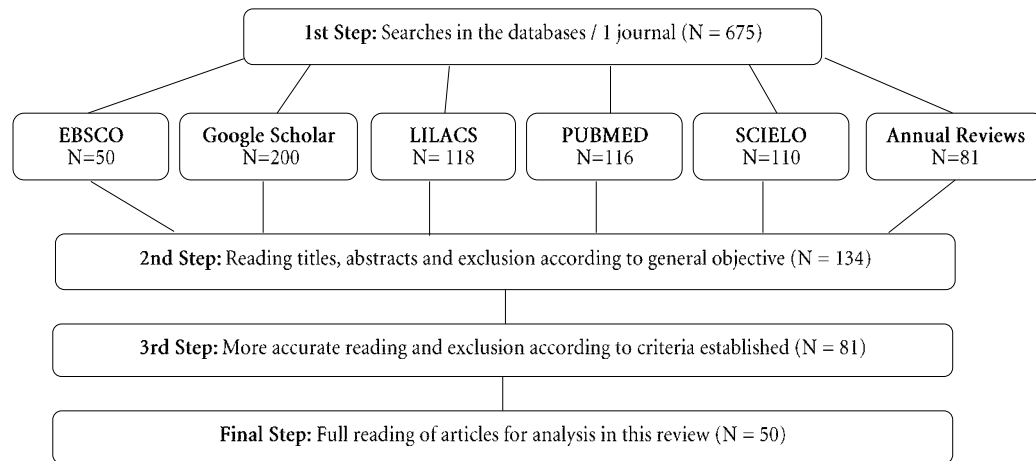
In the second step, the titles and abstracts of these works were read, excluding those that did not correspond to the general objective of this review, as well as theses, books, and editorials, with 134 thus remaining. In the third step, during the process of a more detailed reading of these articles, 81 of them were discarded, considering the following exclusion criteria: (a) *type of study*: theoretical articles; (b) *focus of the study*: those dealing only with burnout syndrome (antecedents, predictors, and prevalence), with the reverse effect between stressor and well-being/tension, those to validate instruments or evaluate intervention programs for stress reduction; (c) *measurement*: articles in which well-being was measured only by job satisfaction; (d) *sample type*: consisting of university students, elderly, or young people not included in the labor market. In the final step, 50 articles were selected that met the following inclusion criteria: (a) *type of study*: empirical scientific review or meta-analysis articles; (b) *year of publication*: between 2006 and 2016; (c) *focus of the study*: dealing with the relations between stressors/stress and well-being at work/of workers, including moderating and mediating variables or not; (d) *measurement*: assessing or measuring stress and/or stress factors at work, and positive and negative aspects of well-being/health (physical, psychological, social, work-related, among others); (e) *sample type*:

workers from various categories; (f) *publication languages*: Portuguese, English, or Spanish. Figure 1 illustrates these procedures performed to select the material.

For the systematization and analysis of the material, all the articles that met the inclusion criteria were read in full, and their basic information summarized, such as authorship, year of publication, methodological outline, study focus, study variables (independent variable - IV, dependent variable - DV, moderating and mediating variables), and conclusions (correlations between variables, main predictors, etc.). Predictive variables are those capable of predicting effects on another variable, while the moderating variables are those that can affect the direction and strength of the relationship between the IV, or antecedent, and the DV, or consequent variable. The mediator variable is one that, when introduced into the model, makes the relationship between an IV and a DV no longer significant, since the relation between them is better explained by the mediator<sup>31</sup>. The data were collected in tables, separating the review/meta-analysis studies from the empirical studies. The suggestions from the studies in general, regarding future research and applicability of results in organizations, were also summarized and integrated.

## Results

The articles analyzed are presented in four tables, in order to facilitate visualization and understanding of the data. Charts 1 and 2 present a summary of the review and meta-analysis articles (authorship/year of publication, type of review and sample, IV and DV, other variables, and conclusions). Chart 1 lists eleven studies published between 2011 and 2016, and Chart 2 presents four studies published between 2006 and 2010, totaling fifteen (15). Charts 3 and 4 present the summary of the empirical articles (authorship/year of publication, type of study and participants, focus of the study, and conclusions). Chart 3 lists nineteen studies published between 2011 and 2016, and Chart 4 presents sixteen studies between 2006 and 2010, totaling thirty-five (35). The main positive and negative predictors of well-being at work (WBW), the environmental and individual moderators, the mediators, the positive predictors of tension, physical and psychological symptoms, and health problems are highlighted in the conclusions. The studies are arranged in descending order of publication



**Figure 1.** Steps of the article selection process.

Source: The authors.

year, with the most recent ones first, organized in alphabetical order by author name.

Considering the totality of the selected articles, it is observed that from the review and meta-analysis studies (Chart 1 and 2), eleven were published between 2011 and 2016 (73.3%), and only four pertain to the previous period (2006 to 2010), indicating a considerable increase in scientific production in the last five years. As to the empirical studies (Chart 3 and 4), nineteen appear in this more recent period (54.3%).

As for the geographical location where the empirical studies were carried out, eight were from Brazil and the rest from other countries: Portugal (3), South Africa (3), two or more countries (3), Australia (2), Iran (2), Argentina (1), Chile (1), China (1), Spain (1), USA (1), Japan (1), Norway (1), Netherlands (1), Pakistan (1), United Kingdom (1), Switzerland (1), Taiwan (1), Turkey (1), Venezuela (1). The participants in these studies were workers from various sectors, including mainly health professionals (45%), teachers (20%), workers in general (11%), and others (24%): public employees, military personnel, banking and industry professionals. Regarding the review and meta-analysis studies, the origins are quite diverse since they consider many studies from different countries, with most being samples of workers in general (80%). Two

studies were conducted with health professionals (13.3%) and only one with industry employees (6.7%).

As for the method, Charts 3 and 4 clearly indicate the prevalence of a quantitative approach using self-reported scales in the empirical studies, corresponding to 82.8% (N = 29). Only six qualitative studies were found. A significant difference was observed regarding the inclusion of moderators and mediators, being considered in 60% of the review and meta-analysis studies and in only 31% of the quantitative empirical studies.

#### **Review and Meta-analysis Studies: predictors**

The main negative predictors of well-being at work (WBW) are stressors and lack of resources at work: pressure and overload<sup>17,22,23,25</sup>, high demands and low control<sup>18,20</sup>, monotony and low decision-making power<sup>20</sup>, negative social interactions and lack of social support<sup>17,20</sup>, and negative affective events at work<sup>23</sup>. Individual factors such as low psychological detachment during time off<sup>25</sup>, negative emotions and dysfunctional emotion regulation (ER)<sup>32</sup>, and work-family conflict<sup>17,23</sup> were cited less often.

As positive predictors of WBW, personal resources such as self-esteem, active coping, opti-

Chart 1. Summary of review and meta-analysis studies (published between 2011 and 2016).

Authorship/ Publication Year	Type of Review and Sample	IV and DV	Other variables	Conclusions
Bragard et al. <sup>59</sup> /2015	Empirical, cross-sectional studies with emergency physicians.	IV: Occupational stress. DV: Burnout and Quality of Work Life – QWL (satisfaction and well-being at work).		<ul style="list-style-type: none"> <li>- Burnout predictors: stressors such as high demands and lack of resources at work (low control, lack of support from supervisors/coworkers, and lack of training).</li> <li>- Relevant factor that minimized the impact of stressors at work, improving QWL: perception of the work as rewarding.</li> </ul>
Ilies et al. <sup>23</sup> /2015	Theoretical and empirical studies, cross-sectional and longitudinal, and meta-analyses. Workers.	IV: WBW antecedents (stressors, affective events at work, personal factors, work-family balance). DV: Effects on WBW (stress reactions, job satisfaction, psychological well-being - PWB).	Moderators: control at work, social support, other resources at work, positive affects, psychobiological recovery process.	<ul style="list-style-type: none"> <li>- Predictors (-) of WBW: psychosocial stressors at work, negative affective events at work, and the experience of work-family conflict.</li> <li>- Predictors (+) of WBW: positive events at work.</li> <li>- Moderators that minimize the effects (-) of the demands and stressors on WBW: control at work, social support and other resources at work, positive affects, and psychobiological recovery process (psychological detachment from work, experiences of relaxation, control, and self-mastery).</li> </ul>
Sonnentag <sup>17</sup> /2015	Empirical studies, cross-sectional and longitudinal. Workers.	IV: Work factors (stressors, resources, and interpersonal relations at work); Personal resources; Work-home interface. DV: Well-being at work (WBW).	Moderators: Environment: positive events, autonomy, support at work, climate of security. Individuals: emotional stability, self-regulation strategies.	<ul style="list-style-type: none"> <li>- Predictors (-) of WBW: stressors at work, negative social interactions and lack of social support at work, work-home conflict.</li> <li>- Predictors (+) of WBW: resources and social support at work, personal resources (self-esteem, coping, optimism, self-efficacy).</li> <li>- Moderators of the environment that mitigate the effects of stressors on WBW: events (+), autonomy, perception of support and climate of psychological security at work.</li> <li>- Individual moderators that mitigate the stressors: emotional stability and use of self-regulation strategies.</li> </ul>
Sonnentag and Fritz <sup>25</sup> /2015	Empirical studies, cross-sectional and longitudinal. Workers.	IV: Stressors at work. DV: Psychological reactions (affects, tension, and health symptoms); Well-being/WB (satisfaction with life and engagement at work).	Psychological detachment from work during time off / leave from work.	<ul style="list-style-type: none"> <li>- Predictors (-) of WBW: stressors at work (pressure and overload) and &gt; level of psychological detachment.</li> <li>- Moderator that mitigates the impact of stressors on WBW: &gt; psychological detachment from work.</li> </ul>
Ford et al. <sup>7</sup> /2014	Meta-analysis of longitudinal empirical studies. Workers.	IV: Occupational stressor. DV: Occupational tension (psychological and physiological).		<ul style="list-style-type: none"> <li>- Predictors (+) of tension over time: chronic stressors that accumulate through systematic exposure at work.</li> <li>- Factors having impact on &gt; tension: high demands and difficulty in disconnecting from work during free time (psychological detachment).</li> </ul>

it continues

Chart 1. Summary of review and meta-analysis studies (published between 2011 and 2016).

Authorship/ Publication Year	Type of Review and Sample	IV and DV	Other variables	Conclusions
Schaufeli and Taris <sup>4</sup> /2014	Empirical cross-sectional and longitudinal studies with workers.	Model 1 IV: Demands at work. DV: Tension and results (-) on health. Model 2 IV: Resources at work. DV: Well-being (engagement).	Moderator: Personal resources (self-esteem, self-efficacy, control, and resilience).	- Model 1: demands predict tension and health problems in the long term. - Moderator that reduces effects of demands on tension: personal resources. - Model 2: resources at work predict WB and good performance at work. - Moderator that increases effects of resources on engagement at work: personal resources (also a partial mediator in the relationship).
Ganster and Rosen <sup>18</sup> /2013	Empirical cross-sectional and longitudinal studies with workers.	IV: Psychosocial stressors at work. DV: Well-being as physical and psychological health (tertiary effects on health).	Primary effects: stress hormones, tension, anxiety, fatigue, and insomnia. Secondary effects: high BP, cholesterol.	- Predictors (-) of WB: high demands and low control. - Effects of stressors: anxiety and tension, high blood pressure and cholesterol, cardiovascular disease, type 2 diabetes, and depression. - Moderator that mitigates the effects (-) of demands on WB:> control.
Scheibe and Zacher <sup>9</sup> /2013	Empirical cross-sectional and longitudinal studies. Workers.	IV: Affective events at work. DV: Tension, stress, and well-being (WB).	Moderator: Age.	- Predictor (+) of WB:> age and better emotion regulation. - Moderator that mitigates the impact of stress: age.
Silva et al. <sup>22</sup> /2013	Theoretical and empirical studies with nurses.	IV: Stressors at work (overload, conflicts, and accumulation of functions). DV: WB/Health (physical/psychological).		- Predictors (-) of WB: overload of work and accumulation of functions (managerial and assistance activities). - Effects of stressors: physical and mental exhaustion and psychosomatic disorders.
Lang et al. <sup>19</sup> /2012	Meta-analysis of empirical longitudinal studies. Industry Workers.	IV: Psychosocial stressors at work. DV: Physical health (musculoskeletal symptoms).		- Predictors (+) of musculoskeletal symptoms: monotonous work, high demands and low control over work, high level of stress, low supervisor support, and job insecurity.
Lawrence et al. <sup>32</sup> /2011	Theoretical and empirical studies with workers.	IV: Affective events at work and emotional experience. DV: Short- and long-term effects on Well-being/WB (physical and psychological health, attitudes, social relationships).	Strategies for emotion regulation (ER) and emotional expression, Emotional intelligence (EI), Organizational rules of expression.	- Short and long term predictors (+) of WB: positive emotional experience, functional ER, and emotional expression. - Long-term predictors (-) of WB: experience of negative emotions and habitual dysfunctional ER (suppression). - Moderator between experience and ER that mitigates the negative impacts of affective events on the results of WB: EI. - Moderators between experience and emotional expression, with impact (+) on relationships: EI and rules of expression.

IV: Independent Variable; DV: Dependent Variable; (+): positive; (-): negative.

Source: The authors.

**Chart 2.** Summary of review and meta-analysis studies (published between 2006 and 2010).

Authorship/ Publication Year	Type of Review and Sample	IV and DV	Other variables	Conclusions
Häusser et al. <sup>11</sup> /2010	Cross-sectional and longitudinal empirical studies with workers.	IV: Model 1 - Demand-control at work. IV: Model 2 - Demand-control-support at work. DV: Psychological well-being.	Model 1 - Moderator: control. Model 2 - Moderator: social support and control.	- Both models have good empirical support. - Moderator in Model 1:> Control attenuates the negative impact of job demands on PWB (psychological well-being). - Moderators in Model 2: social support and control mitigate the impact (-) of high demands on PWB.
Meyer and Maltin <sup>33</sup> /2010	Theoretical and empirical studies with workers.	IV: Stressors at work; and Commitment. DV: Tension and Well-being (physical and psychological).	Moderators: Affective (AC), Normative (NC), and Continuance (CC) Commitment; Motivational state.	- Predictor (+) of WB: AC. - Predictor (+) of tension: CC; - Predictor (-) of tension: AC. - Moderators that either reduce or exacerbate the effect (-) of stressors: type of commitment and motivational state.
Nieuwenhuijsen et al. <sup>34</sup> /2010	Meta-analysis of empirical studies with workers.	IV: Psychosocial risk factors at work. DV: Mental disorders related to stress.		- Predictors (+) of mental disorders: high demands and low control at work, low support from coworkers and supervisors, low organizational justice, and high effort-reward imbalance.
Laranjeira <sup>20</sup> /2009	Empirical studies with workers.	IV: Organizational factors of stress and well-being (WB). DV: Effects of stress and well-being (physical, emotional).		- Predictors (+) of stress and (-) of WB: monotony, lack of control, impossibility of making decisions, and lack of support from peers and leadership. - Predictors (+) of WB: social cohesion and collective efficacy.

IV: Independent Variable; DV: Dependent Variable; (+): positive; (-): negative.

Source: The authors.

mism and self-efficacy<sup>17</sup>, affective commitment at work<sup>33</sup>, the experience of positive emotions, and functional emotion regulation (ER)<sup>32</sup> are highlighted. Resources at work<sup>4</sup>, which refer to the physical, psychological, social, or organizational aspects of the work environment that are aimed at achieving goals and reducing psychological costs, such as social support at work<sup>17</sup>, and positive affective events at work<sup>23</sup>, were pointed out. Group factors as social cohesion and collective efficacy were cited in only one study<sup>20</sup>.

As predictors of tension, symptoms, and physical/psychological disorders, chronic stressors, such as high demands, lack of resources and social support<sup>20,32,34</sup>, and low psychological detachment from work<sup>1</sup> stand out (Chart 1).

### Review and Meta-analysis Studies: moderators

Environmental and individual moderators that ease the negative impact of stressors on workers' well-being deserve attention. The principal moderators of the environment are the resources at work, such as control and social support at work<sup>11,18,23</sup>, positive events at work, worker autonomy, perception of organizational support, and the climate of security<sup>17</sup>.

Whereas personal resources, in addition to reducing the negative repercussion of stressors, increase the positive effect of organizational resources on well-being at work (WBW)<sup>4</sup>. These are: emotional stability and self-regulation strat-

Chart 3. Summary of empirical studies (published between 2011 and 2016).

Authorship/ Publication Year	Type of Study and Participants	Focus of Study	Conclusions
Malik and Noreen <sup>12</sup> /2015	Correlational and cross-sectional. University and school teachers. Pakistan.	Investigar o suporte organizacional percebido (SOP) como moderador da relação entre estresse ocupacional e bem-estar afetivo no trabalho (BEA).	- Moderator that exacerbates the impact (-) of stress on WB: low perception of organizational support.
Mihăilă <sup>3</sup> /2015	Correlational and cross-sectional. Workers selected via LinkedIn, employed at the moment.	Study the relationship between stress at work and organizational behavior (well-being, job satisfaction, turnover, and frustration at work).	- Predictor (-) of WB and satisfaction at work: stress at work. - Predictor (+) of frustration at work and desire to leave the company: stress.
Semmer et al. <sup>37</sup> /2015	Correlational, cross-sectional and longitudinal. Swiss Workers.	Describe the concept of illegitimate (unnecessary) tasks and test their association with Well-being (WB)/Tension.	- Predictors (-) of WB: illegitimate tasks - Predictors (+) of tension after 2 months: illegitimate tasks.
Carvalho et al. <sup>42</sup> /2014	Case study with hospital health professionals from Portugal.	Understand individual perceptions, mental representations, and attributes related to managing emotions and stress at work.	- The better the management of emotions, the better the control, ER, and < emotional stress. - The > the level of consciousness of emotional states and the > the quality support and development of appropriate activities, the > the well-being and QWL.
Millán de Lange et al. <sup>24</sup> /2014	Correlational and cross-sectional. University teachers from Venezuela.	Study emotional intelligence (EI) and the willingness to flow at work as protective factors against work stress and as promoters of PWB.	- Protective factors against work stress and predictors of PWB (psychological well-being): EI and willingness to flow at work.
Gomes et al. <sup>44</sup> /2013	Correlational and cross-sectional. Nurses from hospitals in Portugal.	Identify sources of stress, coping strategies, and relation with the general health of nurses in oncology services.	- Stressors: related to organizational aspects and working conditions. - Coping strategies: focus on problem solving and WB improvement. - Correlation (-) between general health and avoidance coping strategies.
Naransamy and Van Der Westhuizen <sup>37</sup> /2013	Correlational and cross-sectional. Clinical lab. workers in South Africa.	Investigate whether WBW consists of 4 factors: occupational stress, burnout, work engagement, and job satisfaction.	- The results support the four-factor WBW model. - Correlation factors (-) with WBW: occupational stress and burnout. - Correlation factors (+) with WBW: satisfaction and engagement in the work.
Rahimnia et al. <sup>39</sup> /2013	Correlational and cross-sectional Hospital Nurses from Iran	Test a model in which psychological capital (self-efficacy, optimism, and resilience), constructive and destructive emotions, stress, anxiety, and depression are antecedents of WB.	-> psychological capital: > constructive emotions, < destructive emotions and > WB. - Predictor (+) of WB: constructive emotions. - Predictor (-) of WB: destructive emotions. - The reduction of destructive emotions has > effect in increasing WB.
Sanches and Santos <sup>7</sup> /2013	Case study with university professors from the health area in Brazil.	Analyze the situations that generate occupational stress (stressors), the symptoms, and coping strategies used.	- Stressors: <i>unprepared students, work overload, context, concern about student learning and institutional deadlines.</i> - Coping strategies: <i>self-control, social support, problem solving, and re-evaluation.</i>

it continues



Chart 3. Summary of empirical studies (published between 2011 and 2016).

Authorship/ Publication Year	Type of Study and Participants	Focus of Study	Conclusions
Bell et al. <sup>21</sup> /2012	Correlational and cross-sectional. Academics from Australian Universities.	Investigate the relationship between perceived stress at work (threat and pressure), work-life interface, and well-being/malaise.	- Predictor (-) of WB and (+) malaise: threat stress. - Predictor of work-life conflicts: threat and pressure stress at work.
Bell et al. <sup>36</sup> /2012	Correlational and cross-sectional. Academics from Australian Universities.	Investigate the influence of spirituality at work (SAW) on WB and stress, and the moderating effect of SAW on the relationship between stress and WB/ malaise.	- SAW: correlation (+) with BE and (-) with malaise and stress. - There was no moderation of spirituality between stress and well-being. - Predictor (-) of WB; stress of psychological threat at work.
Niven et al. <sup>34</sup> /2012	Correlational and cross-sectional. Social workers, therapists, and ambulance personnel from the UK.	To investigate whether emotion regulation (ER) can mitigate the negative effects of exposure to aggression in the workplace on tension.	- Moderator that attenuated the aggression-tension relationship in the workplace during interactions within the organization: re-evaluation strategy. - Moderators that exacerbate the effects (-) of aggression in the workplace during interactions outside the organization: ER strategies (reassessment and suppression).
Serafim et al. <sup>48</sup> /2012	Case study with public servants in the Executive Branch, Brazil.	Analyze the psychosocial risk factors at work (PRFW) and the relationships with illness developed at work.	- Predictor of illness and incapacity for work: continuous exposure to PRFW. - PRFW should be considered in evaluating cases of illness and occupational disability, and in promoting occupational health.
Caran et al. <sup>35</sup> /2011	Correlational and cross-sectional. Brazilian Public University Teachers	Identify the existence of Psychosocial Occupational Risks (POR) in the work environment of university professors, and effects on health.	- Predictors of deteriorating health and mental disorders: continuous exposure to POR (perceived by 87% of teachers). - Principle changes: stress, anxiety, and insomnia.
Guido et al. <sup>61</sup> /2011	Correlational and cross-sectional. Nurses at a university hospital in Brazil	Identify stressors, stress level, general health status, and forms of coping used by nurses in the work environment.	- The form of coping most used: problem solving. - The < stress level was associated with good/fair health and > use of problem-focused coping strategies.
Kinman and Grant <sup>41</sup> /2011	Correlational and cross-sectional. Social workers in England, Africa, and the Caribbean.	Investigate emotional and social competencies as predictors of resilience and their role between emotional intelligence (EI) and distress/PWB.	- Factor protecting against stress and predictor of PWB: emotional competencies. - Predictors of resilience: emotional (EI and empathy) and social competencies. - Resilience was a predictor (-) of psychological distress and mediator between EI and PWB.
Lee et al. <sup>36</sup> /2011	Correlational and cross-sectional. Hospital nurses in Taiwan.	Analyze the relationships between stress at work, coping strategies, and promotion of a healthy lifestyle.	- > Stress was associated with > use of coping and < with healthy lifestyle promotion. - < stress was associated with > coping for control and support and > healthy lifestyle (health responsibility and keeping updated).
Mosadeghrad et al. <sup>47</sup> /2011	Correlational and cross-sectional. Hospital Employees in Iran.	Understand the relationships between stress at work, QWL, and the impact on turnover intentions.	- Stress has a relationship (-) with QWL (Quality of Work Life). - Predictors of stress: stressors, policies, relationships, and the work environment.
Rothmann and Malan <sup>7</sup> /2011	Correlational and cross-sectional. Hospital Pharmacists, South Africa.	Investigate whether stress at work and coping strategies predict WBW (burnout/engagement).	- Predictor (+) of WBW: > problem-focused coping and < avoidance coping. - Predictor (-) of WBW: high demands, lack of resources, and avoidance coping.

Source: The authors.

Chart 4. Summary of empirical studies (published between 2006 and 2010).

Authorship/ Publication Year	Type of Study and Participants	Focus of Study	Conclusions
Sadir et al. <sup>51</sup> /2010	Comparison between groups, cross-sectional. Clients of Brazilian psychological clinic.	Verify if the variables of gender, position, age, and marital status interact on the levels of stress and QoL of professionals beginning stress treatment.	- Groups with > stress: professionals between 40 and 49 years, women and married. - QoL (Quality of Life) factor most compromised in all professionals: health. - Damage in the social and affective factor: > for managers and < for self-employed.
Santos and Cardoso <sup>8</sup> /2010	Correlational and cross-sectional. Brazilian mental health workers.	Evaluate the stress, coping strategies and QoL of mental health service professionals.	- The > the stress index, the > the use of escape-avoidance strategies. - The < the stress index, the > the quality of life (QoL).
Wadsworth et al. <sup>38</sup> /2010	Correlational and cross-sectional. Workers from England and Wales.	Compare the impact of the presence/absence of work factors and association with mental health and WB.	- > job demands had > impact on stress. - < social support had > impact (-) on WB.
Afonso and Gomes <sup>43</sup> /2009	Correlational and cross-sectional. Military staff, Portuguese National Guard.	Evaluate their work stress and analyze relationships with proactive coping, organizational commitment, personal satisfaction, and professional fulfillment.	- > stress and < personal and professional satisfaction, > impact (-) on career. - > Proactive coping and > commitment predict > personal/professional satisfaction. - The > the use of confrontation strategies, the > the exhaustion of the military personnel.
Astudillo Diaz et al. <sup>52</sup> /2009	Case study with health professionals from hospitals in Chile.	Investigate protective factors against stress present in the work environment, as perceived by the health personnel.	- Stress protectors: well-defined roles, committed leadership, chance to break the routine, quality of resources, teamwork, pleasant environment, and good relationships. Factors (+) that are useful for guiding actions to promote health at work.
Chen et al. <sup>1</sup> /2009	Correlational and cross-sectional. Offshore oil workers, China.	Explore the relationship between occupational stress and mental health of Chinese workers.	- Predictor (-) of mental health: occupational stress. - The < the managerial support, the > the risk to mental health.
Goto et al. <sup>38</sup> /2009	Case study with Brazilian automobile industry professionals.	Investigate the factors perceived as stressors at work, the coping strategies, and perceived WB (satisfaction with life and work).	- Stressors: tight deadlines and excessive volume of work, low autonomy. - Coping strategies: Handling stress through the control of career and work content, engaging in recreational activities outside the company.
Paris and Omar <sup>40</sup> /2008	Correlational and cross-sectional. Doctors and nurses from Argentina.	Identify stressors and coping strategies used by health professionals; and explore the relationships between stress, well-being, and job satisfaction.	- Stressors: overload, lack of support, and perceived injustice at work. - < Stress > use of problem solving/distancing strategies, > satisfaction and WB. - > Stress > use of maladaptive strategies, < satisfaction and WB.
Shimazu and Schaufel <sup>45</sup> /2007	Correlational and longitudinal. Machine construction company workers in Japan.	Examine the effects of problem-focused coping and of distraction on well-being (responses to stress; performance at work).	- > Use of problem-focused coping is associated with < stress in individuals with high distraction, and > stress in those who had low distraction. - There was a short-term effect (+) of problem-focused coping on WB and performance

it continues

Chart 4. Summary of empirical studies (published between 2006 and 2010).

Authorship/ Publication Year	Type of Study and Participants	Focus of Study	Conclusions
Uncu et al. <sup>57</sup> /2007	Correlational and cross-sectional. Attending physicians in Turkey.	Analyze the relationships between affective well-being at work and stress, anxiety, and depression.	- Affective WB: correlation (-) with stress, depression, and anxiety. - Affections (-) at work correlate with stress, anxiety, and depression.
Fonseca and Soares <sup>49</sup> /2006	Case study with Brazilian nurses.	Analyze the relationships between affective well-being at work and stress, anxiety, and depression.	- Stressors: interpersonal relationships, environmental conditions, lack of resources at work. They are seen as negative predictors of health and WBW. - Coping: praying, physical activities, warmth of home and in the work itself. - Health problems: hypertension and migraines.
Fortes-Ferreira et al. <sup>26</sup> /2006	Correlational and cross-sectional. Bank employees in Spain.	Analyze the roles of direct-action coping and palliative coping in the relationship between stressors and PWB (distress, complaints, and satisfaction at work).	- Predictor (+) of PWB: direct-action or problem-focused coping. - Predictor (+) of distress: palliative or avoidance coping. - Moderator that exacerbated the effect of stressors on complaints: palliative coping.
Gelsema et al. <sup>50</sup> /2006	Correlational and longitudinal. University Hospital Nurses in the Netherlands.	Analyze the influence of working conditions (demands, resources, decisions, rewards) on health and WB (satisfaction, emotional exhaustion, distress, and physical complaints), and the reverse effect.	- Predictors (+) of satisfaction at work: social support of supervisor, rewards, and control over work. - Predictors (+) of emotional exhaustion: time pressure, increased demands at work and physical requirements. There is a reverse effect.
Jackson et al. <sup>46</sup> /2006	Correlational and cross-sectional. Educators from South Africa.	Assess the internal validity and consistency of constructs in a well-being at work (WBW) model and test a structural model of their relationships.	- Predictors (+) of WBW: work resources (support and career opportunities). - Engagement mediated the relationship between work resources and organizational commitment. Burnout mediated the relationship between demands and illness.
Karlson et al. <sup>27</sup> /2006	Correlational and cross-sectional. War Veterans of Norway.	Explore the effects of stress, trauma, coping, and growth orientation on subjective well-being (SWB).	- The effect of stress was positively mediated by a problem-focused coping process, associated with a growth component, leading to the improvement of SWB. - Stress was negatively mediated by an avoidance coping process and a distress component, leading to the worsening of SWB
McCalister et al. <sup>53</sup> /2006	Correlational and cross-sectional. US technology workers.	Test the relationship between resilience and social support and the effects on stress and satisfaction at work, and the influence of negative affects on the relationship between stress and satisfaction at work.	- Resiliency resources, support from supervisor and coworkers has a protective function that minimizes stress and improves satisfaction at work. - The > the negative affects, the < the job satisfaction. - When the other variables were included as predictors in the model, there was no correlation between negative affects and job satisfaction.

Source: The authors.

egies<sup>17</sup>, emotional intelligence (IE)<sup>32</sup>, greater psychological detachment<sup>25</sup>, and age. Elderly adults are more effective in avoiding and regulating negative affects resulting from work events, reducing tension<sup>9</sup> (Chart 2).

### **Empirical Studies: predictors**

As negative predictors that affect work well-being (WBW), here we also see mainly stressors and lack of resources at work: psychosocial occupational risks<sup>35</sup>, perceived stress at work<sup>2</sup>, occupational stress<sup>1</sup>, stress from psychological threat<sup>21,36</sup>, high demands and lack of resources<sup>6</sup>, illegitimate tasks<sup>37</sup> (seen as unnecessary), and lack of social support<sup>38</sup>. Reduced managerial support was associated with a greater risk to mental health in the study by Chen et al.<sup>1</sup>. Factors related to affection and its regulation were pointed out in fewer number, such as destructive emotions<sup>39</sup>, maladaptive stress coping strategies<sup>40</sup>, and avoidance coping<sup>6</sup>.

Notable positive predictors of WBW include personal resources such as high psychological capital (self-efficacy, optimism, and resilience) and constructive emotions<sup>39</sup>, emotional competencies<sup>41</sup>, increased awareness and management of emotions<sup>42</sup>, emotional intelligence and willingness to flow in work<sup>24</sup>, in addition to proactive problem-focused coping strategies<sup>6,26,40,43-45</sup>. Work resources such as organizational support, growth, and career opportunities proved to be WBW promoters in the research by Jackson et al.<sup>46</sup>.

The main predictors of malaise, tension, psychological stress, and other physical and psychological disorders were: psychosocial risk factors at work, that is, characteristics and conditions at work that act as stressors<sup>35,47,48</sup>, and notable among these are illegitimate tasks<sup>37</sup>, threat stress<sup>21</sup>, time and deadline pressure, work overload, and high demands and low resources<sup>7,49,50</sup>. The consequences of constant exposure to stressors can be detrimental to well-being, damaging workers' health<sup>7,35,49,51</sup> (Chart 3).

### **Empirical Studies: moderators and mediators**

Some authors investigated the protective factors against stress (moderators), that is, those personal or environmental characteristics, or the perception held about them, that can reduce the negative effects that the stress process can have on health and well-being, including: well-defined roles, leadership committed to the job and to the

employees, possibility of breaking the routine, quality of resources, teamwork, pleasant environment with good interpersonal relationships<sup>52</sup>; resiliency and support of supervisor/coworkers<sup>53</sup>, and the use of cognitive re-evaluation strategies in the interaction with coworkers<sup>54</sup>. Emotional competencies had both a protective role against stress as well as being a predictor of resilience and psychological well-being<sup>41</sup>. On the other hand, there were moderators that exacerbated the effect of stressors on well-being, such as the low perception of organizational support<sup>12</sup>, the strategies of emotion regulation (ER) when used in the interaction with people from outside the organization, aimed at meeting occupational or organizational rules of expression (emotional labor)<sup>54</sup>, and palliative or avoidant coping<sup>26</sup>.

The investigation of mediators was found in three studies. The first is that of Jackson et al.<sup>46</sup> who tested and confirmed the mediation of burnout in the relationship between work demands and health problems, and the mediation of work engagement in the relationship between resources and commitment at work. The study by Karlsen et al.<sup>27</sup> concluded that the effect of stress on well-being was positively mediated by a problem-focused coping process, associated with a growth component, leading to improved subjective well-being (SWB), and on the other hand, stress was negatively mediated by an avoidance coping process and a distress component, leading to a worsening of SWB. In the study by Kinman and Grant<sup>41</sup>, resilience mediated the relationship between emotional intelligence (EI) and psychological well-being (PWB). Without imputing causality, they suggest that EI has an indirect effect on PWB through resilience (Chart 4).

## **Discussion**

Analysis of the data reveals a distinction in the way WBW is approached. Some studies cover WBW in a combination of positive and negative aspects<sup>6,23,55</sup>. Others differentiate positive WBW and malaise/tension (negative facet of WBW) by adopting separate measures<sup>4,36</sup>. The measurement instruments addressed positive aspects such as psychological (PWB), affective (AWB), and subjective (SWB) well-being; mental and physical health; engagement at work; satisfaction with life and work; and Quality of Work Life (QWL). Negative aspects were addressed by measuring psychological stress, tension, physical and psychological symptoms/disorders, and burnout.

This variety indicates that there is amplitude in the proposed concept/models of well-being related to the complexity of the phenomenon.

It is observed that due to the great diversity of studies, some variables had different roles in the models tested, appearing either as predictors or moderators, positive or negative, of well-being, broadening the understanding of the dynamics of this construct. The lack of social support from peers and leaders was a negative predictor of WBW<sup>17,20</sup>, and its presence was a positive predictor of WBW<sup>17</sup>, also playing a moderating role in the study by McCalister et al.<sup>53</sup> by mitigating the negative effect of stressors. In summary, the lack of social support had a greater negative impact on well-being than its presence contributed to well-being on the positive side<sup>44</sup>. In the study by Lee et al.<sup>56</sup>, the search for social support used as a coping strategy was associated with lower stress and a healthier lifestyle, demonstrating the importance of this factor for employees. The perception of organizational support, in turn, minimized the effect of stressors on WBW<sup>17</sup>, while the low perception of this support had an inverse effect, with negative impact on well-being<sup>12</sup>.

Functional emotion regulation (ER) strategies and emotional competencies were positive predictors of well-being<sup>32,41</sup> as well as protectors against stress in the studies by Sonnentag<sup>17</sup> and Kinman and Grant<sup>41</sup>. In addition, affective well-being was associated with lower levels of stress, depression, and anxiety, in the study by Uncu et al.<sup>57</sup>. In some studies, although moderators were not tested, certain factors may have acted to reduce the effects of stress. This is the case in the study by Goto et al.<sup>58</sup> in which the workers had a positive perception of well-being (satisfaction with life and work), despite the presence of various stressors. It can be assumed that the strategies used to handle them were effective. In the research by Bragard et al.<sup>59</sup> there was high job satisfaction associated with the positive perception of the work itself, although the employees reported many stressors and burnout.

One can see that the work factors (e.g., stressors, lack of resources, difficulties in relationships) were more consolidated as negative predictors that undermine WBW<sup>1,3,6,17,18,21-23,25,35-38</sup>, and personal resources (e.g., self-efficacy, emotion regulation) as positive predictors of WBW<sup>6,17,24,32,33,39-44</sup>. According to the Sonnentag<sup>17</sup> review, the results about personal resources are inconclusive for negative indicators of well-being. It is relevant to highlight controversial and ambivalent aspects found about coping strategies and ER. While, on

the one hand, the use of problem-focused coping proves to be strongly consolidated in the literature as a positive predictor of WBW<sup>6,40,43-45</sup>, as well as related to lower stress and better health status<sup>58</sup>, on the other, the results related to avoidance coping are contradictory. Although this strategy is mainly associated with negative indicators of well-being and health<sup>6,44</sup>, in some situations it appears to have beneficial effects<sup>40</sup>, which reinforces the idea of the importance of regulatory flexibility depending on the context<sup>60</sup>. That is, the use of different ER strategies, depending on the situation, facilitates adaptation to the stressors. In this sense, Lawrence et al.<sup>32</sup> emphasize that it is not the mere use of certain regulatory strategies considered dysfunctional (e.g., suppression of emotions) that causes damage to health, but their habitual use.

## Conclusion

The present review fulfills its objective in providing an overall view of national and international studies that relate stress and well-being at work, highlighting predictors, moderators, and mediators of this relationship. At the national level, it offers an additional contribution, since the two Brazilian review studies that were found analyzed only the predictors of WBW, without considering moderators and mediators. The review also reveals the emergence of new, more complex and sophisticated models, offering new insights into the processes and dynamics of well-being. In addition to the work factors, personal resources (resilience, self-efficacy, emotional competencies, ER, psychological detachment), work-life interface, and group-level factors are included in these models, clarifying the role they play in the relationship between stress and well-being.

Regarding organizational factors, the results indicate that lack of support, of resources, of good relations, and of other aspects related to work have a more negative impact on WBW indicators than their presence contributes to WBW on the positive side. The perception of organizational support and resources at work, especially autonomy and the social support of peers and managers, act as moderators, reducing the negative impact of stress on WBW. Regarding personal resources, they prove capable of letting a person preserve their well-being at work even in adverse conditions. Emotional competencies and functional emotion regulation strategies, besides being predictors of WBW, act as effective moder-

ators, minimizing the negative effects of stressors. It is worth mentioning that although some strategies used to deal with stressful situations are considered adaptive or maladaptive, for being associated more frequently with positive or negative indicators of well-being and health, the consequences may vary depending on the context. The problem-focused coping strategy, for example, carries more benefits than that of avoidance, although the latter may be provisionally useful in situations where control over an adverse environment cannot be managed.

Considering the complexity of this issue, more studies should explore intrapersonal ER strategies, testing their different roles (moderators and mediators), in different situations and occupations, different age groups, including as well the emotion regulation strategies of the other people with whom they interact (interpersonal). In addition, it is noted that few mediators have been tested, representing a gap to be filled. Although it has not been the focus of this review, one can note that there are few studies that explore the effectiveness of interventions in personal resources (regulation skills and emotional competencies) and organizational changes, assessing their effects on stress and well-being.

Another suggestion is to test broader and more integrated models, which consider individual variability regarding demands and stressors,

and the long-term positive and negative results on health and well-being. For this, more longitudinal studies are necessary to infer causality and also to understand the process and the dynamics of well-being at work. Another gap regarding the method refers to broadening the measurement beyond the self-report, with the use of measures of body responses, observation of work, daily monitoring, multi-level measures (e.g., interpersonal, group), integrating quantitative and qualitative analyses.

Regarding the limitations of this study, one can point out the selection of journals, which occurred in various databases and journals relevant to the area, although there may be others not consulted. And there may also be other levels of analysis and approaches about stress and well-being at work, beyond those used in this study.

As a practical contribution, the results found are relevant and can help support policies and programs to improve well-being and reduce stress of workers, from a more careful look at stressors, work resources, organizational and social support, interpersonal relationships, personal resources, and work-life balance. These factors have proven to be highly important and, if not properly treated, may constitute psychosocial risks with harmful consequences for workers' health.

## Collaborations

ALT Hirschle worked on the design, introduction, bibliographic research, methodology, data analysis and interpretation, conclusion and final writing. SMG Gondim worked on analyzing and interpreting the data, guiding and correcting the conclusion, critical review and final writing.

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