

Work Context and Burnout: Confirmation of Moderators from Meta-analysis Evidence

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Keywords:

work design,
occupational stress,
working conditions.

Abstract

Burnout is an important work-health issue with economic costs to organizations and quality of life impacts on individuals. Focusing on Morgeson and Humphrey's contribution to Work Design literature, we identified the general predictive effect of the Work Context factor in burnout and, secondly, listed the moderators that may be useful to improve practices and research when dealing with burnout in organizational contexts. We did a prospective citation literature extraction in the Web of Science database from Morgeson and Humphrey, which retrieved 11 studies after screening and applying inclusion criteria. We analyzed those studies with Mixed-Effect Modeling for meta-analysis. We found an overall positive effect with high heterogeneity for the Work Context factor predicting burnout that was moderated by professional area and model selection bias. Primary results showed the importance of those moderators when dealing with Work Context factor and burnout in health organizations. We also highlight the robustness of the Morgeson and Humphrey model for future developments in Work Design.

Contexto de trabalho e *burnout*: confirmação de moderadores por metanálise

Palavras-chave:

desenho do trabalho;
estresse ocupacional;
condições de trabalho.

Resumo

O burnout é um problema de saúde do trabalho com custos econômicos para as organizações e de qualidade de vida para os indivíduos. Focando-se no modelo de desenho do trabalho de Morgeson e Humphrey (2006), identificou-se o efeito preditivo geral do fator Contexto de Trabalho em burnout e listaram-se os moderadores que podem ser úteis para melhorar as práticas e as pesquisas em contextos organizacionais. Extraíram-se pelo Web of Science 11 estudos prospectivos a Morgeson e Humphrey, após a triagem e a aplicação de critérios de inclusão, e analisaram-se os efeitos para metanálise baseada em Mixed-Effect Modeling. Houve um efeito geral positivo com alta heterogeneidade para o fator Contexto de Trabalho predizendo burnout, sendo a relação moderada por área profissional e viés de seleção do modelo. Os resultados mostraram a importância desses moderadores ao tratar sobre o fator Contexto de Trabalho e burnout em organizações de saúde, bem como destacam a robustez do modelo de Morgeson e Humphrey para desenvolvimentos futuros sobre desenho do trabalho.

Contexto de Trabajo y Burnout: Confirmación de los Moderadores en Meta-análisis

Palabras claves:

diseño del trabajo,
estrés ocupacional,
condiciones de trabajo.

Resumen

El burnout es un problema de salud laboral con costos económicos para las organizaciones y de calidad de vida para los individuos. Se basando en el modelo de Diseño del Trabajo de Morgeson y Humphrey, se identificó el efecto predictivo del factor Contexto de Trabajo en burnout y se listaron los moderadores que pueden ser útiles para mejorar las prácticas e investigaciones al tratar el burnout en organizaciones. Se extrajeron por la Web of Science 11 estudios prospectivos a Morgeson y Humphrey tras la selección y aplicación de criterios de inclusión. Se analizaron los efectos para meta-análisis basada en Mixed-Effect Modeling. Se observó un efecto general positivo con alta heterogeneidad para el factor Contexto de Trabajo, prediciendo burnout, siendo la relación moderada por área profesional y enfoque de selección del modelo. Los resultados mostraron la importancia de los moderadores al tratar el factor Contexto de Trabajo y burnout en organizaciones de salud. Se destaca la robustez del modelo de Morgeson y Humphrey en Diseño del Trabajo.

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Burnout is a health issue, with high impact in organisational contexts, that lowers workers productivity in different job contexts due to exhaustion (Galbraith & Merrill, 2015) and reduces their personal conditions for regular and effective performance at work (Costa & Pinto, 2017). It is a chronic emotional and interpersonal response to stressors on a job that may lead to exhaustion, cynicism, and professional inefficacy (Maslach & Leiter, 2016a). The first studies were undertaken in the 1970s and today, almost 50 years of research, point out to the complexity of the construct (Maslach, Schaufeli, & Leiter, 2001). Currently, it is a broad health-labor problem including health, educational and others organizational sectors with high costs to company's productivity and individual's quality of life (Cortez, Souza, Amaral, & Silva, 2017; Dias & Angélico, 2018; Maske, Riedel-Heller, Seiffert, Jacobi, & Hapke, 2016). In Brazil, it is considered an occupational disease recognised by Social Security since 1999, benefit B91 (Brasil, 1999; Cardoso, Baptista, Sousa, & Goulart Junior, 2017).

Commonly, studies analyse the influence of psychological attributes and situational factors that may predispose or protect individuals of burnout. Type A personality, which is related to anxiety and perfectionism for high achievement, may predispose burnout when workers do not believe they had reached a respectable performance at work (Sanchez & Oliveira, 2016). On the other hand, hardiness to stressors and coping for acting in front of ambiguity focusing on solving problems act as personal protectors (Ayala-Calvo & García, 2018). Situational aspects like social and familiar support improve individuals' abilities to overcome burnout (Woodhead, Northrop, & Edelstein, 2016).

Also, organisational processes may foster burnout or prevent their aggravation. Positive organisational climate focusing on supportive relationship may act as a protective organisational variable (Borkar, 2016). Ergonomics practices that integrate workers verbalisation about work conditions and job prescriptions also may diminish burnout occurrence (Ferreira, 2015). Although, inefficient ergonomic practices that offer low autonomy and overload workers with constant high demands, elevated complexity tasks, and stressful conditions seem as negative influencers and may foster burnout (Ladstätter et al., 2015; Riall et al., 2018). Hence, it is fundamental to accurately assess structural and aspects that may influence burnout, in order to lower its impacts in organisational contexts.

One of the most influential variables in Interdisciplinary Ergonomics to understand the relationship between psychological attributes and organisational contexts associated with burnout is Work Design (Read, Salmon, & Lenné, 2014; Stanton et al., 2013). However, despite the tradition of Work Design literature and its correlates, it is not an unequivocal theoretical and conceptual framework (Grant & Parker, 2009). Exploring specifically the Work Design literature, Hackman and Oldham (1975) settled the basis of this topic with job characteristics analysis (task variety, job autonomy, task significance, task, identity, and job feedback). New task characteristics theoretical and measurement approaches were included later by Campion and Thayer (1985), but it lacked in replicability. During many years there were not many contributions to improve Work Design construct, instead of the high impact of it on health-labour and work effectiveness (Humphrey, Nahrgang, & Morgeson, 2007).

In the early 2000s, Morgeson and Humphrey (2006) proposed a successfully replicated theoretical and measurement model. Theoretically, their model improved from a task-centred to a relational and amplified Work Design analysis. In the measurement perspective, it allowed measuring factors like Tasks Characteristics,

Knowledge Characteristics, Social Characteristics, and Work Context, with high-level statistical evidence across different countries (Fernández-Ríos et al., 2017; Khandan et al., 2018). In a recent perspective, Work Design is the description of how jobs, tasks, and roles are generated and modified at workplace impacting organisations, groups and individuals. It focuses on the dynamics between task characteristics, worker personal aspects, and work context factors that improve organisational processes and outputs (Parker, 2014).

In our paper, we decided to focus in the Work Context factor that seems as one of the core components of Work Design literature, which highlights the importance of that factor under theoretical and practices developments to understand labour and organisational conditions (Humphrey et al., 2007; Parker, Morgeson, & Johns, 2017; Parker, Van den Broeck, & Holman, 2017). Specifically, Work Context is one of the factors of the Work Design model, and it is relevant to the comprehension of burnout when dealing with demands to workers readjustments considering tasks characteristics and labour conditions (Demerouti, Bakker, Nachreiner & Schaufeli, 2001; Maslach & Leiter, 2016b). Settled in that definition, we considered representative of Work Context factor variables from different theoretical models that would lead to a better comprehension of contextual and ergonomics stressors relevant to burnout prediction like workload (Adil & Baig, 2018; Roy, Weijden, & Vries, 2017) and job demand (Kim, 2016; Rouxel, Michinov, & Dodeler, 2016), since those contents fits with Morgeson and Humphrey (2006) definition for the factor.

We started our analyses from Morgeson and Humphrey (2006) considering the dominance of that model in Work Design literature. Specifically, we were interested in analysing the impact of the Work Context factor in burnout, that leads us to two main objectives. First, we identified the general predictive effect of Work Context factor in burnout and, secondly, we listed the moderators that may be useful to improve organisational practices and research when dealing with burnout at organisational contexts. To achieve the proposed objectives a meta-analysis was carried out, once this analysis shows more accurate results than those obtained individually in each of the seminal studies, and also, it allows comparing quantitative similarities and distinctions between previous research (Field & Gillet, 2010; Rosenthal & DiMatteo, 2001).

Method

Data Extraction

We retrieved data from the Web of Science database using prospective citation literature extraction. We opted to this base considering its extensive coverage between interdisciplinary topics like burnout, which is a health and social science research theme. We also used Morgeson and Humphrey (2006) publication as our baseline for prospective research, considering it is the primary framework for contemporary developments about the Work Context factor, which lead us to 599 citations manuscripts worldwide. Then, we deleted 47 repeated occurrences retrieving 552 documents. From those 552, we applied the exclusion criterion of document type as peer review article with full document available, that let us 64 remove manuscripts and keep 488 full articles for the next step.

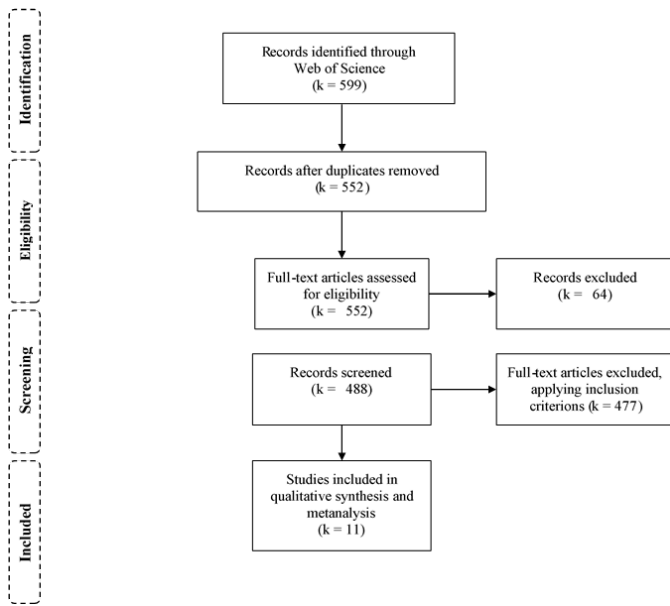


Figure 1. Data Extraction Workflow Diagram. Adaptation from Moher, Liberati, Tetzlaff, Altman, & Prisma Group (2009).

Next, we read titles and abstracts in order to apply the following inclusion criterion: 1) Study focused on predicting burnout. It led us to delete 424 studies and keep 62 full articles. Those 62 full articles were read to apply other inclusions criteria: 2) Work Context factor were included as a predictor variable. 3) Empirical evidence was robustly reported to generate summary statistics for meta-analysis. In step 2) we reduced from 62 to 12 full articles, considering 50 articles did not list variables referring to the Work Context factor as a predictor. In step 3), we went from 12 full articles to 11 included on meta-analysis, since we did not find enough empirical evidence reports in 1 study to generate summary statistics.

Data Analysis

We created descriptive tables from data extracted and analysed summary statistics for meta-analysis model in Jamovi 0.9.5.12 (Jamovi, 2018). For the meta-analysis procedure, we implemented MAJOR Meta-analysis 1.0.0 R addon (Hamilton, 2018). We used correlation index correcting estimation bias with Fisher’s r-to-z coefficient for Forest Plot data screening, meta-regression modelling and Funnel Plot (Silver & Dunlap, 1987). We also implemented a Mixed-Effect Modeling (Brockwell & Gordon, 2001), once there was high heterogeneity for most of the models with limited k sample studies (k = 11) for modelling effects. For modelling fit, we described AIC and BIC indexes (Burnham & Anderson, 2004) and Funnel Plot Asymmetry (Sterne et al., 2011). We also performed publications bias analyses using Fail-Safe N under Rosenthal criterion (Orwin, 1983).

Results

We retrieved 11 studies, most of those empirical (k = 10) and with graduated or postgraduate participants (k = 6). In average, studies had 371 or higher sample size (M = 818.81; SD = 1171.05), mainly female (k = 6). The predominant professional area were health specialists (k = 5 – nurses, pharmacists), followed by doctors and therapists (k = 2 – physicians, psychotherapist, art therapists) and welfare services (k = 3 – social service, firefighters, police officers) as shown in Table 1.

Most of studies were conducted in Europeans (k = 5) and Orientals (k = 4) countries in public organisations (k = 4). Mainly, low hierarchy workers answered to studies (k = 7) that showed high variation between theoretical and measurement models. Morgeson and Humphrey (2006) model were the only full or partially replicated (k = 3), while the others come up with other models without replication in the studies analysed (k = 8). In general, Work Context factor had a wide variation of comprehension between those studies, usually covering high demands at work and ineffective practices that may stress individuals and influence positively

Table 1
Summary of Studies Included in Meta-analysis

Author	Method	Sample Size	Education	Gender	Profession	Country	Type	Hierarchy Level	Model Bias	r (WC – B)
Adil, M. S. et al. (2018)	Empirical	352	Postgraduate	M	Health specialists	Pakistan	Private	Mid/Top	Rothmann, Mostert, and Strydom (2006)	0.465
Roy, A., et al. (2017)	Empirical	384	Graduated	F	Doctors and therapist	Bangladesh	Public-private	Mid/Top	Content and face validity	0.179
Kim, Y. (2016)	Empirical	163	Postgraduate	F	Doctors and therapist	Korea	Public	Mid	Korea Occupational Safety and Health Agency (2004)	0.156
Rouxel, G. et al. (2016)	Empirical	371	NA	F	Health specialists	France	NA	Low	Karasek et al. (1998)	0.490
Jiang, X. et al. (2016)	Empirical	1125	Graduated	M	Welfare servicer	China	Public-private	Low	Scheier, Carver, and Bridges(1994)	0.244
Kubicek, B. et al. (2015)	Empirical	591	High school	F	Homecare	Austria	Private	Low	Büssing and Glaser’s (2002)	0.020
Lundqvist, D. et al. (2013).	Empirical	4096	Graduated	F	Health specialists	Sweden	Public	Low	Theorell and Karasek (1996)	0.380
Scanlan, J. N. et al. (2013)	Empirical	34	Graduated	F	Health specialists	Australia	Public	Low	Morgeson and Humphrey, (2006)	-0.020
Zaniboni, S., et al. (2013)	Empirical	117	High school	M	Adm. staff	Italy	NA	Low	Morgeson and Humphrey, (2006)	0.020
Van den Broeck, A. et al. (2012)	Empirical	307	High school	M/F	Welfare servicer	Belgium	Public	Low	SIMPH; Notelaers et al. (2007)	0.240
Nahrgang, J. D. et al. (2011)	Meta-analysis	1467	NA	NA	Health specialists	NA	NA	NA	Morgeson and Humphrey, (2006)	0.190

Note. F = Female; M = Male; NA = Not Available; r = Correlation; WC = Work Context factor; B = Burnout.; Adm. = Administrative.

in burnout occurrence. From all those studies, we generated the overall effect and fit statistics for Work Context factor predicting burnout as displayed in Table 2.

Overall Work Context factor prediction effect in burnout were positive ($\beta = 0.242$; $p < .001$; [IC 95%] = 0.140 – 0.345). Variation

Table 2
Overall Effect and Fit Statistics for Work Context factor Predicting Burnout ($k = 11$; Mo = None)

	Effect					Fit						
	Estimate	SE	Z	p	[CI 95%]	T^2	I^2	df	Q	p	AIC	BIC
WC	0.242	0.052	4.630	<.001	[0.140 – 0.345]	0.025	94.50%	10.00	163.227	<.001	-2.908	-2.112

Note. k = Number of studies; Mo = Moderator; WC = Work Context factor.

between studies showed also relevant ($T^2 = 2.50\%$) with substantial heterogeneity ($I^2 = 94.50\%$). Fail Safe-N test indicated a large sample size to change effect to not statistically significant ($n = 1872.00$; $p < .001$). AIC and BIC fit indexes were, respectively, -2.908 and -2.112. We demonstrate in Figure 2 a diagrammatical synthesis of studies effects, confidence interval and summary RE (Random Effect) for the meta-analytical Mixed-Effect Modeling.

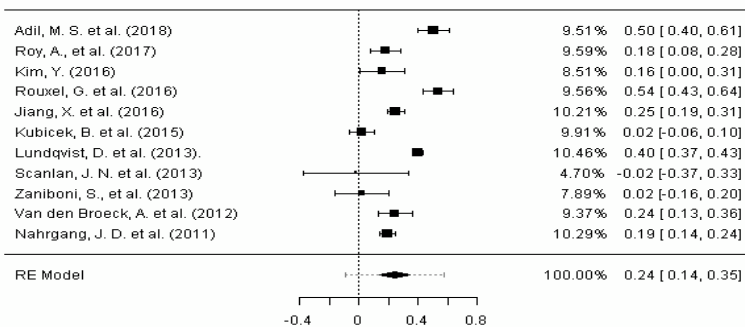


Figure 2. Forest Plot of Mixed-Effect Modeling.

Lundqvist et al. (2013) had the highest effect ($\beta = 0.40$), while Scanlan et al. (2013) come with up with the only negative effect ($\beta = -0.02$). Essentially, ten out of 11 studies pointed out to a positive prediction effect of Work Context factor in Burnout. Nahrgang et

Table 3
Overall Effect and Fit Statistics for Work Context factor Predicting Burnout ($k = 11$; Mo = Professional Area)

	Effect					Fit						
	Estimate	SE	Z	p	[CI 95%]	T^2	I^2	df	Q	p	AIC	BIC
WC	-0.055	0.065	-0.857	>.005	[-0.183 – 0.072]	0.004	69.04%	10.00	37.257	<.001	-12.345	-11.151
Mo	0.243	0.046	5.276	<.001	[0.153 – 0.334]							

Note. k = Number of studies; Mo = Moderator; WC = Work Context factor.

al. (2011), Lundqvist et al. (2013) and Jiang and Yang (2016) studies contributed with at least 10% of the model composition. The effect ($\beta = 0.24$) ended up with a broad confidence interval [CI 95% = 0.14 – 0.35] for its estimation. Therefore, studies with effects lower or higher than CI contributed to model statistics of asymmetry ($Z = -1.537$; $p > .050$) as shown in Figure 3.

Next, we explored moderators on the predicting relationship between Work Context factor and burnout, since it may be suitable for models with high heterogeneity (Rosenthal & DiMatteo, 2001). We tested the following moderators: a. method (empirical vs. meta-analysis); b. educational level (graduated and postgraduate vs. non-graduated); c. gender (female vs. male); d. country (Europeans vs. Orientals); e. organisation type (public vs. private) and f. hierarchy level (top and mid vs. low). All those variables did not show statistically significant moderation ($p > .05$) or improvements for the general model. However, we found a moderation effect considering

professional areas (health workers and specialists vs. welfare services and administrative staffs) as displayed in Table 3.

We discovered that overall effect of Work Context factor predicting burnout is diminished ($\beta = -0.055$; $p > .050$; [IC 95%] = -0.183 – 0.072) when considering professional area. In that case, the effect it

is higher to health workers when compared to welfare services and administrative workers ($\beta = 0.243$; $p < .001$; [IC 95%] = 0.153 – 0.334). Variation between studies showed low value ($T^2 = 0.40\%$) with substantial heterogeneity ($I^2 = 69.04\%$). Fail Safe-N test indicated a large sample size to change effect to not statistically significant ($n = 1872.00$; $p < .001$). AIC and BIC fit indexes were, respectively, -12.345 and -11.151 and only a few studies showed asymmetry in Funnel Plot ($Z = -1.118$; $p > .050$) as evidenced in Figure 4.

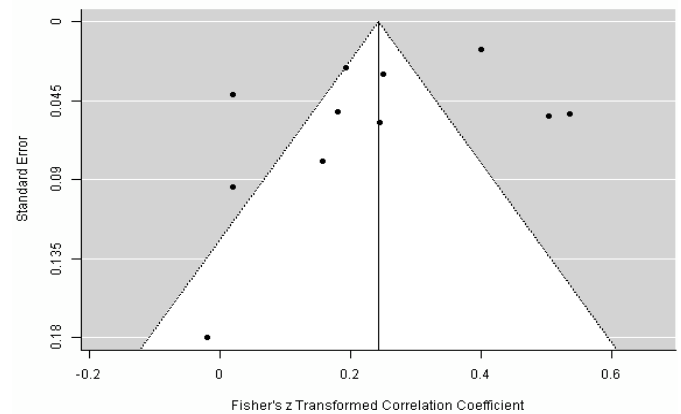


Figure 3. Funnel Plot Without Moderators.

We also found a moderation effect when we analysed replicable vs. non-replicated models (Morgeson and Humphrey vs. others). We called it as model bias, since we analyzed that prediction relationship got lower ($\beta = 0.076$; $p > .050$; [IC 95%] = -0.058 – 0.211) when we controlled models' influences. The prediction relationship of Work Context factor in burnout were higher when using other models ($\beta = 0.253$; $p < .005$; [IC 95%] = 0.091 – 0.416), instead of only Morgeson and Humphrey (2006) basis as shown in Table 4.

Variation between studies showed average value ($T^2 = 11.30\%$) with elevated heterogeneity ($I^2 = 87.85\%$). Fail Safe-N test indicated a large sample size to change effect to not statistically significant ($n = 1872.00$; $p < .001$). AIC and BIC fit indexes were, respectively, -7.930 and -6.736. We did not find studies showing asymmetry in the Funnel Plot ($Z = -1.146$; $p > .050$) when controlling model bias as disposed of in Figure 5.

Table 4
Overall Effect and Fit Statistics for Work Context factor Predicting Burnout ($k = 11$; $Mo =$ Model Bias)

	Effect					Fit						
	Estimate	SE	Z	p	[CI 95%]	T^2	I^2	df	Q	p	AIC	BIC
WC	0.076	0.068	1.110	> .050	[-0.058 – 0.211]	0.113	87.85%	10.00	76..612	<.001	-7.930	-6.736
Mo	0.253	0.083	3.050	<.005	[0.091 – 0.416]							

Note. k = Number of studies; Mo = Moderator; WC = Work Context factor.

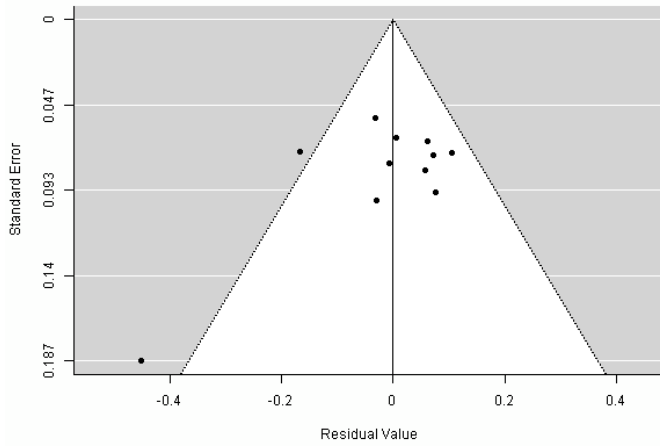


Figure 4. Funnel Plot With Moderator (Professional Area).

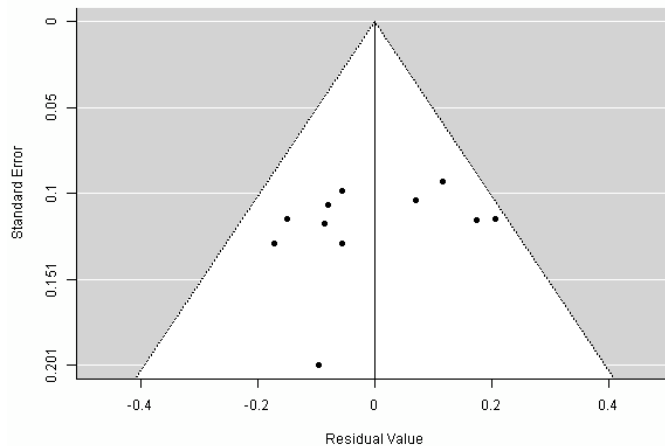


Figure 5. Funnel Plot With Moderator (Model Bias).

Discussion

In synthesis, we found the overall effect of Work Context factor predicting burnout as positive with high heterogeneity impact, that got a higher level when we did not control moderators. Analysing moderators, we discovered: a. method (empirical vs. meta-analysis); b. educational level (graduated and postgraduate vs. non-graduated); c. gender (female vs. male); d. country (Europeans vs. Orientals); e. organisation type (public vs. private) and f. hierarchy level (top and mid vs. low) as non-important variables when dealing with Work Context factor prediction of burnout. Nevertheless, it is relevant to consider the moderation effect of the professional area (health workers and specialists vs. welfare services and administrative staffs) and model bias (Morgeson and Humphrey vs. others), since those showed significantly.

The positive impact of the Work Context factor in burnout converged with literature. Especially, burnout symptoms related to exhaustion seems positively correlated with Work Context factors,

when there are high psychological, affective, cognitive and psychological demands, lack of supportive work conditions and ineffective ergonomics practices (Adil & Baig, 2018; Dias & Angélico, 2018; Demerouti et al., 2001). The average positive effect also converged with another meta-analysis from literature which supports our metamodeling (Nahrgang et al., 2011). Despite that evidence, we cannot make any further conclusion about the replicability of the effect range we found, once our models' heterogeneity showed prominently.

Regardless, we still hypothesise the importance of our models considering the optimisation of heterogeneity level we found once controlling moderators between Work Context factor and burnout. For example, professional area moderation had support from literature. Burnout syndrome seems more present and relevant in health workers when compared to other professional classes (Ladstätter et al., 2015; Riall et al., 2018). We also hypothesise a practical implication of this evidence considering the convergence between our moderators and literature: it is fundamental to foster protective management and ergonomics politics and practices with workers from health area to improve their work conditions when considering burnout syndrome (Sanchez & Oliveira, 2016). Work Context factor in health organisation may include higher job complexity and demands since it also related to high stakes decisions, cognitive and emotional stresses for taking care of ill patients, which impacts the burnout occurrence at health's workers (Costa & Pinto, 2017). In that situation, the implementation of strategies of Work Design as management practice may lower job complexity and demands, giving workers better condition to resist and overcome burnout.

Another important moderator example is Model Bias. When moderating other models against Morgeson and Humphrey (2006) we found a better fit of our metamodeling using Morgeson and Humphrey model assumptions. We see that evidence as an affirmation that, after its foundation with Hackman and Oldham (1975), Morgeson and Humphrey showed up as a new core and highly replicated model for Work Design between different cultures. Considering our meta-analysis, we recommend Morgeson and Humphrey formulation when dealing with Work Context factor predicting burnout in organisations, since other models may mislead its effect, covering a broader range than what it would be, while that model improved our meta-analysis heterogeneity levels.

Focusing on practitioners, from the evidence we found in meta-analysis, we also suggest some implication for organisational and management practices. It is fundamental to differ the Work Context factors between health workers vs welfare and administrative staff. In that case, Morgeson and Humphrey (2006) model may be a core instrumental for analyses and practices. Using that model may reduce overestimation of Work Context factor and guide practitioners for optimal management practices at Work Design. Especially, when dealing with Work Context factor and burnout, we believe that Morgeson and Humphrey can be useful to identify situational stressors, arrange job demands and specify workload to improve labour conditions to a health promotion level.

For future researchers, we also suggest the continued use of the foundation highlighted by Hackman and Oldham (1975) and

improved with Morgeson and Humphrey (2006). It is also outstanding the lack of evidence from North America and Latin American countries, that shows the necessity of expanding those models for that locations, once we did not find studies from those countries dealing with Work Context factor and burnout. Considering limitations from our meta-analyses, we realised that the low number and different theoretical background we found between studies implied in part of the heterogeneity, which may have an impact in confidence interval and model's generalisation. In that case, it is essential to improve future theoretical and empirical developments about Work Context factor in order to optimise its comparison and the replicability of our meta-analysis effects.

We also highlight another limitation of our study. We were not able to split Work Context factor into specific components like work demands (muscular, affective and cognitive), work conditions, ergonomics and equipment use, since studies did not list that information. In that case, it is essential to further studies consider those specific arrangements about Work Context factor to improve the factor comprehension in future developments. We advise as a research agenda effort on other factors of Work Design and its relation to micro, meso and macro level processes and results in order to improve occupational health, management, and organisational practices that focus on promoting better labour conditions for workers.

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