

The threat of COVID-19 and its influence on nursing staff burnout

Guadalupe Manzano García  | Juan Carlos Ayala Calvo 

Department of Sciences Education,
University of La Rioja, Logroño, Spain

Correspondence

Guadalupe Manzano García, Department of
Sciences Education, La Rioja University, C/
San José de Calasanz s/n, 26004 Logroño,
Spain.

Email: guadalupe.manzano@unirioja.es

Funding information

This research received no specific grant
from any funding agency in the public,
commercial, or not-for-profit sectors.

Abstract

Aims: To evaluate whether the perceived threat of COVID-19 moderates the influence of work resources and demands on burnout.

Design: A cross-sectional study.

Methods: We used a convenience sample of 771 nurses working in 10 hospitals in northern Spain. The data on burnout, demand, and resources at work and the perceived threat of COVID-19 were compiled in the second fortnight of April 2020 using an online questionnaire. We used several hierarchical linear regression models.

Results: Work overload, material and human resources and social support at work were significant in explaining burnout. The perceived threat of COVID-19 variable was also significant and presented the highest regression coefficient ($\beta = 0.392$). The perceived threat of COVID-19 moderated the relationship between social support at work and burnout.

Conclusion: The perceived threat of COVID-19 helped to explain the degree of burnout in nurses and moderated the relationship between social support at work and burnout.

Impact: Hospitals should implement strategies to ensure that health emergency situations are not perceived as a threat. In pandemics, the organization should maintain clear, fluid, and regular communication with the nursing staff, which would help increase staff members' confidence and sense of control.

KEYWORDS

burnout, COVID-19, nursing staff, perceived threat, social support, Spain

1 | INTRODUCTION

The global pandemic generated by COVID-19 led to nurses playing an unprecedented central role in controlling the virus. Despite various population containment measures decreed by health authorities around the world, the number of infected cases increased dramatically and brought some countries' health systems to the brink of collapse (World Health Organization, 2020). In Europe, this situation was especially critical in Italy and Spain, countries where it was necessary to relocate and redefine the tasks of health professionals

working in the health system to provide the necessary care to those affected by COVID-19 (Bernardo et al., 2020).

Pandemics can have a significant psychological impact on nurses, who are essential to the healthcare response (Fernandez et al., 2020). Previous studies have shown that pandemics exacerbate the stress felt by nurses, as they cope with intense emotional, physical, and cognitive demands (Chen et al., 2020; Shih et al., 2007). Professionals faced suffering, pain and death on the front line, and significant ethical dilemmas. Besides, material and human resources were scarce, making nurses' daily work difficult and subjecting them

to unnecessary risks due to a lack of personal protective equipment and an increased work overload (Inchausti et al., 2020; Ives et al., 2009; Zhao, 2020). In addition, a lack of control over patient flow, bad management and the absence of planning can also generate burnout among nurses (Koh et al., 2012; Lam et al., 2020).

In the case of Spain, the situation generated by COVID-19 pushed nurses to a limit that must have had a strong psychological impact as a result of the stress and frustration they experienced every day and the reduction in rest periods. Before the pandemic, the nurse/patient ratio in Spain was 8.8 patients per nurse. This ratio is far higher than that found in the rest of Europe (5.3 patients per nurse). Due to the high number of infected people arriving at hospitals after the state of health emergency was declared, with an average of 6,000 patients per day (Spanish Ministry of Health, 2020), the average number of patients per nurse increased to 13 and working hours per shift increased from 8–12, endangering patient safety (CNDE, 2020; Rascado Sedes et al., 2020; SATSE Nursing Union, 2020). This arises from a lack of staff, one of the factors that most affected nurses' capacity to manage their significant workload in previous pandemics (Corley et al., 2010; Lam & Hung, 2013).

Nursing professionals' well-being is conditioned by the work and personal resources available. Work resources refers to the physical, psychological, organizational, or social aspects of the work that must be performed to provide quality care (Bakker & Demerouti, 2017). Personal resources refers to a person's characteristics, including those relating to a sense of control and resilience in trying to control their surrounding environment. The theory of demands and resources states that work demands require effort and energy and are predictive of variables such as psychological exhaustion, while resources seek to satisfy basic human needs and help to restore the balance (Bakker & Demerouti, 2017). An imbalance between demands and resources is likely to result in the emergence of psychosocial risks such as burnout syndrome (Farrerons-Nogueras & Calvo-Francés, 2008).

In addition to the job's resources and demands, situational variables such as the perceived threat of a virus that causes acute respiratory infections, for example the perceived threat of COVID-19, could contribute to the appearance of burnout among nurses (Fernandez et al., 2020; Lai et al., 2020; Manzano-García et al., 2017; Shih et al., 2007; Stawicki et al., 2017). However, the idea of a perceived threat among nursing professionals during pandemics has not been studied in much depth (Fernandez et al., 2020).

2 | BACKGROUND

Burnout arises in response to chronic work-related stress when the coping strategies that an individual uses to manage work stressors fail (Rodríguez Carvajal & Rivas Herмосilla, 2011). According to Gil-Monte (2005), burnout is characterized by: (a) loss of enthusiasm for work; (b) psychological exhaustion; (c) indolence, the appearance of negative attitudes and behaviours towards patients and the organization; and (d) the appearance, in some cases, of feelings of guilt.

From the perspective of the job demands-resources model, which is the theoretical approach to nursing staff burnout used in this study, burnout arises when the individual feels that their job's demands are much higher than the resources available to them (Leiter & Maslach, 2004). This model maintains that burnout develops from the interrelationship of two different, yet related, psychological processes occurring simultaneously (Heijden et al., 2018). The first is a process of health deterioration, originating from demands. These become stressors when the individual does not manage to sufficiently recover from the prolonged physical, emotional, and/or cognitive effort that is required of nurses in their job (Demerouti & Bakker, 2011). The second psychological process originates from job resources. Job resources promote an individual's personal growth and development on the one hand and are necessary tools to achieve desired work objectives on the other. This motivational process helps individuals cope with labour demands and therefore contributes to reducing burnout (Bakker & Demerouti, 2014).

The job demands-resources model emphasizes that the specific demands and resources to be used in each investigation should depend on the sample, and the sector of activity where the study participants work (Bakker & Demerouti, 2017). Many demands have been identified by prior literature as predictors of burnout syndrome in nurses. However, only some of these demands have been considered as key in explaining burnout syndrome in nursing staff. These include workload, role conflict, and role ambiguity (Khamisa et al., 2013; Montgomery et al., 2015). Workload refers to the number of tasks the nurse must perform in a given period, the difficulty of the tasks they perform and the volume of information that they must process in relation to the time available. Role conflict refers to situations where the nursing staff member is involved in two incompatible roles whose demands contradict each other. Role ambiguity refers to the degree of unawareness of what the organization expects from the nurse.

Some of the resources considered to be most significant in explaining burnout syndrome in the nursing community that are included in this paper are: autonomy, social support at work, and available human and material resources. Autonomy refers to the discretion granted to nursing staff in managing their work and rest time. Social support at work is defined as the availability of help from others. Human and material resources refers to the quantity and quality of resources available to nursing staff to carry out their work (Alarcon, 2011; Gil-Monte, 2016b).

In recent years, researchers have added various extensions to the job demands-resources model and have integrated personal resources, workers' emotional labour, teamwork, or work-family conflict (Baeriswyl et al., 2016; Kim & Wang, 2018; Montgomery et al., 2015; Xanthopoulou et al., 2007). However, given the parsimony of this model, there are still aspects that could be incorporated into it that are linked to the variables predicting burnout. Manzano-García et al. (2017) suggested that, in addition to job demands and resources, situational variables can influence the development of nursing staff burnout. In this sense, our paper proposes an extension of the job demands-resources model that incorporates a situational variable: perceived threat of COVID-19. Taking what we

have learnt from previous pandemics into account, the perceived threat of COVID-19 can be defined as a construct that covers three interrelated factors: fear of contracting the virus (health risks), fear that the worker or their family may be considered to be possible carriers of the virus and therefore be stigmatized (social risks), and acceptance of the risk of contracting the virus while occupying a nursing role (acceptance of risks) (Koh et al., 2012).

Previous studies have shown that the level of perceived threat is related to age, gender, marital status, and years of experience (Imai et al., 2005; Nickell et al., 2004; Tzeng, 2004). Other organizational variables that have been associated with perceived threat include: protective measures adopted to control and avoid infections in healthcare workers, clarity and speed in adopting and implementing action protocols, specific training courses and psychological support received during and after the pandemic (Balicer et al., 2006; Koh et al., 2005; Nickell et al., 2004).

As with other invisible epidemics, such as the Ebola virus (Paladino et al., 2017; Stawicki et al., 2017), the health situation caused by COVID-19 generated a climate of fear and alarm that may have contributed to the appearance of burnout syndrome among nursing staff globally, but particularly in Spain. On the one hand, this scenario meant that nurses faced a significant increase in both the physical and psychological demands of their work. On the other hand, the perceived threat of COVID-19 both professionally and personally could change nurses' perception of work demands and resources and therefore moderate the influence of these variables on the appearance of burnout. According to Ong et al. (2019) "a perceived stressful situation would involve the perception of high demand relative to the available resources". We therefore propose an extension of the job demands-resources model, which will make it possible to determine both the direct effect of the perceived threat of COVID-19 situational variable on burnout and its moderating effect on the relations between job demands and resources and nursing staff burnout.

3 | THE STUDY

3.1 | 1 Aims

The two aims of this study were: (a) to verify whether the perceived threat generated by COVID-19 contributes to explaining the degree of burnout among nursing staff; and (b) to evaluate whether this perceived threat moderates the influence of resources and demands on burnout.

3.2 | Design

This was a cross-sectional study. The sample needed for this study, calculated with the help of G*Power v.3.1.9.2 software, taking into account an effect size (f^2) of 0.15 (Hair et al., 2016) and a statistical significance level of 0.05, was 189 observations. The final sample comprised 771 nurses, indicating a reliability sample power of 99.97%.

3.3 | Participants

Nursing is a stressful profession, especially in certain services that care for patients in critical situations (Epp, 2012). COVID-19 infections are respiratory and can lead to a severe acute respiratory infection in the most severe cases (Buheji et al., 2020). Therefore, this study's participants were nurses working in the emergency, intensive care, and pneumology units of 10 tertiary hospitals in northern Spain. These services were selected because they corresponded to the work units that saw the highest levels of nursing necessitated by COVID-19 patients. The hospitals were selected based on the network of contacts that the researchers have with nursing staff at these hospitals. 1,975 nurses were recruited, representing 70% of the nurses that work in the services included in this study.

3.4 | Data collection

Data were collected through an online questionnaire using the collaborative software Google Forms. An email containing a brief explanation of the study's objectives was sent by each hospital's head of nursing, along with a link to the questionnaire. Informed consent was the first question on the online questionnaire. Participants could not continue completing the online questionnaire until informed consent was provided. To increase the response rate, two reminders were sent: the first was sent 7 days after the initial email and the second was sent 11 days after the initial email. All the participants were volunteers. Data were collected in the second fortnight of April 2020. Of the 1,975 online questionnaires sent, 771 were completed correctly (response rate = 39%).

3.5 | Instruments

The questionnaire included 60 items. Data on socio-demographic variables were collected. Furthermore, the questionnaire included scales on burnout, demand and resources at work, and perceived threat of COVID-19 (Table 1).

3.5.1 | Socio-demographic variables

Based on previous literature on burnout and pandemics, we asked respondents to provide their gender, age, marital status, type of contract, and years of professional experience (Imai et al., 2005; Maslach et al., 2001; Nickell et al., 2004; Tzeng, 2004).

3.5.2 | Burnout

This was evaluated using the Spanish Burnout Inventory or CESQT (Gil-Monte, 2019). The questionnaire consists of 15 items: 5 to

TABLE 1 Measurement scales and items that comprise each scale

<p>Enthusiasm for the job</p> <p>My job is a stimulating challenge</p> <p>I see my job as a source of personal fulfilment</p> <p>I believe my job positively contributes to me</p> <p>My job is rewarding</p> <p>I feel hopeful about my job</p> <p>Psychological exhaustion</p> <p>I believe I am overworked</p> <p>I feel overwhelmed by work</p> <p>I feel physically tired at work</p> <p>I feel emotionally worn out</p> <p>Indolence</p> <p>I don't feel like dealing with some patients</p> <p>I find many patients unbearable</p> <p>I believe that patients' relatives are annoying</p> <p>I believe I treat some patients with indifference</p> <p>I feel like being ironic with some patients</p> <p>I classify patients according to their behaviour</p> <p>Role conflict</p> <p>I have to do things differently to how I think they should be done</p> <p>I am asked to fulfil roles and tasks that I am not authorised to do</p> <p>I have to work with two or more groups that do things fairly differently</p> <p>I receive incompatible requests from two or more people</p> <p>I am assigned tasks/roles without the resources and material means to fulfil them</p> <p>Role ambiguity</p> <p>I know the degree of authority that I have in my job</p> <p>My job's objectives and goals are clear and planned</p> <p>I know that my responsibilities are in this job</p> <p>I know what criteria I am evaluated against</p> <p>I know exactly what is expected of me at work</p> <p>Work overload</p> <p>When you are working, do you find yourself in particularly tough situations?</p> <p>Have you had to do more than one thing at a time?</p> <p>Have you had problems at work due to the fact that it has been getting progressively more complicated?</p> <p>Is it possible for you to work at a relaxed pace?</p> <p>Do you ever not have sufficient time to complete your work?</p> <p>Do you think that you have to do a job that is too difficult for you?</p> <p>Social support</p> <p>Do you feel appreciated by your direct supervisor in your job?</p> <p>Do you feel appreciated by your colleagues in your job?</p> <p>Do you feel appreciated by the centre's management in your job?</p> <p>How often does your supervisor help you when you have problems at work?</p>

TABLE 1 (Continued)

<p>How often do your colleagues help you when you have problems at work?</p> <p>How often does the centre's management help you when you have problems at work?</p> <p>Do you feel supported by your family when you have problems at work?</p> <p>Do you feel supported by the centre's users when there are problems?</p> <p>Autonomy</p> <p>In this job I have the independence to decide how to do it</p> <p>This job gives me opportunities to use my initiative</p> <p>I depend on what my supervisor tells me or orders to do my job</p> <p>I believe that my job provides me with sufficient autonomy</p> <p>I can determine my own working pace</p> <p>Material and human resources</p> <p>Technological resources</p> <p>Staff to cover service needs</p> <p>Regularly used material</p> <p>Adequate rest areas</p> <p>Adequate protection measures</p> <p>The professionals have authority or influence</p> <p>The administration is concerned with the problems of its professional collective</p> <p>Perceived threat of Covid-19</p> <p>I am scared of getting infected with Covid-19</p> <p>I am scared that I or my family will be stigmatised due to being possible Covid-19 carriers</p> <p>Getting infected with Covid-19 is a risk that forms part of my job</p> <p>The coronavirus has worsened the quality of my life</p>
--

measure enthusiasm for the work, 4 to measure psychological exhaustion, and 6 to measure indolence. Respondents expressed the frequency with which they had the thoughts presented in each item using a Likert-type scale ranging from 0 (never)–4 (very often/every day). High scores in psychological exhaustion and indolence and low scores in enthusiasm for work are characteristic of people suffering from burnout. The Cronbach's alpha coefficients were 0.85 for the total scale, 0.90 for enthusiasm for work, 0.85 for psychological exhaustion, and 0.74 for indolence (Gil-Monte, 2019). In our study, Cronbach's alpha coefficients were 0.86 for enthusiasm for work, 0.81 for psychological exhaustion, and 0.80 for indolence.

Part of the UNIPSCO Battery was used to evaluate certain psychosocial factors of demand and resources in the context of work (Gil-Monte, 2016a, 2016b). Three psychosocial factors of demand were evaluated: role conflict, evaluated using 5 items; role ambiguity, evaluated using 5 items; and work overload, evaluated using 6 items. The Cronbach's alpha coefficients were 0.77 for role conflict, 0.79 for role ambiguity and 0.72 for work overload (Gil-Monte, 2016a). In our study, all scales showed Cronbach's alphas ranging from 0.71–0.78, with a critical value above 0.70 (Nunnally & Bernstein, 1994).

(Continues)

TABLE 2 Sociodemographic Characteristics of Participants (N = 771)

Variables	N	%
Gender		
Female	694	90.00
Male	77	10.00
Age		
≤25 years	63	8.17
25–30 years	103	13.36
31–35 years	82	10.64
36–40 years	93	12.06
41–45 years	88	11.41
46–50 years	105	13.62
51–55 years	131	16.99
56–60 years	86	11.15
61–65 years	20	2.59
Marital status		
Single	159	20.62
Married	610	79.12
Divorce	2	0.26
Type of contract		
Fixed contract	451	58.50
Temporary contract	289	37.48
Another type of contract	31	4.02
Years of professional experience		
1–5 years	174	22.57
6–10 years	108	14.01
11–15 years	95	12.32
16–20 years	69	8.95
21–25 years	107	13.88
26–30 years	110	14.27
31–35 years	71	9.21
36–40 years	35	4.54
41–45 years	2	0.26
Work unit		
Emergency	266	34.50
Intensive Care	187	24.25
Pneumology	318	41.25

Two psychosocial factors of resources were evaluated: social support, evaluated using 8 items and autonomy, evaluated using 5 items. For all factors, the scale had a Likert-type response format from 0 (never)–4 (very often/every day). The Cronbach's alpha coefficients were 0.84 for social support and 0.84 for autonomy (Gil-Monte, 2016b). In our study, Cronbach's alpha coefficients were 0.78 for autonomy and 0.79 for social support.

The material and human resources were also evaluated using the UNIPSICO Battery (Gil-Monte, 2016b). The questionnaire consists of 7 items. Using a Likert-type scale ranging from 0 (none)–4

(many), respondents indicated the availability of resources. The Cronbach's alpha coefficient was 0.83 (Gil-Monte, 2016b). In our study, Cronbach's alpha of the scale was 0.98.

Scale of perceived threat of COVID-19. A scale was developed for this study to assess participants' perception of the personal or professional threat posed by COVID-19. The scale consists of four items. The respondents responded using a Likert-type scale ranging from 0 (not at all)–4 (a lot). To evaluate the scale's internal structure, or dimensionality, we performed a principal component analysis. The results of Bartlett's test of sphericity $\chi^2(10) = 1,890.53$, $p < 0.001$ and the KMO index = 0.841 confirmed the suitability of this measurement for factor analysis. Principal component analysis with PROMAX rotation showed the existence of a single factor with an eigenvalue greater than 1, which explained 63.06% of the variance. Cronbach's alpha of the scale was 0.81.

3.6 | Ethical considerations

This study followed the rules established by the Academic Committee of the Faculty to which the study's authors belong. The study was conducted under the ethical standards and criteria of the Helsinki Declaration of 1975, revised in 2000. Before the investigation, the Academic Committee reviewed and approved the study's ethical guidelines (Approval number: 2020-034A).

3.7 | Statistical analysis

The variables were described using percentages, means and standard deviations. We used Pearson's correlation analysis to analyse the relationship between the variables. To determine what role resources, demands and the perceived threat of COVID-19 play in explaining nurse burnout, we used several hierarchical linear regression models. In all of them the outcome variable was burnout. In Model 1 the explanatory variables were the socio-demographic variables; in Model 2 we introduced socio-demographic variables and then introduced variables related to demands (role conflict, role ambiguity, and work overload) and resources (autonomy, social support, and material and human resources). In Model 3 we added the perceived threat of COVID-19 variable as a third stage. To determine whether the perceived threat of COVID-19 situational variable moderated the relationship between the resource and demand variables and burnout we conducted a moderation analysis. To this end, in Model 4, we added a fourth step, the interaction terms role conflict \times perceived threat of COVID-19, role ambiguity \times perceived threat of COVID-19, work overload \times perceived threat of COVID-19, autonomy \times perceived threat of COVID-19, social support \times perceived threat of COVID-19 and resources \times perceived threat of COVID-19.

The validity of each of the 4 models analysed was evaluated according to the R^2 , the adjusted R^2 , and the F -test of statistical significance. All analyses were performed with the programme SPSS Statistics version 26.0 (IBM Corp Released, 2013).

TABLE 3 Means (M), standard deviations (SD), correlations among variables and 95% confidence intervals (in brackets)

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. G	1.900	0.300	1												
2. A	42.396	11.399	-0.071 (-0.144; -0.001)	1											
3. MS	1.209	0.407	0.056 (-0.083; 0.057)	0.056 (-0.021; 0.129)	1										
4. TC	1.455	0.573	-0.007 (-0.082; 0.066)	-0.672 (-0.714; -0.624)**	0.015 (-0.052; 0.091)	1									
5. PE	17.092	11.384	-0.027 (-0.098; 0.039)	0.922 (0.904; 0.938)**	0.029 (-0.045; 0.098)	-0.690 (-0.726; -0.650)**	1								
6. B	2.499	0.315	0.015 (-0.059; 0.095)	0.229 (0.148; 0.229)**	-0.034 (-0.116; 0.040)	-0.213 (-0.277; -0.142)**	0.208 (0.131; 0.283)**	1							
7. AU	2.112	0.616	-0.045 (-0.120; 0.095)	-0.063 (-0.139; 0.008)	0.028 (-0.039; 0.098)	0.069 (0.001; 0.142)	-0.046 (-0.120; 0.027)	-0.227 (-0.302; -0.154)**	1						
8. RC	1.437	0.671	-0.018 (-0.093; 0.058)	0.038 (-0.031; 0.106)	-0.007 (-0.086; 0.065)	-0.067 (-0.133; 0.002)	0.014 (-0.058; 0.086)	0.426 (0.360; 0.490)**	-0.157 (-0.227; -0.078)**	1					
9. RA	1.210	0.755	0.002 (-0.078; 0.076)	-0.009 (-0.076; 0.065)	0.041 (-0.027; 0.114)	0.003 (-0.062; 0.073)	-0.020 (-0.087; 0.059)	0.244 (0.176; 0.314)**	-0.358 (-0.417; -0.299)**	0.325 (0.251; 0.395)**	1				
10. WO	2.531	0.587	-0.010 (-0.078; 0.064)	0.071 (-0.008; 0.144)	-0.023 (-0.101; 0.050)	-0.109 (-0.180; -0.035)**	0.064 (-0.018; 0.138)	0.583 (0.535; 0.628)**	-0.149 (-0.218; -0.077)**	0.526 (0.526; 0.474)**	0.179 (0.106; 0.249)**	1			
11. SS	1.986	0.677	-0.019 (-0.102; 0.062)	-0.178 (-0.248; -0.107)**	-0.035 (-0.109; 0.040)	0.141 (0.078; 0.208)**	-0.165 (-0.235; -0.093)**	-0.508 (-0.562; -0.451)**	0.237 (0.167; 0.308)**	-0.362 (-0.420; -0.299)**	-0.302 (-0.371; -0.239)**	-0.408 (-0.469; -0.347)**	1		
12. MHR	1.783	0.732	0.044 (-0.029; 0.112)	-0.247 (-0.313; -0.177)**	0.017 (-0.052; 0.092)	0.191 (0.125; 0.259)**	-0.230 (-0.297; -0.160)**	-0.404 (-0.480; -0.328)**	0.124 (0.051; 0.196)**	-0.282 (-0.354; -0.212)**	-0.149 (-0.225; -0.077)**	-0.297 (-0.374; -0.231)**	0.289 (0.217; 0.357)**	1	
13. PTC	2.625	0.966	-0.059 (-0.118; 0.005)	0.173 (0.098; 0.247)**	-0.002 (-0.077; 0.070)	-0.152 (-0.222; -0.083)**	0.156 (0.086; 0.224)**	0.683 (0.648; 0.715)**	-0.232 (-0.301; -0.154)**	0.466 (0.412; 0.514)**	0.246 (0.184; 0.310)**	0.616 (0.574; 0.659)**	-0.537 (-0.588; -0.480)**	-0.381 (-0.447; -0.314)**	1

Abbreviations: A, age; AU, autonomy; B, burnout; G, gender; MHR, material and human resources; MS, marital status; PE, professional experience; PTC, perceived threat of Covid-19; RA, role ambiguity; RC, role conflict; SS, social support; TC, type of contract; WO, work overload.

**p* < 0.05.

***p* < 0.01.

3.8 | Validity, reliability, and rigour

Before the online questionnaires were sent, a preliminary investigation was carried out with 95 nurses from a tertiary hospital in the north of Spain. All of them worked in the emergency, intensive care, and pneumology units and decided to participate voluntarily. The results of these questionnaires were not included in further analyses. The study aimed to confirm the clarity of the items and the validity of the content of the scales used in the study. The pilot study's participants concluded that the clarity of the items was good. The measurement instruments used were in Spanish and demonstrated adequate psychometric properties. To reduce the risk of bias in the analysis, it was decided that questionnaires that were incomplete or showed repeated options in one scale were excluded.

4 | RESULTS

4.1 | Participants' sociodemographic characteristics

The average age of the participants was 42.38 years (*SD*: 11.42; range: 21–65 years). Most participants were female ($N = 694$; 90%). A total of 610 (79.1%) respondents lived with their partner and 161 (20.9%) lived alone. A total of 451 (58.5%) of the participants had a fixed contract, 289 (37.5%) had a temporary contract, and 31 (4%) had another type of contract. On average, the number of years of professional experience was 17.09 (*SD*: 6.67; range: 1–43 years). The sociodemographic characteristics of participants are shown in Table 2.

4.2 | Means, standard deviations, and correlations among variables

Table 3 shows the mean and standard deviation for each of the variables in the study, and the correlations between these variables and 95% confidence intervals. The results confirm that there is discriminant validity since all correlations are lower than 0.68, below the threshold of 0.85 established by some authors as the cut-off point (Garson, 2016).

The results showed, as expected, that resources (autonomy, social support and material and human resources) correlate negatively with burnout while demands (role conflict, role ambiguity, and work overload) correlate positively with burnout. The perceived threat of COVID-19 positively correlates with burnout (0.68; $p < 0.01$). This correlation is the highest between burnout and the variables used to explain it.

Age and work experience correlated positively (0.92; $p < 0.01$). Previous studies have pointed out the multicollinearity that can arise when using both together as predictor variables (Cohen et al., 2003). For this reason, we will only include work experience as a predictor of burnout in subsequent analyses.

4.3 | Hierarchical linear regression analysis results

Results of the regression analyses can be seen in Table 4. In each of the models analysed, the value of the Durbin-Watson statistic takes values that are within the acceptable range (1.5–2.5). This means that there is no autocorrelation problem in the data. The condition index in all models is within the acceptable range (15–20). In all cases, the values of the variance inflation factor remained below the recommended maximum value of around 5. This means that there is no multicollinearity problem in the regression models used in this study.

The sociodemographic variables explained 5% of the variance. When the resource and demand variables were introduced, the increase in R^2 was 43.1%. The perceived threat of COVID-19 variable resulted in an increase in the explained variance of an additional 7.4%. The results also showed that autonomy, role conflict, and role ambiguity do not contribute to explaining burnout. In addition, only the social support \times perceived threat of COVID-19 interaction term was statistically significant in explaining burnout in the participants. To determine the magnitude of this relationship we drew the interaction at one *SD* above and below the mean of perceived threat of COVID-19 (Figure 1) and conducted simple slopes analyses.

From an analysis of Figure 1 it can be deduced that the influence of the perceived threat of COVID-19 on burnout is asymmetric: when the perceived threat of COVID-19 is equal to its mean value plus one standard deviation (perceived threat = mean + 1 *SD*), the burnout values, in terms of social support at work, are high (above the mean value of the scale) and differ little from the value found when the perceived threat takes its mean value. However, when the perceived threat of COVID-19 takes a value equal to the mean minus one standard deviation (perceived threat = mean – 1 *SD*), the burnout values, in terms of social support at work, are low (below the mean value of the scale) and deviate greatly from the value found when the perceived threat takes its mean value.

5 | DISCUSSION

The results confirmed that the perceived threat generated by COVID-19, coupled with the psychosocial factors of demand and resources in the work context, helps to explain burnout in nursing staff (Model 3). The regression coefficient of the perceived threat of COVID-19 ($\beta = .392$; $p < 0.001$) showed that this situational variable presents the highest explanatory power. This result is in line with previous studies that have shown that the level of perceived threat in pandemic situations can explain the burnout suffered by nursing staff (Lai et al., 2020; Shih et al., 2007; Stawicki et al., 2017).

Ong et al. (2019) proposed that the impact of resources and demands of work on burnout could be moderated in stressful situations. However, as far as we know, no previous work has studied the moderating role that perceived threat among nursing staff during a pandemic may have on the relation between resources and demands

TABLE 4 Hierarchical linear regression with beta coefficients (β), t-values, (t), 95% confidence intervals (CI), and p-values (p)

	Model 1			Model 2			Model 3			Model 4						
	β	t	CI	p	β	t	CI	p	β	t	CI	p				
G	0.017	0.474	(-0.064; 0.100)	0.636	0.021	0.798	(-0.036; 0.080)	0.425	0.042	1.735	(-0.008; 0.105)	0.083	0.045	1.843	(-0.008; 0.103)	0.066
MS	-0.035	-0.996	(-0.081; 0.031)	0.320	-0.031	-1.190	(-0.067; 0.020)	0.235	-0.031	-1.278	(-0.066; 0.017)	0.202	-0.036	-1.502	(-0.070; 0.009)	0.134
TC	-0.130	-2.683	(-0.123; -0.025)	0.007	-0.048	-1.337	(-0.070; 0.015)	0.182	-0.049	-1.455	(-0.063; 0.009)	0.146	-0.050	-1.499	(-0.069; 0.009)	0.134
PE	0.119	2.444	(0.001; 0.006)	0.015	0.071	1.938	(0.000; 0.004)	0.053	0.051	1.508	(-0.001; 0.003)	0.132	0.058	1.715	(0.001; 0.004)	0.087
RC					0.071	2.186	(-0.003; 0.068)	0.029	0.029	0.958	(-0.019; 0.048)	0.338	0.027	0.879	(-0.022; 0.045)	0.379
RA					0.038	1.280	(-0.013; 0.044)	0.201	0.032	1.167	(-0.012; 0.040)	0.243	0.032	1.149	(-0.013; 0.040)	0.251
WO					0.372	11.559	(0.165; 0.232)	<0.001	0.218	6.648	(0.077; 0.153)	<0.001	0.199	5.842	(0.070; 0.147)	<0.001
AU					-0.061	-2.154	(-0.058; -0.006)	0.032	-0.033	-1.255	(-0.044; 0.008)	0.210	-0.037	-1.396	(-0.044; 0.005)	0.163
SS					-0.238	-7.780	(-0.143; -0.077)	<0.001	-0.132	-4.405	(-0.092; -0.032)	<0.001	-0.153	-5.042	(-0.102; -0.041)	<0.001
MHR					-0.166	-5.795	(-0.103; -0.041)	<0.000	-0.115	-4.273	(-0.080; -0.021)	<0.001	-0.111	-4.087	(-0.079; -0.020)	<0.001
PTC								0.392	11.281	(0.104; 0.150)	<0.001	0.403	11.134	(0.108; 0.155)	<0.001	
RC × PTC												0.002	0.060	(-0.031; 0.035)	0.952	
RA × PTC												-0.025	-0.829	(-0.040; 0.035)	0.407	
WO × PTC												-0.035	-1.100	(-0.054; 0.015)	0.272	
AU × PTC												0.006	0.222	(-0.024; 0.028)	0.825	
SS × PTC												-0.110	-3.766	(-0.076; -0.022)	<0.001	
MHR × PTC												0.026	1.012	(-0.016; 0.038)	0.312	
R ²	0.054				0.485				0.559				0.568			
Adjusted R ²	0.049				0.474				0.553				0.558			
F value	10.92			<0.001	106.07			<0.001	127.272			<0.001	2.540			0.019

Abbreviations: A, age; AU, autonomy; B, burnout; G, gender; MHR, material and human resources; MS, marital status; PE, professional experience; PTC, perceived threat of Covid-19; RA, role ambiguity; RC, role conflict; SS, social support; TC, type of contract; WO, work overload.

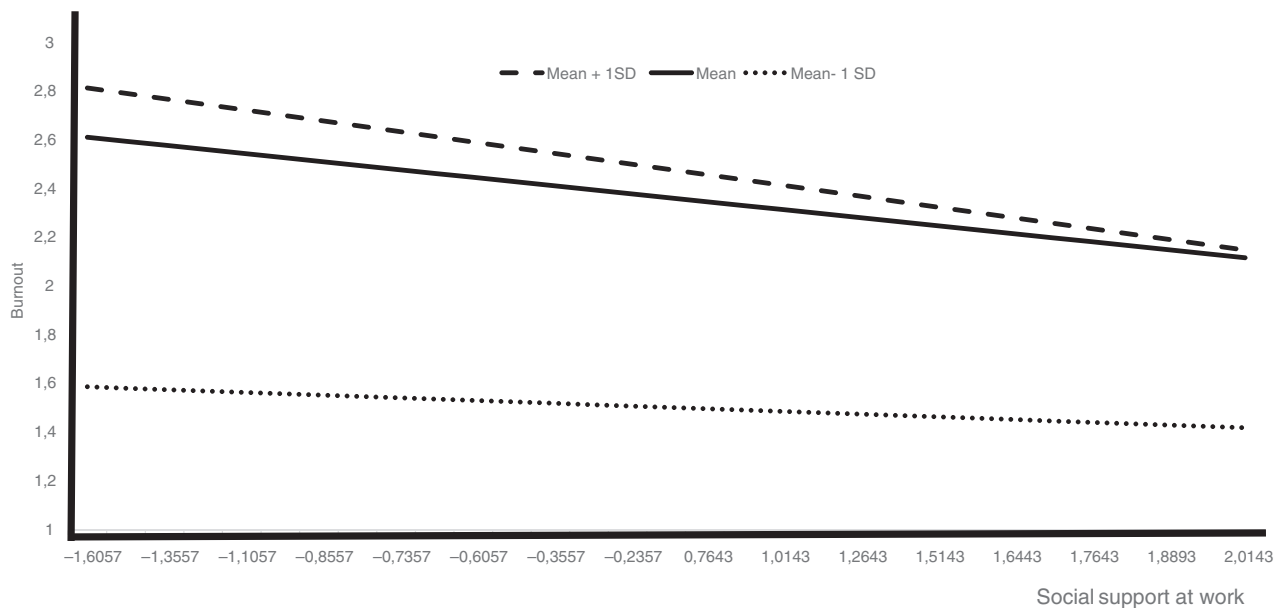


FIGURE 1 Relationship between social support at work and burnout

of work and burnout. Our results have shown that the perceived threat of COVID-19 behaves as a moderating variable in the relationship between social support at work and burnout. More specifically, the data have shown that the perceived threat of COVID-19 reinforces the negative relationship between social support at work and burnout. Thus, this finding is indicated in the proposal of Ong et al. (2019).

The nursing staff in our study presented unusually high average levels of autonomy ($mean = 2.11$) (Adebayo & Ezeanya, 2011). The results show that before the effect of the perceived threat of COVID-19 variable is considered (Model 2), autonomy helps explain the degree of nurse burnout ($\beta = -0.06$), as has been demonstrated in previous research (Adebayo & Ezeanya, 2011). However, when we introduced the perceived threat of COVID-19 variable (Model 3) into the model, autonomy ceased to be significant. This unique finding could be due to the quasi-collapse situation experienced by the Spanish Health System as a consequence of the high number of COVID-19 infections in hospitals. Unfortunately, as with previous pandemics (Cheong et al., 2007; Tzeng & Yin, 2006), hospitals became chaotic places at times, particularly in the emergency services, where nurses had to care for a large number of patients each shift, twice as many as they care for in a normal shift (Rascado Sedes et al., 2020). This forced nurses to be quick, to be vigilant in isolating anyone who appeared to be experiencing a respiratory illness and to multi-task to provide the patient with the necessary care and prevent the spread of the virus. This extreme and overloaded situation led nursing supervisors to allow a greater degree of autonomy in the execution of tasks (Buheji & Buhaid, 2020). However, it is possible that nurses did not attach much significance to this degree of autonomy, as they interpreted it as non-structural and therefore did not contribute to reducing their degree of burnout.

The behaviour of role conflict was similar to that of the autonomy variable. Before introducing the perceived threat of COVID-19 variable (Model 2), role conflict showed a significant β coefficient ($\beta = 0.07$). This variable lost its explanatory power when the perceived threat of COVID-19 was introduced (Model 3). This finding could also be a result of the exceptional situation where nurses had to carry out their work, due to the large number of people infected with COVID-19 who came to the hospitals every day. On the one hand, the hospital sent out messages about the great importance it attached to respect for protective practices to ensure the safety of all. In contrast, nurses were asked to work faster than usual, which contravened safe procedures and working methods. Furthermore, in this crisis situation nurses were faced with problems relating to hierarchically organizing the legitimate demands placed on them, or faced with a dilemma between doing everything to a lower quality of care or doing as much as they could while still complying with appropriate quality and safety levels (Yiwen et al., 2010). However, these conflicts seem to lose their importance in the face of a health emergency, where nurses' concern is to care for as many patients as possible in the shortest possible time.

5.1 | Limitations

As with all research, this work is not without limitations. Firstly, we used a convenience sample where 90% of the participants were women. However, as is the case in the rest of the world, women make up most of the nursing profession in Spain. Secondly, we used an online questionnaire to collect the data that had a response rate (39%) below that established by (Fincham, 2008), although it was on par with the average response rate of online questionnaires carried out by health-care staff in Spain (Aerny Perreten et al., 2012). Thirdly, our research's

cross-sectional design does not prove the causal relationships between variables. In the future, it would be interesting to carry out longitudinal studies that allow a better understanding of the causes and effects of the perceived threat in health crisis situations such as the one caused by COVID-19. Finally, we used a sample of nurses from a single country that worked in the three units most involved in nursing COVID-19 patients. It would be interesting to conduct similar research in other countries to determine whether our findings are replicated in different cultural settings. It would also be interesting to verify whether the results are maintained with samples of nurses that do not work with COVID-19 patients on the frontline. Despite these limitations, as far as we know, the present study is the first to investigate possible links between the health emergency caused by COVID-19 and burnout syndrome in a sample of nurses.

5.2 | Implications for practice

The present study has several significant implications. Hospital managers, concerned about burnout and its consequences on nursing staff, should implement strategies to ensure that health emergencies caused by viruses (e.g. COVID-19) are not perceived as a major threat. From both the pandemic caused by COVID-19 and previous pandemics, we have learnt that nurses should be considered to be persons at high risk of exposure and that institutions should act accordingly (Fernandez et al., 2020). Actions that could be taken include providing them with priority access to testing, personal protective equipment, treatments and vaccinations when available and providing them with sufficient time off to rest and care for loved ones who become ill (Koh et al., 2005; Nickell et al., 2004). On the other hand and perhaps more importantly, the organization should maintain clear, fluid, and regular communication with its nursing staff, which would help increase staff members' confidence and sense of control (Balicer et al., 2006; Corley et al., 2010).

Balicer et al. (2006) and Kahn et al. (2016) showed that one of the factors that can most significantly influence perceived threat amongst frontline workers is psychological support received during and after a pandemic. Training in emotional competencies among nurses could be very beneficial in maintaining good mental health in health emergency situations. This allows behaviour to focus on goals and values, here and now, to try to control and avoid negative emotions (Gutierrez & Ciampone, 2007) that lead to an increase in the perceived threat of COVID-19.

In addition, the development of full care in nursing teams that care for people affected by COVID-19 would be very desirable as this promotes emotional regulation, improves attention span, and strengthens mnemonic capacity (Restubog et al., 2020). In this sense, promoting mindfulness as a self-regulation strategy focusing on the here and now is highly recommended in situations such as the COVID-19 pandemic in Spain and the rest of the world and could lead nurses to have a reduced level of perceived threat of COVID-19 (Hedderman et al., 2020).

6 | CONCLUSIONS

Our results showed that, along with work overload, social support, and human material resources at work, the perceived threat of COVID-19 situational variable helped explain the degree of burnout suffered by nurses. In addition, the perceived threat of COVID-19 moderated the influence of social support at work on burnout.

ACKNOWLEDGEMENTS

We thank all the nurses who have voluntarily and selflessly participated in this study. We dedicate this article to them and applaud their efforts, fortitude, courage, and hard work. Bravo nurses!

CONFLICT OF INTEREST

No conflict of interest has been declared by the author(s).

AUTHOR CONTRIBUTIONS

GMG, JCAC: Study design. GMG, JCAC: Data collection. GMG, JCAC: Data analysis. GMG, JCAC: Study supervision. GMG, JCAC: Manuscript writing. GMG, JCAC: Critical revisions for important intellectual content.

PEER REVIEW

The peer review history for this article is available at <https://publons.com/publon/10.1111/jan.14642>.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Guadalupe Manzano García  <https://orcid.org/0000-0003-4546-0513>

Juan Carlos Ayala Calvo  <https://orcid.org/0000-0002-0883-2149>

REFERENCES

- Adebayo, S., & Ezeanya, I. (2011). Task identity and job autonomy as correlates of burnout among nurses in Jos, Nigeria. *International Review of Social Sciences and Humanities*, 2(1), 7–13.
- Aerny Perreten, N., Domínguez-Berjón, M. F., Astray Mochales, J., Esteban-Vasallo, M. D., Blanco Ancos, L. M., & López Pérez, M. Á. (2012). Tasas de respuesta a tres estudios de opinión realizados mediante cuestionarios en línea en el ámbito sanitario [Response rates to three opinion studies conducted using questionnaires online in healthcare]. *Gaceta Sanitaria*, 26(5), 477–479. <https://doi.org/10.1016/j.gaceta.2011.10.016>
- Alarcon, G. (2011). A meta-analysis of burnout with job demands, resources and attitudes. *Journal of Vocational Behavior*, 79(2), 549–562. <https://doi.org/10.1016/j.jvb.2011.03.007>
- Baeriswyl, S., Krause, A., & Schwaninger, A. (2016). Emotional exhaustion and job satisfaction in airport security officers – work-family conflict as mediator in the job demands-resources model. *Frontiers in Psychology*, 7, 663. <https://doi.org/10.3389/fpsyg.2016.00663>
- Bakker, A. B., & Demerouti, E. (2014). Job demands – Resources theory. In *Work and wellbeing* (Vol. III, pp. 37–64). Wiley-Blackwell. <https://doi.org/10.1002/9781118539415.wbwell019>

- Bakker, A. B., & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology, 22*(3), 273–285. <https://doi.org/10.1037/ocp0000056>
- Balicer, R. D., Omer, S. B., Barnett, D. J., & Everly, G. S. (2006). Local public health workers' perceptions toward responding to an influenza pandemic. *BMC Public Health, 6*(1), 99. <https://doi.org/10.1186/1471-2458-6-99>
- Bernardo, Á., Álvarez del Vayo, M., & Torrecilla, C. (2020). COVID-19 pandemic exposes southern Europe's nursing shortage. Civio, Retrieved from <https://civio.es/medicamentalia/2020/06/23/covid-19-pandemic-exposes-southern-europes-nursing-shortage/>
- Buheji, M., & Buhaid, N. (2020). Nursing human factor during COVID-19 pandemic. *International Journal of Nursing Science, 10*(1), 12–24. <https://doi.org/10.5923/j.nursing.20201001.02>
- Buheji, M., Jahrami, H., & Dhahi, A. S. (2020). Minimising stress exposure during pandemics similar to COVID-19. *International Journal of Psychology and Behavioral Sciences, 10*(1), 9–16. <https://doi.org/10.5923/j.ijpbs.20201001.02>
- Chen, Q., Liang, M., Li, Y., Guo, J., Fei, D., Wang, L., He, L., Sheng, C., Cai, Y., Li, X., Wang, J., & Zhang, Z. (2020). Mental health care for medical staff in China during the COVID-19 outbreak. *The Lancet Psychiatry, 7*(4), e15–e16. [https://doi.org/10.1016/S2215-0366\(20\)30078-X](https://doi.org/10.1016/S2215-0366(20)30078-X)
- Cheong, S. K., Wong, T. Y., Lee, H. Y., Fong, Y. T., Tan, B. Y., Koh, G. C., Chan, K. M., Chia, S. E., & Koh, D. (2007). Concerns and preparedness for an avian influenza pandemic: A comparison between community hospital and tertiary hospital healthcare workers. *Industrial Health, 45*(5), 653–661. <https://doi.org/10.2486/indhealth.45.653>
- CNDE. (2020). *National conference of nursing deans. Special COVID-19*. Retrieved from [https://www.google.com/search?q=Conferencia+Nacional+de+Decanos+de+Enfermería.+Especial+COVID-19+\(2\)](https://www.google.com/search?q=Conferencia+Nacional+de+Decanos+de+Enfermería.+Especial+COVID-19+(2))
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). Applied multiple regression/correlation analysis for the behavioral sciences. In *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.) Lawrence Erlbaum Associates Publishers. <https://doi.org/10.4324/9780203774441>
- Corley, A., Hammond, N. E., & Fraser, J. F. (2010). The experiences of health care workers employed in an Australian intensive care unit during the H1N1 Influenza pandemic of 2009: A phenomenological study. *International Journal of Nursing Studies, 47*(5), 577–585. <https://doi.org/10.1016/j.ijnurstu.2009.11.015>
- Demerouti, E., & Bakker, A. (2011). The job demands-resources model: challenges for future research. *IEEE Electrical Insulation Magazine, 37*(2), 1–9. <https://doi.org/10.4102/sajip.v37i2.974>
- Epp, K. (2012). Burnout in critical care nurses: A literature review. *Dynamics, 23*(4), 25–31. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/23342935/>
- Farrerons-Nogueras, L., & Calvo-Francés, F. (2008). Estudio descriptivo del síndrome de burnout en una muestra de profesionales de enfermería en el área sur de Gran Canaria. *Ansiedad y Estrés, 14*, 101–113. Retrieved from <http://dialnet.unirioja.es/servlet/articulo?codigo=2684331>
- Fernandez, P. R., Lord, H., Halcomb, P. E., Moxham, P. L., Middleton, D. R., Alananzeh, D. I., & Ellwood, L. (2020). Implications for COVID-19: A systematic review of nurses' experiences of working in acute care hospital settings during a respiratory pandemic. *International Journal of Nursing Studies, 103*637. <https://doi.org/10.1016/j.ijnurstu.2020.103637>
- Fincham, J. E. (2008). Response rates and responsiveness for surveys, standards and the Journal. *American Journal of Pharmaceutical Education, 72*(2), 43. <https://doi.org/10.5688/aj720243>
- Garson, G. D. (2016). *Validity & reliability (Statistica)*. Statistical Associates Publishing. Retrieved from <http://www.statisticalassociates.com/validityandreliability.p.pdf>
- Gil-Monte, P. (2005). El síndrome de quemarse por el trabajo (burnout). Una enfermedad laboral en la sociedad del bienestar [The syndrome of being burned by work (burnout). An occupational disease in the welfare society]. *Pirámide*. <https://doi.org/10.13140/2.1.4614.8806>
- Gil-Monte, P. (2016a). The UNIPISICO questionnaire: Psychometric properties of the scales measuring psychosocial demands. *Archivos de Prevención de Riesgos Laborales, 19*(2), 86–94. <https://doi.org/10.12961/apr.2016.19.02.2>
- Gil-Monte, P. (2016b). The UNIPISICO questionnaire: Psychometric properties of the scales measuring psychosocial resource factors. *Archivos de Prevención de Riesgos Laborales, 19*(2), 95–102. <https://doi.org/10.12961/apr.2016.19.02.3>
- Gil-Monte, P. (2019). *CESQT. Cuestionario para la evaluación del síndrome de quemarse por el trabajo*. Manual [Questionnaire for the evaluation of burnout syndrome from work. Handbook]. Madrid: TEA. <https://doi.org/10.13140/RG.2.1.5008.0969/1>
- Gutierrez, B. A. O., & Ciampone, M. H. T. (2007). O processo de morrer e a morte no enfoque dos profissionais de enfermagem de UTIs. *Revista Da Escola De Enfermagem Da USP, 41*(4), 660–667. <https://doi.org/10.1590/S0080-62342007000400017>
- Hair, J., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling*. London: Sage Publication.
- Hedderman, E., O'Doherty, V., & O'Connor, S. (2020). Mindfulness moments for clinicians in the midst of a pandemic. *Irish Journal of Psychological Medicine, 1–4*. <https://doi.org/10.1017/ipm.2020.59>
- Heijden, B., Peeters, M. C. W., Blanc, P. M., & Breukelen, J. (2018). Job characteristics and experience as predictors of occupational turnover intention and occupational turnover in the European nursing sector. *Journal of Vocational Behavior, 108*, 108–120. <https://doi.org/10.1016/j.jvb.2018.06.008>
- IBM Corp. (2013). *IBM SPSS statistics for windows, version 26.0*. Armonk, NY: IBM Corp.
- Imai, T., Takahashi, K., Hasegawa, N., Lim, M.-K., & Koh, D. (2005). SARS risk perceptions in healthcare workers, Japan. *Emerging Infectious Diseases, 11*(3), 404–410. <https://doi.org/10.3201/eid1103.040631>
- Inchausti, F., García-Poveda, N. V., Prado-Abril, J., & Sánchez-Reales, S. (2020). La Psicología Clínica ante la Pandemia COVID-19 en España. *Clínica y Salud, 31*(2), 105–107. <https://doi.org/10.5093/clysa.2020a11>
- Ives, J., Greenfield, S., Parry, J. M., Draper, H., Gratus, C., Petts, J. I., Sorell, T., & Wilson, S. (2009). Healthcare workers' attitudes to working during pandemic influenza: A qualitative study. *BMC Public Health, 9*(1), 56. <https://doi.org/10.1186/1471-2458-9-56>
- Kahn, D. M., Bulanda, J. J., Weissberger, A., Jalloh, S., Villa, E. V., & Williams, A. (2016). Evaluation of a support group for Ebola hotline workers in Sierra Leone. *International Journal of Culture and Mental Health, 9*(2), 164–171. <https://doi.org/10.1080/17542863.2016.1153121>
- Khamisa, N., Peltzer, K., & Oldenburg, B. (2013). Burnout in relation to specific contributing factors and health outcomes among nurses: A systematic review. *International Journal of Environmental Research and Public Health, 10*(6), 2214–2240. <https://doi.org/10.3390/ijerph1006.2214>
- Kim, S., & Wang, J. (2018). The role of job demands–resources (JDR) between service workers' emotional labor and burnout: new directions for labor policy at local government. *International Journal of Environmental Research and Public Health, 15*(12), 2894. <https://doi.org/10.3390/ijerph15122894>
- Koh, D., Lim, M. K., Chia, S. E., Ko, S. M., Qian, F., Ng, V., Tan, B. H., Wong, K. S., Chew, W. M., Tang, H. K., Ng, W., Muttakin, Z., Emmanuel, S., Fong, N. P., Koh, G., Kwa, C. T., Tan, K.-B.-C., & Fones, C. (2005). Risk perception and impact of Severe Acute Respiratory Syndrome (SARS) on work and personal lives of healthcare workers in Singapore. *Medical Care, 43*(7), 676–682. <https://doi.org/10.1097/O1.mlr.00001.67181.36730.cc>
- Koh, Y., Hegney, D., & Drury, V. (2012). Nurses' perceptions of risk from emerging respiratory infectious diseases: A Singapore study.

- International Journal of Nursing Practice*, 18(2), 195–204. <https://doi.org/10.1111/j.1440-172X.2012.02018.x>
- Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., Wu, J., Du, H., Chen, T., Li, R., Tan, H., Kang, L., Yao, L., Huang, M., Wang, H., Wang, G., Liu, Z., & Hu, S. (2020). Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Network Open*, 3(3), e203976. <https://doi.org/10.1001/jamanetworkopen.2020.3976>
- Lam, K., & Hung, S. Y. M. (2013). Perceptions of emergency nurses during the human swine influenza outbreak: A qualitative study. *International Emergency Nursing*, 21(4), 240–246. <https://doi.org/10.1016/j.ienj.2012.08.008>
- Lam, S. K. K., Kwong, E. W. Y., Hung, M. S. Y., & Chien, W. T. (2020). Emergency nurses' perceptions regarding the risks appraisal of the threat of the emerging infectious disease situation in emergency departments. *International Journal of Qualitative Studies on Health and Well-Being*, 15(1), e1718468. <https://doi.org/10.1080/17482631.2020.1718468>
- Leiter, M., & Maslach, C. (2004). Areas of worklife: A structured approach to organizational predictors of job burnout. *Research in Occupational Stress and Well-Being*, 3, 91–134. [https://doi.org/10.1016/S1479-3555\(03\)03003-8](https://doi.org/10.1016/S1479-3555(03)03003-8)
- Manzano-García, G., Montañés, P., & Megías, J. L. (2017). Perception of economic crisis among Spanish nursing students: Its relation to burnout and engagement. *Nurse Education Today*, 52, 116–120. <https://doi.org/10.1016/j.nedt.2017.02.020>
- Maslach, C., Schaufeli, W., & Leiter, M. (2001). Job Burnout. *Annual Review of Psychology*, 52(16), 397–422. <https://doi.org/10.1146/annurev.psych.52.1.397>
- Montgomery, A., Spânu, F., Băban, A., & Panagopoulou, E. (2015). Job demands, burnout and engagement among nurses: A multi-level analysis of ORCAB data investigating the moderating effect of teamwork. *Burnout Research*, 2(2–3), 71–79. <https://doi.org/10.1016/j.burn.2015.06.001>
- Nickell, L. A., Crighton, E. J., Tracy, C. S., Al-Enazy, H., Bolaji, Y., Hanjrah, S., Hussain, A., Makhlof, S., & Upshur, R. E. G. (2004). Psychosocial effects of SARS on hospital staff: Survey of a large tertiary care institution. *Canadian Medical Association Journal*, 170(5), 793–798. <https://doi.org/10.1503/cmaj.1031077>
- Nunnally, J., & Bernstein, I. (1994). *Psychometric theory*. New York: McGraw-Hill. Retrieved from https://kupdf.net/download/nunnally-bernstein-psychometric-theory-3ed-1994_58ed3368dc0d60536bda97f3_pdf
- Ong, N., Hao, C., & Zhao, J. H. (2019). Demographic, personal and situational variables associated with burnout in Singaporean coaches. *Sports Coaching Review*, 8(3), 262–284. <https://doi.org/10.1080/21640629.2018.1521625>
- Paladino, L., Sharpe, R. P., Galwankar, S. C., Sholevar, F., Marchionni, C., Papadimos, T. J., Paul, E., Hansoti, B., Firstenberg, M., Garg, M., Watson, M., Baxter, R. A., & Stawicki, S. P. (2017). Reflections on the ebola public health emergency of international concern, part 2: The unseen epidemic of posttraumatic stress among health-care personnel and survivors of the 2014–2016 ebola outbreak. *Journal of Global Infectious Diseases*, 9(2), 45–50. https://doi.org/10.4103/jgid.jgid_24_17
- Rascado Sedes, P., Ballesteros Sanz, M. A., Bodí Saera, M. A., Carrasco Rodríguez-Rey, L. F., Castellanos Ortega, A., Catalán González, M., de Haro López, C., Díaz Santos, E., Escriba Barcena, A., Frade Mera, M. J., Igeño Cano, J. C., Martín Delgado, M. C., Martínez Estalella, G., Raimondi, N., Roca i Gas, O., Rodríguez Oviedo, A., Romero San Pío, E., & Trenado Álvarez, J. (2020). Contingency plan for intensive care services against the covid-19 pandemic. *Medicina Intensiva*, 44(2), 363–370. <https://doi.org/10.1016/j.medin.2020.03.006>
- Restubog, S. L. D., Ocampo, A. C. G., & Wang, L. (2020). Taking control amidst the chaos: Emotion regulation during the COVID-19 pandemic. *Journal of Vocational Behavior*, 119, 1–6. <https://doi.org/10.1016/j.jvb.2020.103440>
- Rodríguez Carvajal, R., & de Rivas Herмосilla, S. (2011). Los procesos de estrés laboral y desgaste profesional (burnout): diferenciación, actualización y líneas de intervención [The processes of work stress and professional burnout: Differentiation, updating and lines of intervention]. *Medicina y Seguridad Del Trabajo*, 57(1), 72–88. <https://doi.org/10.4321/s0465-546x2011000500006>
- SATSE Nursing Union. (2020). Retrieved from <https://www.majorcadailybulletin.com/news/local/2020/02/10/62485/nursing-union-wanting-coronavirus-urgent-meetings.html>
- Shih, F.-J., Gau, M.-L., Kao, C.-C., Yang, C.-Y., Lin, Y.-S., Liao, Y.-C., & Sheu, S.-J. (2007). Dying and caring on the edge: Taiwan's surviving nurses' reflections on taking care of patients with severe acute respiratory syndrome. *Applied Nursing Research*, 20(4), 171–180. <https://doi.org/10.1016/j.apnr.2006.08.007>
- Spanish Ministry of Health. (2020). Retrieved from https://www.mschs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov/documentos/Actualizacion_79_COVID-19.pdf
- Stawicki, S. P., Sharpe, R. P., Galwankar, S. C., Sweeney, J., Martins, N., Papadimos, T. J., Jeanmonod, D., Firstenberg, M. S., Paladino, L., Hansoti, B., & Garg, M. (2017). Reflections on the ebola public health emergency of international concern, part 1: Post-ebola syndrome: The silent outbreak. *Journal of Global Infectious Diseases*, 9(2), 41–44. https://doi.org/10.4103/jgid.jgid_20_17
- Tzeng, H.-M. (2004). Nurses' professional care obligation and their attitudes towards SARS infection control measures in Taiwan during and after the 2003 epidemic. *Nursing Ethics*, 11(3), 277–289. <https://doi.org/10.1191/096733004ne6950a>
- Tzeng, H.-M., & Yin, C.-Y. (2006). Nurses' fears and professional obligations concerning possible human-to-Human Avian Flu. *Nursing Ethics*, 13(5), 455–470. <https://doi.org/10.1191/096733006nej8930a>
- World Health Organization. (2020). *Coronavirus disease (COVID-19)*. Retrieved from <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/>
- Xanthopoulou, D., Demerouti, E., & Schaufeli, W. (2007). The role of personal resources in the job demands-resources model. *International Journal of Stress Management*, 14(2), 121–141. <https://doi.org/10.1037/1072-5245.14.2.121>
- Yiwen, K., Hegney, D., & Drury, V. (2010). A comprehensive systematic review of healthcare workers' perceptions of risk from exposure to emerging acute respiratory infectious diseases and the perceived effectiveness of strategies used to facilitate healthy coping in acute hospital and community he. *JBI Library of Systematic Reviews*, 8(23), 917–971. <https://doi.org/10.11124/jbisrir-2010-150>
- Zhao, G. (2020). Taking preventive measures immediately: Evidence from China on COVID-19. *Gaceta Sanitaria*, 34(3), 217–219. <https://doi.org/10.1016/j.gaceta.2020.03.002>

How to cite this article: Manzano García G, Ayala Calvo J. The threat of COVID-19 and its influence on nursing staff burnout. *J Adv Nurs*. 2021;77:832–844. <https://doi.org/10.1111/jan.14642>

The *Journal of Advanced Nursing (JAN)* is an international, peer-reviewed, scientific journal. *JAN* contributes to the advancement of evidence-based nursing, midwifery and health care by disseminating high quality research and scholarship of contemporary relevance and with potential to advance knowledge for practice, education, management or policy. *JAN* publishes research reviews, original research reports and methodological and theoretical papers.

For further information, please visit *JAN* on the Wiley Online Library website: www.wileyonlinelibrary.com/journal/jan

Reasons to publish your work in *JAN*:

- **High-impact forum:** the world's most cited nursing journal, with an Impact Factor of 1.998 – ranked 12/114 in the 2016 ISI Journal Citation Reports © (Nursing (Social Science)).
- **Most read nursing journal in the world:** over 3 million articles downloaded online per year and accessible in over 10,000 libraries worldwide (including over 3,500 in developing countries with free or low cost access).
- **Fast and easy online submission:** online submission at <http://mc.manuscriptcentral.com/jan>.
- **Positive publishing experience:** rapid double-blind peer review with constructive feedback.
- **Rapid online publication in five weeks:** average time from final manuscript arriving in production to online publication.
- **Online Open:** the option to pay to make your article freely and openly accessible to non-subscribers upon publication on Wiley Online Library, as well as the option to deposit the article in your own or your funding agency's preferred archive (e.g. PubMed).