How to Cite:
Almulihi, Q. A. A., Almulihi, F. A. A., Alobaidan, S. khalid S., Alsultan, S. K. A., Alsultan, D. A. H., & Alsultan, Y. M. H. (2022). Gender-based differences in burnout during the COVID-19 pandemic: Are female nurses more prone to burnout than males? A meta-analysis. *International Journal of Health Sciences*, *6*(S4), 2061–2073.
https://doi.org/10.53730/ijhs.v6nS4.6557

Gender-based Differences in Burnout during the COVID-19 Pandemic: Are Female Nurses More Prone to Burnout than Males? A Meta-analysis

Qasem Ahmed Ali Almulihi
Master of Science in medicine Maastricht University the Netherlands | Emergency Resident -King Fahad University Hospital Al Khobar - Kingdom of Saudi Arabia,.
ORCID ID 0000-0001-6341-0910
Corresponding author email: Qasem.almulihi@hotmail.com

Fatimah Ahmed Ali Almulihi
Bachelor of Nursing - King Faisal University - Kingdom of Saudi Arabia | Registered nurse at Alomran General Hospital - Kingdom of Saudi Arabia,

Sara Khalid Saad Alobaidan
Bachelor of Nursing - King Saud bin Abdulaziz University for Health Sciences (KSAU-HS) | Registered nurse at Prince Saud Bin Jalawy Hospital - Kingdom of Saudi Arabia

Sarah Khalid Abdullah Alsultan
Bachelor of Nursing - King Saud bin Abdulaziz University for Health Sciences (KSAU-HS) | Case Manager Staff Nurse 1 - King Abdulaziz Hospital (NGHA) Kingdom of Saudi Arabia

Dalal Abdulrahman Hussein Alsultan
Master of Science in Nursing at King Faisal University in Alahsa

Yaser Mohammed Hussain Alsultan
Master of science in medicine Maastricht University the Netherlands

***Abstract*---**The aim was to investigate the gender-based difference in burnout of nurses during the Covid-19 pandemic. Successful and valuable strategies can be designed to improve nurses' well-being and to identify, treat, and prevent burnout by recognizing gender-related differences. A systemic search was conducted from electronic databases (PubMed/Medline, Cochrane Library, and Google Scholar) from the inception to 12th FEB 2022. All statistical analyses were conducted in Review Manager 5.4.1. Studies meeting inclusion criteria were selected. A random-effect model was used when heterogeneity was observed to pool the studies, and the results were reported via the standard mean difference (SMD) and corresponding 95% confidence interval (CI). Six cross-sectional studies were selected for meta-analysis. There was significant SMD for burnout in males compared with in females (SMD= −0.10 [−0.20, −0.00]; p= 0.04; I2= 84%). The results of the meta-analysis suggested that the overall burnout rate was more significant in male nurses than in female nurses during the COVID-19 pandemic. There was no difference in emotional exhaustion or personal achievement in both genders. The depersonalization score was more significant in males.

***Keywords*---**nurses, COVID-19, burnout, female, male.

Introduction

An outbreak of a novel coronavirus (COVID-19) occurred in Wuhan after 31 December 2019 [1]. This virus is a communicable disease and has caused havoc all over the world, and deaths are increasing day by day [2]. To date (26th October 2021), there have been 243,572,402 confirmed cases according to the World Health Organization (WHO) [3]. Because of the high death count, it is clear how much burden this pandemic has caused on the world healthcare system and has increased the workload of healthcare workers [4]. Burnout, which is defined as "psychological syndrome characterized by emotional exhaustion, depersonalization and a sense of reduced accomplishment in day-to-day work" [5] was a big mental health problem among nurses long before the pandemic dominated every conversation. However, COVID-19 has made being a front-line nurse much more difficult. While fighting this critical situation, burnout is a risk for both male and female front-line nurses who are involved in the diagnosis, treatment, and care of COVID-19 patients. Castaldelli-Maia et al. has shown the overall mental health effect of COVID-19 in the world. Nurses and other allied staff have been the backbone of the healthcare system, and Soto-Rubio et al. has shown that there is significant risk ($p< 0.0001$) of psychosocial and emotional instability in nurses [6].

Sex and gender differences in mental disorders are among the most intriguing and consistent findings in psychiatry. Many research studies have shown strong evidence that gender-based differences play a vital role to the higher prevalence of depression, anxiety, and burnout in females compared to that in males. After looking at how this pandemic has affected nurses generally, we should look into which gender is most vulnerable to emotional and mental vulnerability. Fuente et

al. previously observed the correlation between gender and depersonalization in nurses (r = 0.078) [7]. It is generally known that females are more prone to burnout compared to males [8]. The abovementioned result shows that gender has an independent role when burnout is observed in nurses. Giorgi et al. conducted a narrative review regarding mental health in the healthcare space of COVID-19, but they did not focus on the gender disparity that occurs in the workspace [9]. Another study by Rahman et al. focused on neurological and psychological effects of COVID-19 on the general population [10]. A recent meta-analysis was conducted discussing fatigue in oncology nurses, but it did not discuss the overall dynamics of the occupation [11]. We thus conducted a novel study to discuss the gender-based difference in nurses regarding burnout during this period of the pandemic. We aimed to formulate a compass that would focus on specific genders that undergo burnout so that a more efficient system with reduced burnout is established in society and to determine if female nurses are prone to burnout more than male nurses.

Methods

Data sources and search strategy

This systematic review and meta-analysis was conducted according to the Preferred Reporting Items for Systematic Review and Meta-analyses (PRISMA) guidelines [12]. An electronic search of PubMed/Medline, Cochrane Library, and Google Scholar was conducted from their inception to 12nd FEB 2022 with only English language-based literature using the search string: (gender OR sex OR male OR female) AND (nurse OR attendant) AND (Covid*) AND (burnout OR exhaustion OR weariness OR fatigue). In addition, we manually screened the cited articles of previous meta-analyses, cohort studies, and review articles to identify any relevant studies.

Study selection

All studies were included if they met the following eligibility criteria: (a) articles on nurses practicing in the COVID-19 pandemic; (b) burnout described based on gender; (c) burnout measured by a preformed questionnaire; and (d) articles should have a defined number of male and female nurses. Furthermore, the strategy for research was PECOS: 1) P (population): nurses; 2) E (exposure): burnout in the COVID-19 pandemic; 3) C (control): none; 4) O (outcome): gender-based burnout difference in the COVID-19 pandemic; 5) S (Studies): cross-sectional studies, cohort studies, and human-based randomized controlled trials published in English only. Cohorts, case series, case reports, literature reviews, editorials, and studies not meeting the inclusion criteria were excluded.

Data extraction and quality assessment of studies

Two reviewers independently searched the electronic databases. Studies that were searched were exported to EndNote Reference Library software version 20.0.1 (Clarivate Analytics), and duplicates were screened and removed. Data extraction and quality assessment of included studies were performed simultaneously and independently by two reviewers. The Newcastle–Ottawa Scale (NOS) was used to

assess the quality of the cross-sectional studies. A NOS score of 1–5 was considered high risk for bias, 6–7 was moderate, and a score >7 was considered low risk of bias (details of scoring are provided in Table 1).

Table 1
Quality assessment of cross-sectional studies using the Newcastle–Ottawa scale

Studies	Selection (Maximum 5)				Comparability (Maximum 2)	Outcome (Maximum 3)		Total score
	Representativeness of the sample	Sample size	Non-respondents	Ascertainment of the exposure (risk factor)	Comparability of Cohorts on the Basis of the Design or Analysis	Assessment of the outcome	Statistical test	
Chen et al., 2020	0	1	0	2	2	1	1	7
Hu et al., 2020	0	1	1	2	2	1	1	8
Murat et al., 2020	0	1	0	2	2	1	1	7
Sayilan et al. 2020	0	1	1	2	2	1	1	8
Brera et al., 2021	0	1	0	2	2	1	1	7
Jiang et al., 2021	0	1	1	2	2	1	1	8

Statistical analysis

Review Manager (version 5.4.1; Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2020) was used for all statistical analyses. The data from studies were pooled using a random-effects model. Analysis of results was performed using the standard mean difference (SMD) with respective 95% confidence intervals (CI). The chi-square test was performed to assess any differences between the subgroups. Sensitivity analysis was performed to see if any individual study was driving the results and to implore reasons of high heterogeneity. As per Higgins et al., the scale for heterogeneity was considered as follows: I^2 = 25–60% – moderate; 50–90% – substantial; 75–100% – considerable heterogeneity, and $p < 0.1$ – significant heterogeneity [13]. A $p< 0.05$ was considered significant for all analyses.

Results

Literature search results

The initial search of the three electronic databases yielded 372 potential studies. After exclusions based on titles and abstracts, the full texts of 62 studies were

read for possible inclusion. A total of 6 studies remained for quantitative analysis. Figure 1 summarizes the results of our literature search.

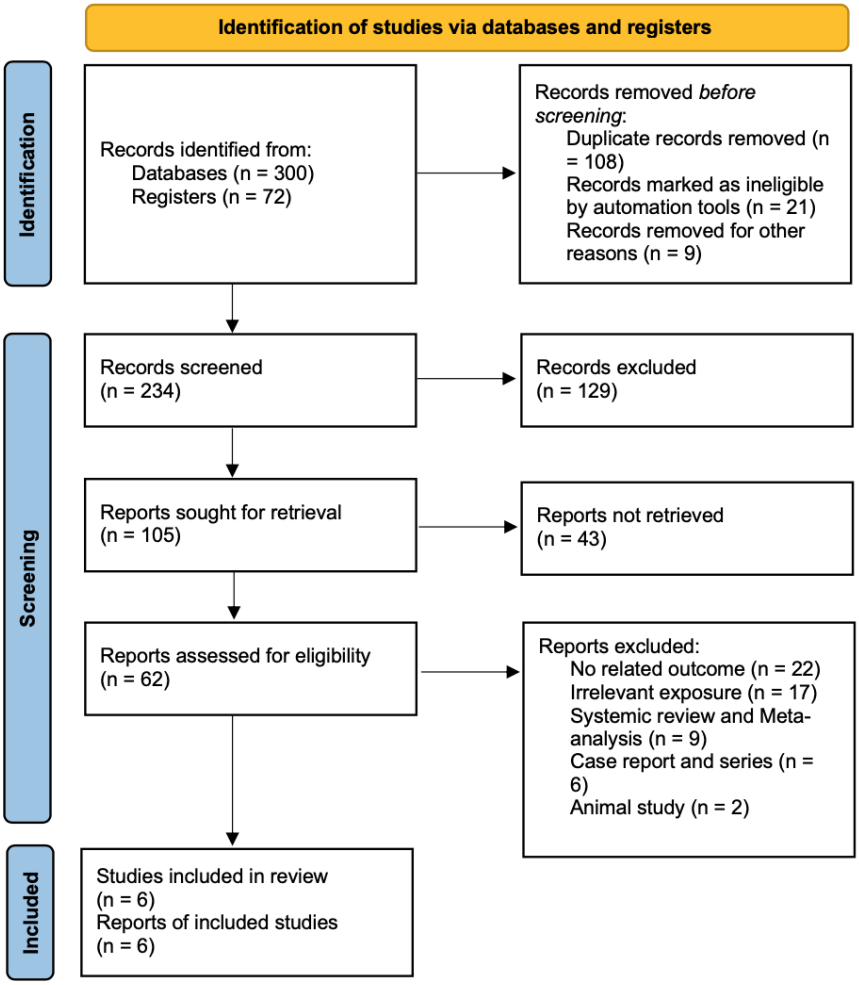

Figure 1. PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only

Study characteristics

Table 1 provides the basic characteristics of the included studies [14-19]. Our analysis included 6 published studies. All were cross-sectional studies. In total, 1633 nurses were involved in this analysis. Three studies were from China, two were from Turkey, and one was from Italy. The average age from these studies was 32.02 years. Four studies used the Maslach Burnout Inventory (MBI), one used the Chinese version of MBI i.e., Human Services Survey (MBI-HSS) for medical personnel, and another one used the professional quality of Life Scale Version 5.

Table 2
Basic characteristics of selected studies

Study	Year	Study design	Duration	Country	Total Nurses (n)	Male (n)	Female (n)	Mean Age (years)	Scale Used	NOS score
Chen et al	2020	Cross-sectional	April 2020	China and Taiwan	12596	555	12,041	33.1	Maslach Burnout Inventory	7
Hu et al	2020	Cross-sectional	February 2020	China	2014	260	1,754	30.99	Human Services Survey (MBI-HSS) for Medical Personnel	8
Murat et al	2020	Cross-sectional	May-July 2020	Turkey	705	148	557	27.9	Maslach Burnout Inventory	7
Sayilan et al	2020	Cross-sectional	May 10-20, 2020	Turkey	267	66	201	28.03	Maslach Burnout Inventory	8
Brera et al	2021	Cross-sectional	April-May 2020	Italy	532	133	399	40.95	Maslach Burnout Inventory	7
Jiang et al	2021	Cross-sectional	March-April 2020	China	219	43	176	31.17	Professional quality of Life Scale version 5	8

Publication bias and quality assessment

As the studies included less than 10, publication bias could not be assessed. Three studies have a low risk of bias [15, 17-18], while the other three have a moderate risk of bias [14, 16, 19].

Results of the meta-analysis

A detailed forest plot (Figure 2), outlining the effect size of burnout in nurses (based on gender) during the COVID-19 pandemic is provided. Six studies were used to conduct the analysis. The female group included 15,128 nurses, while the male group included 1,205 nurses. Analysis was done by subgrouping emotional exhaustion (EE), depersonalization (DP), lack of personal achievement (PA), and miscellaneous. There was a statistically non-significant SMD in EE (SMD= 0.04 [−0.12, 0.21]; p= 0.61; I^2= 82%) and in PA (MD= −0.03 [−0.12, 0.06]; p= 0.54; I^2= 45%), but there was a statistically significant SMD in DP (SMD= −0.21 [−0.33, −0.08]; p= 0.0010; I^2= 67%) and in miscellaneous (SMD= −0.69 [−1.03, −0.35]; p< 0.0001; I^2= not applicable). Thus, the overall effect of burnout based on gender in nurses during COVID-19 showed a statistically significant SMD (SMD= −0.10 [−0.20, −0.00]; p= 0.04; I^2= 84%).

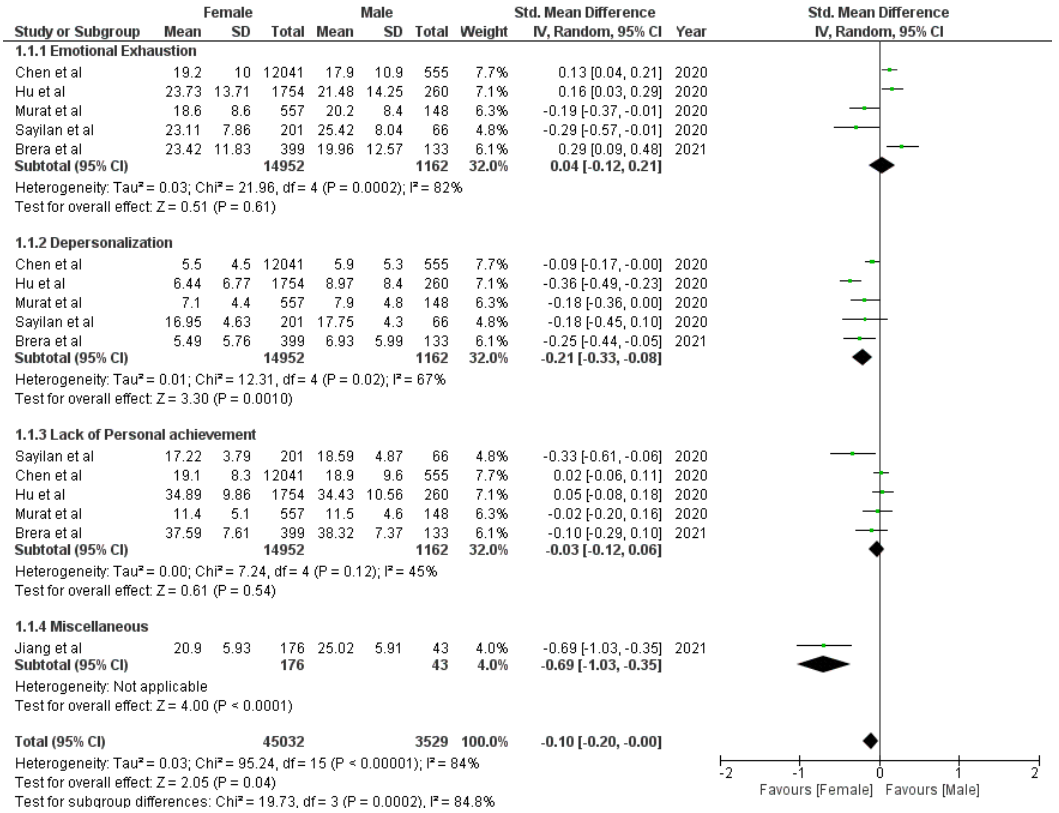

Figure 2. Forest plot showing effect size of burnout based on gender

Sensitivity analysis

A sensitivity analysis was conducted to assess the influence of each study on the overall effect by excluding one study at a time, followed by the generation of a pooled SMD for the remaining studies. No significant change was observed after the exclusion of any individual study, suggesting the results were robust.

Discussion

COVID-19 has become a heavy burden on the healthcare care system, affecting the lives of healthcare workers (HCWs) [20]. Dimitriu et al. evaluated the burnout among medical residents in Romania, where the virus placed a particularly heavy burden on residents [21]. Burnout syndrome can be defined as a state of physical and mental exhaustion related to workload or caregiving activity [22]. Wu et al. concluded that the COVID-19 frontline HCWs had a low frequency of burnout in comparison to HCWs in typical wards. They also found that gender had no impact on emotional burnout [23]. However, another study from China found that women and nurses had higher burnout levels, and frontline HCWs engaged in the direct care of patients with COVID-19 were associated with burnout symptoms [24].

Considering the inconsistent results of the previously published studies, we evaluated the impact of gender on burnout symptoms among nurses during the

global pandemic. The results of the meta-analysis showed that male nurses were more prone to have burnout symptoms than female nurses. No significant difference in emotional burnout or lack of personal achievements was found. Significant depersonalization feelings were reported in male nurses.

Maslach et al. described three dimensions of burnout; emotional exhaustion, depersonalization, reduced personal accomplishment, and commitment to the profession [25]. No significant effect of gender on personal achievement was found. Reduced personal achievement is a feeling of not accomplishing anything worthwhile at work, leading to a lack of motivation and poor performance [22]. Sayilan et al. reported significantly low personal achievement among male nurses [15]. However, four other studies reporting data on personal achievement showed no significant influence in terms of gender [14, 16-17, 19]. Sayilan et al. found that the difference in the results among the studies might have been derived from variations in working conditions [15].

Depersonalization is widely defined as the development of uncaring and callous feelings towards patients and others [22]. Chen et al. and Sayilan et al. found insignificant depersonalization among male nurses compared to that among female nurses [14-15]. Similar insignificant results were reported by Murat et al. [19]. Hu et al. and Brera et al. reported significant depersonalization among male nurses [16-17]. The results of the meta-analysis showed significant depersonalization among male nurses compared to that among female nurses. Brera et al. explained the reason for sex-related differences. They described that in male HCWs, resilience is a risk factor for depersonalization. In female HCWs, the job demands act as a protective factor, concluding that an excellent perception of job demand was associated with less depersonalization [16].

Emotional exhaustion is widely defined as a feeling of being mentally exhausted because of work-related stress [22]. Chen et al. concluded that female nurses working in ICUs that were COVID-19 designated and in departments involved with COVID-19 patients had a higher score in mental health outcomes [14]. Hu et al. also found higher mental health scores in female nurses in China [17]. Brera et al. found an overall equivalent burnout rate among male and female nurses during the first wave of COVID-19 outbreak in Italy; however, the emotional exhaustion score was higher in female HCWs [16]. Sayilan et al. found significantly higher emotional exhaustion and personal achievement scores in male nurses compared to those in female nurses in Turkey [15]. Similar results were reported by another Turkish study by Murat et al. [19]. However, the results of the meta-analysis showed insignificant differences among male and female nurses concerning emotional exhaustion.

The included studies reported data from early 2020. As of June 2020, approximately 500,000 cases were reported in Turkey in comparison to approximately 240,000 cases in Italy and 83,300 cases in China. However, the total death reported in Italy was approximate 34,500, whereas there were 4634 deaths in China and 5000 deaths in Turkey [26-28]. Indolfi et al. found that the healthcare system in Italy was unprepared [29]. The unprepared healthcare system and increased death rate might explain the emotional exhaustion among HCWs, which was more pronounced in female HCWs in Italy. Similar conditions

were reported in late 2019 and in early 2020 in China [27]. However, relatively better conditions were observed in Turkey [28]. Hwang et al. found that social relations are considered more important for women than for men, and social distancing has been more detrimental to women, resulting in higher emotional exhaustion among women [29].

Pablo et al., with a meta-analysis, reported various impacts of COVID-19 on the mental health of HCWs, predominantly insomnia, psychological distress, anxiety, and burnout [30]. Galanis et al. reported that burnout among nurses is a crucial issue during the global pandemic, and there is a need to prepare them to cope better with the condition [31]. A meta-analysis by Batra et al. found high anxiety and depression among female HCWs, nurses, and frontline workers than among males, doctors, and second-line workers [32]. Therefore, we present a meta-analysis that evaluated the influence of gender on burnout syndrome and its symptoms in nurses during COVID-19. Jiang et al., in their survey, found that overall burnout was more pronounced in males than in females [18]. The variation in workload among different countries might result in different levels of emotional exhaustion and burnout. Therefore, our results suggest that the hypothesis suggesting females experience burnout more than male nurses is not consistent; our results showed more burnout in male nurses during COVID-19, with more significant depersonalization, equivalent emotional burnout, and reduced personal achievements.

Limitation

Our study is limited in several ways. First, a minimal number of studies were used for analysis. Second, all studies were conducted during the initial period of the pandemic, so it does not give a present overview. Finally, high heterogeneity was observed in the analysis. These studies were pivotal in forming analysis, but more studies should be conducted.

Conclusion

To our knowledge, this is the first paper that explored the gender differences in burnout among nurses during the pandemic of coronavirus disease 2019 (COVID-19), and the results of the meta-analysis suggested that the overall burnout rate was more significant in male nurses than in female nurses during the COVID-19 pandemic. There was no difference in emotional exhaustions and personal achievement in both genders. The depersonalization score was more significant in males. However, the burnout rate has not been constant throughout the global pandemic, and several factors, such as severity of disease, improper health care planning, and variation in workload, have influenced burnout severity among nurses.

Conflict of interest statement

No competing interests are declared by the authors of this article.

Source of funding

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

Ethical approval

Not needed

Authors contributions

QAA is the first author of this article, he defined the research question, searched for relevant data sources, extracted of relevant data, assessed the eligibility of the data, and did the meta statistical analysis . FAA , SKA , SKA , DAA and YMA contributed equally to the followings : Analyzed and combined the data as well as writing the manuscript. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Protocol registration

INPLASY2021100109 https://inplasy.com/inplasy-2021-10-0109/

References

1. Torales J, O'Higgins M, Castaldelli-Maia JM, Ventriglio A. The outbreak of COVID-19 coronavirus and its impact on global mental health. *Int J Soc Psychiatry*. 2020;66(4):317-320. doi:10.1177/0020764020915212
2. World Health Organization. 2021. Occupational safety and health in public health emergencies: a manual for protecting health workers and responders. [online] Available at: <https://www.who.int/occupational_health/publications/safety-health-public-health-emergencies/en/> [Accessed 24 November 2021].
3. Home. (n.d.). WHO | World Health Organization. https://www.who.int/
4. Shreffler J, Petrey J, Huecker M. The Impact of COVID-19 on Healthcare Worker Wellness: A Scoping Review. *West J Emerg Med*. 2020;21(5):1059-1066. Published 2020 Aug 17. doi:10.5811/westjem.2020.7.48684.
5. Maslach, C., Jackson, S. E., & Leiter, M. P. (1996). Maslach burnout inventory manual. Palo Alto, Calif: Consulting Psychologists Press.
6. Soto-Rubio A, Giménez-Espert MDC, Prado-Gascó V. Effect of Emotional Intelligence and Psychosocial Risks on Burnout, Job Satisfaction, and Nurses' Health during the COVID-19 Pandemic. *Int J Environ Res Public Health*. 2020;17(21):7998. Published 2020 Oct 30. doi:10.3390/ijerph17217998
7. Cañadas-De la Fuente GA, Ortega E, Ramirez-Baena L, De la Fuente-Solana EI, Vargas C, Gómez-Urquiza JL. Gender, Marital Status, and Children as Risk Factors for Burnout in Nurses: A Meta-Analytic Study. *Int J Environ Res Public Health*. 2018;15(10):2102. Published 2018 Sep 25. doi:10.3390/ijerph15102102
8. Maeusli M, Lee B, Miller S, et al. Horizontal Gene Transfer of Antibiotic Resistance from Acinetobacter baylyi to Escherichia coli on Lettuce and Subsequent Antibiotic Resistance Transmission to the Gut

Microbiome. *mSphere*. 2020;5(3):e00329-20. Published 2020 May 27. doi:10.1128/mSphere.00329-20
9. Giorgi G, Lecca LI, Alessio F, et al. COVID-19-Related Mental Health Effects in the Workplace: A Narrative Review. *Int J Environ Res Public Health*. 2020;17(21):7857. Published 2020 Oct 27. doi:10.3390/ijerph17217857
10. Rahman J, Muralidharan A, Quazi SJ, Saleem H, Khan S. Neurological and Psychological Effects of Coronavirus (COVID-19): An Overview of the Current Era Pandemic. Cureus. 2020;12(6):e8460. Published 2020 Jun 5. doi:10.7759/cureus.8460
11. Xie W, Wang J, Zhang Y, et al. The levels, prevalence and related factors of compassion fatigue among oncology nurses: a systematic review and meta-analysis. *J Clin Nurs*. 2021;30(5-6):615-632. doi:10.1111/jocn.15565
12. Hutton B, Salanti G, Caldwell DM, et al. The PRISMA extension statement for reporting of systematic reviews incorporating network meta-analyses of health care interventions: checklist and explanations. *Ann Intern Med*. 2015;162(11):777-784. doi:10.7326/M14-2385
13. Higgins JP, Thompson SG, Deeks JJ, Altman DG. Measuring inconsistency in meta-analyses. BMJ. 2003;327(7414):557-560. doi:10.1136/bmj.327.7414.557
14. . Chen, R., Sun, C., Chen, J. J., Jen, H. J., Kang, X. L., Kao, C. C., & Chou, K. R. (2021). A Large-Scale Survey on Trauma, Burnout, and Posttraumatic Growth among Nurses during the COVID-19 Pandemic. *International journal of mental health nursing*, *30*(1), 102–116. https://doi.org/10.1111/inm.12796
15. Aydin Sayilan, A., Kulakaç, N., & Uzun, S. (2021). Burnout levels and sleep quality of COVID-19 heroes. *Perspectives in psychiatric care*, *57*(3), 1231–1236. https://doi.org/10.1111/ppc.12678
16. Brera, A. S., Arrigoni, C., Dellafiore, F., Odone, A., Magon, A., Nania, T., Pittella, F., Palamenghi, L., Barello, S., & Caruso, R. (2021). Burnout syndrome and its determinants among healthcare workers during the first wave of the Covid-19 outbreak in Italy: a cross-sectional study to identify sex-related differences. *La Medicina del lavoro*, *112*(4), 306–319. https://doi.org/10.23749/mdl.v112i4.11316
17. Hu, D., Kong, Y., Li, W., Han, Q., Zhang, X., Zhu, L. X., Wan, S. W., Liu, Z., Shen, Q., Yang, J., He, H. G., & Zhu, J. (2020). Frontline nurses' burnout, anxiety, depression, and fear statuses and their associated factors during the COVID-19 outbreak in Wuhan, China: A large-scale cross-sectional study. *EClinicalMedicine*, *24*, 100424. https://doi.org/10.1016/j.eclinm.2020.100424
18. Jiang, W., Zhao, X., Jiang, J., Zhou, Q., Yang, J., Chen, Y., Goldsamt, L., Williams, A. B., & Li, X. (2021). Hospital ethical climate associated with the professional quality of life among nurses during the early stage of COVID-19 pandemic in Wuhan, China: A cross-sectional study. *International journal of nursing sciences*, *8*(3), 310–317. https://doi.org/10.1016/j.ijnss.2021.05.002
19. Murat, M., Köse, S., & Savaşer, S. (2021). Determination of stress, depression and burnout levels of front-line nurses during the COVID-19 pandemic. *International journal of mental health nursing*, *30*(2), 533–543. https://doi.org/10.1111/inm.12818
20. Spoorthy, M. S., Pratapa, S. K., & Mahant, S. (2020). Mental health problems faced by healthcare workers due to the COVID-19 pandemic-A review. *Asian*

journal of psychiatry, *51*, 102119. https://doi.org/10.1016/j.ajp.2020.102119
21. Dimitriu, M., Pantea-Stoian, A., Smaranda, A. C., Nica, A. A., Carap, A. C., Constantin, V. D., Davitoiu, A. M., Cirstoveanu, C., Bacalbasa, N., Bratu, O. G., Jacota-Alexe, F., Badiu, C. D., Smarandache, C. G., & Socea, B. (2020). Burnout syndrome in Romanian medical residents in time of the COVID-19 pandemic. *Medical hypotheses*, *144*, 109972. https://doi.org/10.1016/j.mehy.2020.109972
22. Panari, C., Caricati, L., Pelosi, A., & Rossi, C. (2019). Emotional exhaustion among healthcare professionals: the effects of role ambiguity, work engagement and professional commitment. *Acta bio-medica : Atenei Parmensis*, *90*(6-S), 60–67. https://doi.org/10.23750/abm.v90i6-S.8481
23. Wu, Y., Wang, J., Luo, C., Hu, S., Lin, X., Anderson, A. E., Bruera, E., Yang, X., Wei, S., & Qian, Y. (2020). A Comparison of Burnout Frequency Among Oncology Physicians and Nurses Working on the Frontline and Usual Wards During the COVID-19 Epidemic in Wuhan, China. *Journal of pain and symptom management*, *60*(1), e60–e65. https://doi.org/10.1016/j.jpainsymman.2020.04.008
24. . 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
25. Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual review of psychology*, *52*, 397–422. https://doi.org/10.1146/annurev.psych.52.1.397
26. Worldometers.info. 2021. Italy COVID: 4,942,135 Cases and 133,330 Deaths - Worldometer. [online] Available at: <https://www.worldometers.info/coronavirus/country/italy/> [Accessed 24 November 2021].
27. Worldometers.info. 2021. China COVID: 98,546 Cases and 4,636 Deaths - Worldometer. [online] Available at: <https://www.worldometers.info/coronavirus/country/china/> [Accessed 24 November 2021].
28. Worldometers.info. 2021. Turkey COVID: 8,624,580 Cases and 75,443 Deaths - Worldometer. [online] Available at: <https://www.worldometers.info/coronavirus/country/turkey/> [Accessed 24 November 2021].
29. Hwang, H., Hur, W. M., & Shin, Y. (2021). Emotional exhaustion among the South Korean workforce before and after COVID-19. *Psychology and psychotherapy*, *94*(2), 371–381. https://doi.org/10.1111/papt.12309
30. Salazar de Pablo, G., Vaquerizo-Serrano, J., Catalan, A., Arango, C., Moreno, C., Ferre, F., Shin, J. I., Sullivan, S., Brondino, N., Solmi, M., & Fusar-Poli, P. (2020). Impact of coronavirus syndromes on physical and mental health of health care workers: Systematic review and meta-analysis. *Journal of affective disorders*, *275*, 48–57. https://doi.org/10.1016/j.jad.2020.06.022
31. Galanis, P., Vraka, I., Fragkou, D., Bilali, A., & Kaitelidou, D. (2021). Nurses' burnout and associated risk factors during the COVID-19 pandemic: A systematic review and meta-analysis. *Journal of advanced nursing*, *77*(8), 3286–3302. https://doi.org/10.1111/jan.14839

32. Batra, K., Singh, T. P., Sharma, M., Batra, R., & Schvaneveldt, N. (2020). Investigating the Psychological Impact of COVID-19 among Healthcare Workers: A Meta-Analysis. *International journal of environmental research and public health*, *17*(23), 9096.