

Improvement in the psychological health of nurses working during the COVID-19 pandemic

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Funding information

Fonterra Co-Operative Group, Grant/Award Number: 5001003

Abstract

Background: Nurses are a critical component of any healthcare system. The novel coronavirus pandemic has resulted in an increased workload for nurses and heightened stress.

Aims: To assess the psychological health over time of nurses working during the COVID-19 pandemic and to examine the factors associated with stress, anxiety, and psychological wellbeing.

Methods: Nurses enrolled in the study between 2 July and 26 August 2020 and completed questionnaires about stress, anxiety, and psychological wellbeing at baseline and at a second time point T2 12 weeks later. A paired sample t-test was used to examine whether changes in stress, anxiety, and psychological wellbeing were significantly different between baseline and T2. Linear regression models examined factors associated with psychological health outcomes.

Results: Of the 600 nurses initially enrolled, 484 (80.7%) completed psychological health measures at T2. Stress, anxiety, and poor psychological wellbeing scores were high at baseline. Unexpectedly, stress and psychological wellbeing significantly improved between baseline and T2, while anxiety levels increased. Younger nurses had higher baseline stress and anxiety scores.

Conclusions: This study demonstrates the potential beneficial effect of effective public health management of the COVID-19 pandemic on nurses' stress and psychological wellbeing and highlights the importance of longitudinal research to understand psychological health in nurses.

KEYWORDS

Anxiety, COVID-19, Stress

1 | INTRODUCTION

Nurses form a large proportion of the healthcare workforce and provide critical services in the health system. Nursing involves exposure to challenges, including high workloads, interactions with patients and families at difficult times, and exposure to stressful events at work. Some of these experiences can result in vicarious traumatization, with studies reporting higher rates of posttraumatic stress disorder (PTSD) in nurses, than in the general population.^{1,2}

Vicarious trauma occurs when witnessing distressing events at work negatively affects a healthcare workers emotional wellbeing. The COVID-19 pandemic contributed multiple novel stressors, particularly early on when the virus was an unfamiliar infection, the science about transmission was emerging and rapidly evolving, and the trajectory of the pandemic was unclear. In addition to the stressful pandemic-related events experienced by the population in general, nurses reported concerns about adequate Personal Protective Equipment (PPE) to prevent themselves from becoming unwell,

concerns about transmitting COVID-19 to their families, and a dramatic increase in acuity and volume of work.³ Surveys of psychological health in nurses conducted early in the pandemic reported high rates of stress, anxiety, depression, and PTSD.^{4,5}

Nurses' psychological wellbeing may be more affected by the stressors of the pandemic than that of other medical professionals. A study of healthcare workers from a large metropolitan hospital in Melbourne, Australia surveyed 668 healthcare workers, of whom, 391 were nurses and midwives. They found that 29% of nurses and midwives had moderate to severe anxiety, a rate that was significantly higher than doctors.⁶ A recent review of the literature identified 18 of 34 studies that reported nurses had higher rates of depression, anxiety, stress, and trauma than physicians or other healthcare workers.⁷

Conversely, other reports suggest a degree of resilience in health professionals. For example, rates of anxiety were significantly higher in nonmedical healthcare workers than medical workers in a Singaporean study conducted in the 2020 COVID-19 pandemic year. Exposure to stress may be commonplace for medical workers who have a higher degree of mental preparedness, previous experience dealing with surges in disease prevalence, and better access to psychological support.⁵ Vicarious trauma was reduced in front-line nurses compared to nurses working in other environments, and less than those in the general population,⁸ again suggesting that nurses may have a degree of resilience that assists them in managing the stressful demands of their work.

Monitoring nurses' mental health and wellbeing in the face of the global pandemic is essential to facilitate timely and appropriate intervention to address identified problems.⁹ Studies have surveyed psychological distress in healthcare workers early in the pandemic in China, Spain, Iraq, and Italy,^{4,10-12} all countries where significant outbreaks of COVID-19 have placed stress on public health resources. These studies report high levels of psychological distress in healthcare workers caring for COVID-19 patients. The psychological experience of nurses working during the pandemic is likely to reflect the broader COVID-19 situation in the respective country at the time of the survey. The cross-sectional survey design of these previous reports provides a snapshot of psychological distress at a single point early in the pandemic. However, few if any studies have measured psychological outcomes at more than a single time point.

This study aimed to assess nurses' psychological wellbeing over time during the COVID-19 pandemic in New Zealand. A further aim was to investigate factors associated with stress, anxiety, and psychological wellbeing in nurses.

2 | METHODS

2.1 | Participants

Participants were 600 registered nurses working in a clinical environment in New Zealand who enrolled in the study between 2 July 2020 and 26 August 2020.

2.2 | Data collection

Participants were recruited through the advertisement of the study on social media groups of interest to nurses and through nursing organizations who advertised the study to their members. A secure online database managed all consent and data collection, and participants could give consent and answer questionnaires using their phone, tablet, or computer. At baseline, participants provided demographic and employment information. Nurses answered questions about stress, anxiety, and psychological wellbeing at enrollment and at a second time (T2), 12 weeks later.

2.3 | Psychological measures

2.3.1 | Stress

The Perceived Stress Scale is a 10-item questionnaire that asks about stress and coping in the previous month.¹³ Scores range from 0 to 40, with higher scores being indicative of higher levels of stress. Scores from 0 to 13 represent low stress, scores from 14 to 26 equate to moderate stress, and scores from 27 to 40 equate to high stress. The internal consistency (Cronbach's alpha) for the 10 perceived stress scale items is 0.85.

2.3.2 | Anxiety

The State Trait Anxiety Inventory 6 item version (STAI6) is a short 6-item scale validated as an anxiety screening questionnaire based on the longer State Trait Anxiety Inventory, 20 items.¹⁴ A cut-off of score >50 indicated clinically significant levels of anxiety. The internal consistency (Cronbach's alpha) for the STAI6 is 0.85 in our sample.

2.4 | Psychological wellbeing

The World Health Organisation wellbeing index, the WHO-5, is a five-item, positively-worded measure of psychological wellbeing, which gives scores ranging from 0 to 25. Higher scores represent greater wellbeing. Scores of 13 or lower indicate low levels of psychological wellbeing. A systematic review of the WHO-5 concluded that it was a widely used and sensitive measure of depression.¹⁵ The internal consistency (Cronbach's alpha) for the WHO5 in our study is 0.83.

For stress, anxiety, and psychological wellbeing, change in scores from baseline (T1) to 12 weeks later (T2) were calculated for each of the three outcome measures by subtracting the score at the end of the study from the baseline score.

TABLE 1 Characteristics of the sample of 600 nurses at baseline

Sample Characteristics	N (%)
Sex	
Male	19 (3.2)
Female	581 (96.8)
Ethnicity	
European	446 (74.3)
Māori	42 (7.0)
Pacific	9 (1.5)
Asian	38 (6.3)
Other	65 (10.8)
Age Group	
18 – 24	68 (11.3)
25 – 34	184 (30.7)
35 – 44	115 (19.2)
45 – 54	132 (22.0)
55 – 70	101 (16.8)
Place of work	
Hospital	404 (67.3)
GP	65 (10.8)
Community	82 (13.7)
Residential	15 (2.5)
Other	28 (4.7)
Missing	6 (1.0)
Hours/week worked	
5 – 10	4 (0.7)
11 – 20	26 (4.3)
21 – 30	94 (15.7)
31 – 40	393 (65.5)
41+	83 (13.8)

2.5 | The COVID-19 environment

In July 2020, New Zealand was at COVID-19 Alert Level 1 (no restrictions other than international travel), and there were no COVID-19 cases in the community. On 12 August 2020, Auckland, the largest metropolitan city in New Zealand, where approximately a third of the population resides, was moved to Alert Level 3. This lockdown included the closure of schools, university campuses, retail outlets, and hospitality venues. People were encouraged to work from home, except for essential workers. All regional travel in and out of the city stopped except for essential movements. At the same time, the remainder of New Zealand moved to Alert Level 2, which

TABLE 2 Categorical Stress, Anxiety and Wellbeing Scores at Baseline and End of Study Mean

	Baseline (n = 600)	End of Study (n = 484)
Stress	N (%)	N (%)
High	41 (6.8)	16 (3.3)
Moderate	465 (77.5)	252 (52.1)
Low	94 (15.7)	216 (44.6)
Anxiety		
High	417 (69.5)	393 (81.2)
Low/Mod	183 (30.5)	91 (18.8)
Psychological Wellbeing		
Good	197 (32.8)	306 (63.2)
Poor	403 (67.2)	178 (36.8)

restricted gatherings to only those with fewer than 100 people, required restaurants to seat patrons, and increased the distance between groups. Auckland moved to Alert Level 2 on 30 August 2020. All regions except Auckland moved back to Alert Level 1 on 21 September 2020, followed by Auckland on 7 October 2020.

2.6 | Ethics

The study received full ethical approval from the Auckland Health Research Ethics Committee.

2.7 | Statistical analysis

Statistical analyses were performed using SAS 9.4. Two sample t-tests assessed whether respondents and non-respondents differed in baseline stress, anxiety, or psychological wellbeing score. Chi-square tests tested whether respondents and non-respondents differed in sex, ethnicity, age group, or hours per week worked. A significant change in stress anxiety and psychological wellbeing scores between baseline and T2 were examined using t-tests. Linear regression models analyzed the association between baseline psychological measures and demographic and employment factors.

3 | RESULTS

Of the 600 nurses enrolled in the study and surveyed about their psychological health, 484 (80.7%) completed psychological health questionnaires again at follow-up 12 weeks later. Those who responded at the end of the study did not differ from non-respondents in sex ($p = .85$). Younger nurses ($p < .0001$) and Asian Nurses ($p = .01$) were less likely to respond at follow-up. There was no difference in

baseline anxiety ($p = .16$), and psychological wellbeing ($p = .59$) scores between respondents and non-respondents. However, non-respondents had higher stress scores ($p = .03$) at baseline than respondents. Table 1 shows the age, sex, ethnicity, place of work, and hours per week worked of the sample. In New Zealand, individuals often identify with more than one ethnic group. Prioritized ethnicity classifies individuals who list more than one ethnic group according to the following order of priority: Māori, Pacific, Asian, European, MELAA (Middle Eastern, Latin American, or African), and other.

At baseline, the majority of nurses reported moderate (77.5%) or high (6.8%) stress levels, high levels of anxiety (69.5%), and poor psychological wellbeing (67.2%) according to the established cut-offs for each measure (Table 2). Scores on measures of stress and psychological wellbeing significantly improved for the group from baseline to follow-up 12 weeks later, whereas anxiety worsened (Table 3).

Ethnicity, place of employment, hours per week worked, and sex were not significantly associated with psychological health outcomes in bivariate analysis. Age was significantly associated with stress and anxiety. Younger nurses aged 18-24 reported higher stress scores (Estimate = 2.90. 95%CI: 1.27, 4.53) and lower anxiety scores (Estimate = -5.56 95%CI: -9.35, -1.76) than nurses aged 55-70 in adjusted analysis. Nurses aged 35-44 reported higher stress levels (Estimate = 1.50. 95%CI: 0.09, 2.92) than their colleagues aged 55-70 (Table 4).

4 | DISCUSSION

This study measured stress, anxiety, and psychological wellbeing in nurses at two time points during the second half of the 2020 COVID-19 pandemic year. Nurses reported high baseline levels of stress, anxiety, and poor psychological wellbeing. This finding is consistent with international studies that have reported elevated levels of psychological distress in nurses working during the COVID-19 pandemic^{4-6,12} and high rates of psychological distress among nurses reported in the earlier Sudden Acute Respiratory Syndrome outbreak.¹⁶ The mean baseline perceived stress score of 19.1 was similar to that reported in a study of Iraqi physicians (mean = 18.8)¹¹ and to that reported in student nurses (mean = 22.7).¹⁷

Stress levels reduced and psychological wellbeing improved over time in our sample. This result is interesting. The reduction in

psychological distress seen in our study could reflect a trajectory of improving psychological distress that has not been measured in previous cross-sectional studies. When earlier studies were conducted at the beginning of the pandemic, little was known about the transmission of the novel coronavirus, the risk factors for severe disease, and whether treatment or vaccination was possible. Studies conducted at this point in early 2020 reported high stress burnout and fear among nurses.^{4,5,8,10,12} However, these studies were cross-sectional and therefore did not reassess psychological distress at a later time in the same participants. It is possible that as scientific understanding of the SARS-CoV2 virus emerged, more was known about transmission, and work began on vaccine development that stress may have reduced in nurses as it did in our study. The observation that significant improvements in stress and psychological wellbeing occurred over time while anxiety increased is interesting. It might be that perceived situational stress reported by participants improved over time while the emotional arousal symptoms of anxiety persisted and participants were more likely to report these at the end of the study. The STAI6 asks about both state and trait anxiety. Trait anxiety reflects relatively stable aspects of an individual's propensity to being anxious. High levels of trait anxiety coupled with more persistent state anxiety could explain why nurses in our sample reported an increase in anxiety from an already high baseline. Further longitudinal examination of the patterns of stress and psychological health in nurses working throughout the pandemic will help understand typical wellbeing trajectories.

Improvements in psychological outcomes between baseline and the second time point suggest that as the COVID-19 situation improved in New Zealand wellbeing of nurses also got better. Relative to other countries in the world, New Zealand has been successful in eliminating COVID-19 from the community using a combination of strict lockdown measures and prompt contact tracing to limit the spread of the virus after case identification. Research has demonstrated the efficacy of lockdown measures (such as those in New Zealand) for controlling the spread of the virus.^{18,19} Before the commencement of our study in July, on 25 March 2020, the New Zealand Government initiated a nationwide lockdown closing all schools, businesses and issuing stay-at-home restrictions. People were allowed to leave their homes for personal exercise, access essential healthcare, or buy essential supplies. This lockdown lasted four weeks, followed by a gradual easing of restrictions. As a result of this government-led management, New Zealand could eliminate COVID-19 from the community, and there have been fewer overall

	Baseline (n = 600)	End of Study (n = 484)	Change in score	DF	t-statistic	p-value
	Mean (SD)	Mean (SD)	Mean (SD)			
Stress	19.1 (5.3)	14.7 (6.0)	4.2 (5.5)	483	16.55	<.0001
Anxiety	56.9 (12.4)	63.2 (12.4)	-5.9 (12.9)	483	-10.03	<.0001
Psychological Wellbeing	11.9 (4.0)	14.6 (4.4)	-2.7 (4.1)	483	-14.39	<.0001

TABLE 3 Change in mean stress, anxiety, and psychological wellbeing scores from baseline to the end of study

TABLE 4 Associations between age and psychological health measures at baseline

Age Group	Stress			Anxiety			Psychological wellbeing		
	Estimate (95% CI)	t-statistic	p-value	Estimate (95% CI)	t-statistic	p-value	Estimate (95% CI)	t-statistic	p-value
			ω^2						ω^2
			0.0187						0.0093
18 - 24	2.90 (1.27, 4.53)	3.49	0.0005	-5.56 (-9.35, -1.76)	-2.87	0.0042	0.05 (-1.17, 1.28)	0.08	0.94
25 - 34	0.47 (-0.82, 1.75)	0.71	0.48	-0.92 (-3.92, 2.07)	-0.6	0.55	0.51 (-0.46, 1.47)	1.03	0.3
35 - 44	1.50 (0.09, 2.92)	2.07	0.04	-1.65 (-4.95, 1.64)	-0.98	0.33	-0.11 (-1.17, 0.96)	-0.2	0.84
45 - 54	0.78 (-0.59, 2.15)	1.12	0.26	-0.85 (-4.05, 2.35)	-0.52	0.6	-0.42 (-1.45, 0.62)	-0.79	0.43
55 - 70	Ref			Ref			Ref		

Note: Degrees of freedom were 591 in all analysis.

restrictions since mid-2020 on daily life than those experienced in many other countries. We conducted this study in the second half of 2020, and the wellbeing of nurses might have followed a trajectory of improvement because confidence in the government level management of COVID-19 meant there were few if any restrictions on daily life after mid-2020. For nurses working in patient-contact settings, fewer cases of the virus (with only those in managed isolation at the border) has also resulted in fewer strains on the healthcare system and reduced exposure to COVID-19 patients at work. Previous studies have demonstrated the positive impact on the psychological wellbeing of healthcare workers that occurs when organizational level communication and support is good.⁷ Our results may reflect the broader benefits of successful public health management strategies on the psychological wellbeing of the nursing workforce.

The observed increase in anxiety in our sample of nurses could reflect the residual effect of heightened stress during the 2020 COVID-19 pandemic year. While reductions in stress were observed the impact of a stressful period may have been reflected in reporting of anxiety symptoms that are more persistent, and there is a latency in the responsiveness of anxiety to improvements in the COVID-19 situation. With so few studies monitoring psychological health in a cohort of nurses over time, future studies with this design will help to understand the dimensions of psychological health.

Individual level resilience and vulnerability factors will also influence the psychological experience of nurses. Resilience results from a combination of individual factors such as genetics and temperament, and environmental experiences. Younger nurses in our study aged 18-24 years reported higher stress scores and anxiety scores than their more senior colleagues. Distress in younger nurses may have been expressed in their perception of stress levels and anxiety symptoms. Studies conducted during the COVID-19 pandemic have also reported higher degrees of psychological distress in younger nurses.^{6,20} A previous multigenerational survey in nurses found that those from the baby boomer generation had lower levels of stress and burnout than their younger Generation X and Y colleagues. Generation Y nurses were more sensitive to stress and adversity.²¹ By virtue of their age, younger nurses have less clinical experience, and stress associated with clinical work is, therefore, less familiar to younger nurses who consequently have not developed their coping strategies to the same degree as their senior colleagues.

We found no significant difference in baseline psychological health according to the working environment. Previous studies have reported higher stress in nurses working in front-line roles during the pandemic.²² In New Zealand, rates of COVID-19 in the community and consequently in healthcare settings have been very low, which may have resulted in fewer differences in COVID-19 related stress according to the workplace for nurses in our study. Hours per week worked were not significantly associated with baseline psychological health measures in nurses, consistent with a previous study that found no difference in psychological distress experienced by part-time or full-time nurses.¹²

When considering the generalizability of our results to other groups of nurses, some factors need to be acknowledged. Nurses

who did not respond at the second time point had higher baseline stress scores than respondents. These nurses may not have followed a trajectory of decreasing psychological distress over time. Our study was conducted in a country with few COVID-19 cases and a well-functioning public health response to managing the pandemic. Results are likely to reflect the impact of the societal environment on nurse wellbeing. These results may not be generalizable to nurses working in other countries struggling with subsequent waves of COVID-19 infection, overwhelmed healthcare services, and logistical and economic challenges to implementing government-led restrictions. However, our study demonstrates the potential positive effect of a well-managed public health response on nurse wellbeing. Interventions to support psychological health in nurses should not be restricted to those targeted at the individual level but should also consider the benefit of organizational and societal level interventions.

5 | CONCLUSION

This study provides rare and valuable longitudinal information about psychological health in nurses over time during the COVID-19 pandemic. It reports data from a country where the government-led public health response to COVID-19 has successfully eliminated COVID-19 from the community. This assists in identifying the additional contribution to psychological distress in nurses that occurs in countries with a less successful national management strategy for the pandemic. Further research examining stress and the factors that influence medium- and long-term outcomes will help to understand vulnerability and resilience factors.

FUNDING

This project received funding from Fonterra Cooperative Group Limited.

DISCLOSURE

No author has any conflict of interest.

DATA AVAILABILITY STATEMENT

Data in raw form cannot be made available under the ethical approval for this study.

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REFERENCES

- Adriaenssens J, de Gucht V, Maes S. The impact of traumatic events on emergency room nurses: findings from a questionnaire survey. *Int J Nurs Stud*. 2012;49(11):1411-1422. <https://doi.org/10.1016/j.ijnurstu.2012.07.003>
- Mealer ML, Shelton A, Berg B, Rothbaum B, Moss M. Increased prevalence of post-traumatic stress disorder symptoms in critical care nurses. *Am J Respir Crit Care Med*. 2007;175(7):693-697. <https://doi.org/10.1164/rccm.200606-735OC>
- Shanafelt T, Ripp J, Trockel M. Understanding and addressing sources of anxiety among health care professionals during the COVID-19 pandemic. *JAMA: The Journal of the American Medical Association*. 2020;323(21):2133-2134. <https://doi.org/10.1001/jama.2020.5893>
- Shen Y, Zhan Y, Zheng H, Liu H, Wan Y, Zhou W. Anxiety and its association with perceived stress and insomnia among nurses fighting against COVID-19 in Wuhan: a cross-sectional survey. *J Clin Nurs*. 2021;30(17-18):2654-2664. <https://doi.org/10.1111/jocn.15678>
- Tan BYQ, Chew NWS, Lee GKH, et al. Psychological impact of the COVID-19 pandemic on health care workers in Singapore. *Ann Intern Med*. 2020;173(4):317-320. <https://doi.org/10.7326/M20-1083>
- Holton S, Wynter K, Trueman M, et al. Psychological well-being of Australian hospital clinical staff during the COVID-19 pandemic. *Australian Health Review: A Publication of the Australian Hospital Association*. 2021;45(3):297-305. <https://doi.org/10.1071/AH20203>
- Sirois FM, Owens J. Factors associated with psychological distress in health-care workers during an infectious disease outbreak: a rapid systematic review of the evidence. *Front Psychiatry*. 2021;11. <https://doi.org/10.3389/fpsy.2020.589545>
- Li Z, Ge J, Yang M, et al. Vicarious traumatization in the general public, members, and non-members of medical teams aiding in COVID-19 control. *Brain Behav Immun*. 2020;88:916-919. <https://doi.org/10.1016/j.bbi.2020.03.007>
- Stelnicki AM, Carleton RN, Reichert C. Nurses' mental health and well-being: COVID-19 impacts. *CJNR*. 2020;52(3):237-239. <https://doi.org/10.1177/0844562120931623>
- Lenzo V, Quattropiani MC, Sardella A, Martino G, Bonanno GA. Depression, anxiety, and stress among healthcare workers during the COVID-19 outbreak and relationships with expressive flexibility and context sensitivity. *Front Psychol*. 2021;12:623033. <https://doi.org/10.3389/fpsyg.2021.623033>
- Abdulah DM, Mohammed AA. The consequences of the COVID-19 pandemic on perceived stress in clinical practice: experience of Doctors in Iraqi Kurdistan. *Rom J Intern Med*. 2020;58(4):219-227. <https://doi.org/10.2478/rjim-2020-0020>
- Ruiz-Fernández MD, Ramos-Pichardo JD, Ibáñez-Masero O, Cabrera-Troya J, Carmona-Rega MI, Ortega-Galán ÁM. Compassion fatigue, burnout, compassion satisfaction and perceived stress in health-care professionals during the COVID-19 health crisis in Spain. *J Clin Nurs*. 2020;29(21-22):4321-4330. <https://doi.org/10.1111/jocn.15469>
- Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav*. 1983;24(4):385-396.
- Marteau TM, Bekker H. The development of a six-item short-form of the state scale of the Spielberger State-Trait Anxiety Inventory (STAI). *Br J Clin Psychol*. 1992;31(Pt 3):301-306.
- Topp CW, Østergaard SD, Søndergaard S, Bech P. The WHO-5 well-being index: a Systematic Review of the Literature. *Psychother Psychosom*. 2015;84(3):167-176. <https://doi.org/10.1159/000376585>
- Chong MY, Wang WC, Hsieh WC, et al. Psychological impact of severe acute respiratory syndrome on health workers in a tertiary hospital. *Br J Psychiatry*. 2004;185:127-133. <https://doi.org/10.1192/bjp.185.2.127>
- Onieva-Zafra MD, Fernández-Muñoz JJ, Fernández-Martínez E, García-Sánchez FJ, Abreu-Sánchez A, Parra-Fernández ML. Anxiety, perceived stress and coping strategies in nursing students: a cross-sectional, correlational, descriptive study. *BMC Med Educ*. 2020;20(1):370. <https://doi.org/10.1186/s12909-020-02294-z>
- Alfano V, Ercolano S. The efficacy of lockdown against COVID-19: a cross-country panel analysis. *Appl Health Econ Health Policy*. 2020;18(4):509-517. <https://doi.org/10.1007/s40258-020-00596-3>

19. Vinceti M, Filippini T, Rothman KJ, et al. Lockdown timing and efficacy in controlling COVID-19 using mobile phone tracking. *EClinicalMedicine*. 2020;25:100457. <https://doi.org/10.1016/j.eclim.2020.100457>
20. Youssef N, Mostafa A, Ezzat R, Yosef M, El Kassas M. Mental health status of health-care professionals working in quarantine and non-quarantine Egyptian hospitals during the COVID-19 pandemic. *East Mediterr Health J*. 2020;26(10):1155-1164. <https://doi.org/10.26719/emhj.20.116>
21. Stevanin S, Palese A, Bressan V, Vehviläinen-Julkunen K, Kvist T. Workplace-related generational characteristics of nurses: A mixed-method systematic review. *J Adv Nurs*. 2018;74(6):1245-1263. <https://doi.org/10.1111/jan.13538>
22. Batra K, Singh TP, Sharma M, Batra R, Schvaneveldt N. Investigating the psychological impact of COVID-19 among healthcare workers: a meta-analysis. *Int J Environ Res Public Health*. 2020;17(23):9096. <https://doi.org/10.3390/ijerph17239096>

How to cite this article: Slykerman RF, Li E and Booth RJ. Improvement in the psychological health of nurses working during the COVID19 pandemic. *Nurs Forum*. 2022;57:87-93. <https://doi.org/10.1111/nuf.12660>