RESEARCH ARTICLE

Nurses' well-being during the coronavirus (2019) pandemic: A longitudinal mixed-methods study

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Abstract

Aim: To determine prevalence, predictors and change over time of nurses' and student nurses' mental health and well-being, and explore nurses' perceptions, barriers and enablers of well-being.

Design: Longitudinal mixed-methods survey.

Methods: Forty-nine students and registered nurses participated from Victoria, Australia. Data were collected from December 2019 to July 2020. Validated psychometrics and free-text response questions were employed. Analysis used latent growth curve modelling, Pearson product-moment correlations and thematic analysis.

Results: A strong positive correlation was found between self-determination and work well-being, and a strong negative correlation between work well-being and flight risk. Several moderate relationships were found; a moderate positive correlation between work well-being and nurse manager ability, leadership and support, and a moderate negative correlation between burnout and staffing and resource adequacy. Collegial nurse–physician relationships deteriorated. Three themes, physical health, psychological well-being and social connection, were identified as important for nurses' well-being.

1 | INTRODUCTION

Evidence presented in *The State of the World's Nursing Report* published by the World Health Organization in April 2020, together with the coronavirus-19 pandemic, brings into sharp focus the unprecedented demands currently being placed on the capacity and capability of the nursing workforce worldwide (World Health Organization, 2020). There is an urgent need to address the pressing nursing workforce shortages and the demands on the profession that continues to present as burnout, stress, anxiety and depression (Al Thobaity & Alshammari, 2020; Dall'Ora et al., 2020; Lasater et al., 2021; Wong et al., 2020) leading to challenges in both recruitment and retention (Jarden, Jarden, Weiland, Taylor, Bujalka, et al., 2021).

2 | BACKGROUND

Over the last two decades, research has demonstrated the benefits of enhanced health workers' well-being are widespread for the public, nurses and organizations. For example, health workers' well-being impacts on healthcare system performance whereby empowerment, quality sleep and positive workplace relationships were found to be correlated with patient satisfaction and lower turnover intentions (Ray-Sannerud et al., 2015). In contrast, health workers' illbeing, such as burnout and psychological distress were found to be correlated with suboptimal patient care (Brunetto et al., 2013; Ray-Sannerud et al., 2015). Such findings underscore the importance of well-being for this workforce. Well-being is commonly considered a balance between an individual's resources and challenges faced (Dodge et al., 2012), or feeling good and functioning effectively (Huppert, 2009). Models of well-being typically suggest the components include positive relationships, emotions, purpose in life and meaning, personal growth, autonomy, engagement, accomplishment and self-acceptance (Hone, Jarden, et al., 2015).

Nurses are at the forefront of pandemics, such as coronavirus-19, and will be essential in managing the consequences of pandemics in years to come (International Council of Nurses, 2020). With 10% of coronavirus-19 cases globally being amongst healthcare workers (International Council of Nurses, 2020), it is not surprising these are times of illbeing for nurses. Throughout late 2020 there was the publication of novel research investigating the impact of coronavirus-19 on well-being, for example, the special issue on "coronavirus-19 and well-being" in the International Journal of Wellbeing (www.internationaljournalofwellbeing.org) and on the impact of coronavirus-19 on health workers (Waters et al., 2021). What has not yet been explored is how nurses' well-being is prevailing over time.

2.1 | Aims

This study was part of a mixed-methods program of research investigating nurse well-being and mental health. This longitudinal survey had two main aims, first, to determine the prevalence, predictors and change over time of student and registered nurse' well-being and mental health, and second, to explore student and registered nurses' perceptions, barriers and enablers of their well-being. The five research questions aligned to these aims were: (1) What is the prevalence of student nurses' and registered nurses' well-being and mental health? (2) Does student nurses' and registered nurses' well-being and mental health change over the course of seven months, and if so which aspects and to what degree? (3) What are the predictors of student nurses' and registered nurses' well-being and mental health? (4) What are student nurses' and registered nurses' perceptions of well-being? (5) What are student nurses' and registered nurses' perceptions of barriers and enablers of their well-being? The study timeframes coincidentally enabled the investigation of these aims in the context of coronavirus-19.

3 | METHODS

3.1 | Design

This longitudinal mixed-methods survey included a battery of validated measures and free-text response questions. The survey data were collected online at three timepoints between December 2019 (before coronavirus-19) and July 2020 (first coronavirus-19 peak in Victoria, Australia; Department of Health and Human Services—Victoria, 2021) approximately three months apart. The survey design was underpinned by the well-being assessment recommendations of the Organization of Economic Cooperation and Development (2015). The addition of free-text questions in the survey was used to obtain additional depth that would not have been achievable using psychometric instruments alone, enabling greater insights into nurse well-being. After completing this longitudinal survey, participants were invited to participate in an interview as part of a qualitative descriptive study. The findings of the qualitative descriptive study are published elsewhere (Jarden, Jarden, Weiland, Taylor, Brockenshire, et al., 2021).

3.2 | Sample and setting

Recruitment was by convenience sampling from four organizations in the state of Victoria, Australia. The organizations included two large metropolitan healthcare organizations, one small rural healthcare

organization and one university nursing education provider. The estimated sample sizes sought, based on a 95% confidence level with a 5% margin of error, a conservative estimate of variance (50%) and allowing for a 10% dropout rate, were 400 registered nurses and 120 student nurses (based on 2018 organizational population data). The study was advertised through e-mail and local internal webpages. Participants selected a link to progress to the survey information page and to register their interest. Subsequently, a link to the consent and survey was e-mailed to participants. Survey participants had a chance to win a $500 prize on completion of all three surveys. Participants were eligible if they were student nurses in an entry to practice nursing program or registered nurses of any level or grade. Follow-up attempts were via e-mail.

3.3 | Instruments

Socio-demographic and other work-related information was obtained via a web-based survey at each of the three survey timepoints using the survey platform Work on Wellbeing (workonwellbeing. com; WoW). In all, the assessment battery comprised 151 items reported in full in Table 1.

In short, the assessment battery included the: (1) Work on Wellbeing assessment battery (50 items); (2) Flourishing Scale in the WoW battery (8 items: Diener et al., 2010); (3) Mental Health Continuum—Short Form (14 items: MHC-SF; Keyes, 2005); (4) Brief Resilience Scale (3 of the 6 items in the WoW battery, and the 3 of 6 additional items: Smith et al., 2008); (5) Burnout Measure (10 items: Malach-Pines, 2005); (6) Mindful Attention Awareness Scale (15 items: MAAS; Brown & Ryan, 2003); (7) Ten-Item Personality Inventory (10 items: TIPI; Gosling et al., 2003); (8) Depression, Anxiety, and Stress Scale (21 items: DASS; Lovibond & Lovibond, 1996); and (9) three subscales—Nurse Manager Ability, Leadership, and Support of Nurses; Staffing and Resource Adequacy; and Collegial Nurse–Physician Relations—of the Practice Environment Scale of the Nursing Work Index-Revised (12-items: NWI-R; Aiken & Patrician, 2000). In addition to the above scales, nine questions were included: three free-response questions and six dropdown questions. The free-response questions included: "What, in your opinion, are the key characteristics of well-being?" "What do you think would promote/enable/facilitate your well-being?" and "What current strategies, tools, initiatives and/or programmes do you currently use to promote/enable/facilitate your well-being? Please list things you do at home and work (individual level), things your team at work does (team level) and things your workplace organization does (organization level)." The six dropdown questions focused on the participant's work aspects such as work location and role type (e.g., "How many years of clinical experience do you have?" and "What is your primary nursing role?"). Lastly, demographic questions captured gender, age, location, relationship status, educational level, employment situation and length of employment.

3.4 | Ethical considerations

The research protocol was approved by the University and health organization's Human Research Ethics Committees (HREC/56492/MH-2019; 1954762.1), and the organizations' research governance offices. The research methods including recruitment, data storage and confidentiality were conducted in accordance with ethical guidelines and regulations. Informed consent was obtained from all participants in this study.

3.5 | Quantitative data analysis

To address research question one (prevalence), descriptive statistics of the main study variables were calculated using Statistical Package for the Social Sciences (SPSS; version 25; IBM Corp, Armonk, NY, USA). To address research question two (change over time), the longitudinal analysis of the data applied Latent Growth Curve Modelling in the Structural Equation Modelling (SEM) framework. A detailed description of latent growth modelling, such as assumptions, equations and implementation in SEM is provided by Singer et al. (2003) and Bollen and Curran (2006). Growth Modelling is one way to estimate a linear trajectory for the entire sample. In other words, this model can estimate an intercept and a slope describing the initial level and trajectory of well-being and mental health across time. This model can also estimate: (1) the influence of a latent factor explaining individual variability in initial levels of study well-being and illbeing, that is, individual differences around the intercept, (2) a latent factor explaining individual variability in the rate of change across time, that is, individual differences around the slope and (3) an estimate of the association (i.e., the covariance) between these latent factors. Analyses were run in *Mplus* 8.4 using observed variables. Given the small sample size and a large missing rate, Bayesian estimation was used. Each analysis was conducted with 1,000,000 draws, two Markov Chain Monte Carlo chains and the GIBBS (PX1) algorithm used for Markov Chain Monte Carlo. *Mplus'* default priors were used (Asparouhov & Muthén, 2010). To reduce autocorrelation between Markov Chain Monte Carlo draws, every 25th iteration was used. No participant was excluded for having missing data. Convergence and fit were evaluated using the potential scale reduction factor (PSRF; Gelman & Rubin, 1992) and Bayesian posterior predictive checking using chi-square. A PSRF smaller than 1.10 suggests convergence (Kaplan & Depaoli, 2012). A posterior predictive *p*-value (PPP) that is around .5 with a confidence interval that centers around 0 suggests a good fit (Muthén et al., 2017). Bayesian posterior parameter trace plots and autocorrelation plots were also examined. To address research question three (predictors), Pearson Product Moment correlations were computed between all the main study variables (regression analysis was not possible due to the low sample size).

TABLE 1 Assessment battery

Instrument	Items and scales
The Work on Wellbeing assessment	The Work on Wellbeing (WoW) assessment battery is a collection of previously validated scales and measures, and of individual items from the literature. The battery as a whole consists of 50 items and captures aspects of general well-being (6 items: life satisfaction, life evaluation, eudaimonia, anxiety and two items on Happiness) and flourishing (Flourishing Scale: Diener et al., 2010), life domain well-being (10 items capturing importance and satisfaction with 10 key domains of life, e.g., family, work, education, financial matters), work well-being (19 items; inclusive of 2 free response), resilience (3 items), and health and lifestyle factors (4 items). The WoW Factor score was calculated by an average of the scores of five questions (life satisfaction, life evaluation, eudaimonia, anxiety, happiness—the anxiety question was reverse-scored). This average was out of a range of 0–10; it was then converted into percentage. The work well-being score was calculated by an average of 17 work well-being questions (four of these questions were negatively phrased and reverse scored). This average was out of a range of 0–10; it was then converted into percentage. The self-determination score was calculated by an average of three work questions (autonomy, competence, relatedness). This average was out of a range of 0–10; it was then converted into percentage. The flight-risk score was calculated by an average of two sets of scores. The first set was the single question "How likely is it that you will leave your job in the next six months?" The second set was the six questions concerning work stress, work security, work motivation, work satisfaction, how proud a person is of their organization and how valued they feel. These two sets of scores were averaged, combined and then converted into a percentage. The health and lifestyle score was calculated by an average of four questions (perceived health, nutrition, physical activity, sleep) with a range of 0–10; it was then converted into percentage.
The Flourishing Scale	The Flourishing Scale (Diener et al., 2010) was included in the WoW battery and is a brief summary measure designed to assess respondents' self-perceived success in areas identified as important for psychological flourishing, including relationships, meaning and purpose, self-esteem and optimism. The eight-item scale captures eudaimonic dimensions of well-being that Ryff (1989) and Ryan and Deci (2001) suggest are important for positive functioning, with Cronbach's alpha of 0.93 (Drake & Steege, 2016). Each item is phrased in a positive direction, and the answers are measured on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The eight items are summed, and scores range from 8 to 56. A high score on the scale indicates respondents have a positive self-image in important areas of functioning.
The Mental Health Continuum Short Form	The Mental Health Continuum—Short Form (MHC-SF; Keyes, 2005) is a 14-item measure of emotional, social and psychological well-being with good internal consistency for both the total scale and 3 subscales, with Cronbach's alpha exceeding .80 (Keyes et al., 2012). Participants are asked to report how often they felt a certain way during the past month on a 6-point scale from 0 (never) to 5 (every day). Four scores are available: A total MHC-SF score, and emotional, social, and psychological wellbeing subscale scores. The total MHC-SF score ranges from 0–70, the emotional wellbeing subscale has three items and ranges from 0–15, the social wellbeing subscale has five items and ranges from 0–25, and the psychological wellbeing subscale has six items and ranges from 0–30. For each score (total MHC-SF score, emotional, social, and psychological subscale scores), items related to that subscale are summed. Higher scores indicate greater well-being overall and in these three areas.
The Brief Resilience Scale	The Brief Resilience Scale (Smith et al., 2008) is widely used as an outcome measure of resilience and consists of six items, which aim to measure the respondent's ability to "bounce back" from adversity. An example item is "I tend to bounce back quickly after hard times." Internal consistency has been reported as good, with Cronbach's alpha ranging from .80–.91 (Smith et al., 2008). Three of the six items are in the WoW battery (the positively phrased items), and the additional three (the negatively phrased items) were added for this study. The score for each item ranges from 1 (strongly disagree) to 5 (strongly agree). Items 2, 4 and 6 are negatively phrased so are reverse-coded before using the six items to calculate an average Brief Resilience Scale score, which ranges from 1 to 5. Interpretation of these scores from the authors suggests that a higher mean score indicates greater perceived resilience.
The Burnout Measure	The burnout measure (Malach-Pines, 2005) is a 10-item self-report measure that measures job burnout and is highly correlated with the emotional exhaustion subscale of the Maslach Burnout Inventory (Schaufeli & Van Dierendonck, 1993), with Cronbach's alpha exceeding .85 (Malach-Pines, 2005). Respondents indicate, on a 7-point scale ranging from 1 (never) to 7 (always), the frequency with which they experience symptoms of exhaustion related to their work: physical (e.g., "weak/sickly", "tired"), emotional ("hopeless", "helpless") and mental ("insecure/like a failure", "disappointed with people"). The mean of the 10 items is used as the score, with higher mean scores indicating greater burnout.
Mindful Attention Awareness Scale	The Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) is a 15-item scale designed to assess a core characteristic of dispositional mindfulness, namely, open or receptive awareness of and attention to what is taking place in the present. The MAAS taps a unique quality of consciousness that is related to, and predictive of, a variety of self-regulation and wellbeing constructs, with Cronbach's alpha exceeding .92 (MacKillop & Anderson, 2007). This 15-item scale addresses cognitive, emotional, physical, interpersonal and general domains in an indirect way (e.g., "I find myself doing things without paying attention"). Participants respond to each item using a 6-point scale ranging from 1 (almost always) to 6 (almost never) in order to indicate how frequently they experience the situation described in each item. A total score is the mean of the 15 items (range 1–6), with higher mean scores indicating greater mindfulness.

(Continues)

TABLE 1 (Continued)

Instrument	Items and scales
Ten-Item Personality Inventory	Personality is measured using the Ten-Item Personality Inventory (TIPI; Gosling et al., 2003). This is a ten-item measure of the big five personality dimensions—2 items for each of the 5 dimensions: extraversion, agreeableness, emotional stability (i.e., neuroticism), conscientiousness and openness to experience. Cronbach's alpha has been reported to range from .40 to .73 (Gosling et al., 2003). Each item is rated on a 7-point scale that ranges from 1 (disagree strongly) to 7 (agree strongly). Five scores are produced—one for each of the five dimensions of personality. Each dimension is the average of the two items, so scores range from 1–7 for each of the five dimensions. Higher mean scores indicate greater endorsement of each personality facet.
Depression, Anxiety, and Stress Scale	The Depression, Anxiety, and Stress Scale (Lovibond & Lovibond, 1996) is a 21-item scale that assesses a set of three self-report scales designed to measure the negative emotional states of depression, anxiety and stress. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic non-specific arousal and assesses difficulty relaxing, nervous arousal and being easily upset/agitated, irritable/over-reactive and impatient. Each of the three DASS subscales contain 7 items, and participants respond to each of the 21 items using a 4-point scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much or most of the time). Cronbach's alpha has been reported to be 0.73 to 0.88 (Wise et al., 2017). Participants rate the extent to which they have experienced each state over the past week. Each subscale is the total of the 7 items (range for each 0–21), with higher total scores indicating greater endorsement of the construct. A total score combining the three subscale totals is also calculated (0–63)—meaning four scores can be used (total DASS, depression, anxiety, stress).
The Nursing Work Index-Revised	Three subscales of the Practice Environment Scale of the Nursing Work Index-Revised (NWI-R; Aiken & Patrician, 2000; Lake, 2002) were included; in total 12 items. The three subscales include (1) nurse manager ability, leadership and support of nurses, (2) staffing and resource adequacy and (3) collegial nurse–physician relationships (Aiken & Patrician, 2000). Each item is rated on a 4-point Likert scale from 1 (strongly agree) to 4 (strongly disagree) as to whether organizational characteristics of their practice environment were present in their current job. A reliability generalization meta-analysis found scores on the PES-NWI are reliable for measuring the nursing practice environment across both USA and non-USA countries (Zangaro & Jones, 2019). Cronbach's alpha has been reported for the total scale of 0.95 and for each subscale between 0.71 and 0.90 (Parker et al., 2010). Scores for each subscale are the mean of the relevant items, with lower mean scores indicating stronger agreement that positive characteristics were present in their workplace.

3.6 | Qualitative data analysis

To address research questions four and five (perceptions), the six-phase thematic analysis approach of Braun and Clarke (2013) was used, which includes (1) familiarizing self with data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining themes and (6) producing the report. All data were independently coded, and initial data-driven themes were developed and recorded using Microsoft Excel by two researchers [RJ; NB]. The themes were reviewed and refined by both researchers together. The researchers adopted a reflexive stance to examine the potential influence of their pre-conceived expectations related to all stages of the research process inclusive of the research phenomenon, research questions and analysis.

4 | RESULTS

Forty-nine participants commenced the time-one survey; 9 student nurses and 40 registered nurses. An additional file provides the details of participants across the three timepoints [see Supporting information file 1]. Of the student and registered nurses, 36 continued to time two and 16 to time three. This represents a 26.5% time-one to time-two dropout rate and a 55.5% time-two to time-three dropout rates (overall a time one to time three, 67.3% dropout rate).

Those participants who dropped out did not respond to follow-up attempts, discussed further in study limitations. Participant characteristics are reported in Table 2.

Participants were primarily married females, with postgraduate education, in their current employment for seven years, and working for 35 or more hours per week. Participant hours of work, length of employment and level of education are detailed in an additional file [see Supporting information file 1]. Descriptive statistics (range, mean, standard deviation, coefficient alpha) of the main study variables, including all three timepoints (i.e., 101 assessment points), are displayed in Table 3.

These descriptive statistics are explored further in the context of other studies of similar samples in the discussion. Like many scales and measures used in social sciences (such as those used in this study) they are either positively or negatively skewed.

The latent growth curve modelling results and parameter estimates are presented in full in an additional file [see Supporting information file 2]. All models fit the data well, except the model for depression with a predictive p-value of 0.156, suggesting that a linear trend was not a good fit. This model was respecified by freeing the last time score (resulting in a model estimated time score of 0.444 for Time 3). The fit for the modified model was acceptable. Trace and autocorrelation plots also showed evidence of good convergence and mixing for all models. All the intercepts were significantly different from zero. All the variance estimates for the intercepts

and slopes were statistically significant, suggesting that there are individual differences in the initial values and growth trajectories for all variables. However, the only variable with a significant slope mean was *NWI-R—CollegialRelationships*. Collegial Nurse–Physician Relationships is a subscale of the Nursing Work Index-Revised characterized by positive working relationship between nurses and doctors (Lake, 2007). The growth trajectory for *CollegialRelationships* indicates that the values of *CollegialRelationships* increased over the period of the study, increasing from T1 (M = 2.96) to T2 (M = 3.22) to T3 (M = 3.31) (see Supporting information file 3). Note, for this scale lower scores indicate stronger agreement that positive characteristics were present in their workplace. Thus, the increase in values for *CollegialRelationships* represents a deterioration in the working relationships between nurses and doctors. Other variables did not change over time. To address research question three (predictors), Pearson Product Moment correlations were computed between all the main study variables and are presented in full in an additional file [see Supporting information file 4]. Very strong correlations (above $r = .70$, $p < .01$) were found between several variables. Notably, there was a very strong positive correlation between Self-determination and Work Wellbeing ($r = .83$), whereby high levels of Self-determination were associated with high levels of Work Wellbeing. A very strong negative correlation was found between Work Wellbeing and Flight Risk ($r = −.76$), whereby low levels of Work Wellbeing were associated with high levels of Flight Risk. Strong correlations (from $r = .50$ to $r = .69$, $p < .01$) were also found between several variables. Many of these related to burnout, for example, there was a strong positive correlation between (1) Burnout and DASS depression ($r = .51$). There was a strong negative correlation between (2) burnout and work well-being ($r = −.64$), (3) burnout and flourishing ($r = −.51$), (4) burnout and self-determination ($r = −.54$), and (5) burnout and MHC-SF total well-being ($r = −.57$). For the nursing work variables, there were moderate correlations (from $r = .30$ to $r = .49$, $p < .01$) found between several variables. Notably, moderate positive correlations were found between (1)

NWI-R—Nurse Manager Ability, Leadership and Support and Work Wellbeing ($r = .37$), (2) NWI-R—Nurse Manager Ability, Leadership and Support and Resilience ($r = .35$), (3) NWI-R—Nurse Manager Ability, Leadership and Support and MHC-SF Social Wellbeing ($r = .33$), (4) NWI-R—Staffing and Resource Adequacy and Resilience ($r = .33$), (5) NWI-R—Staffing and Resource Adequacy and MHC-SF Total ($r = .33$). Moderate negative correlations were found between (1) Burnout and NWI-R—Staffing and Resource Adequacy ($r = −.40$), and (2) Burnout and NWI-R Nurse Manager Ability, Leadership and Support ($r = −.33$).

The data from the free-text responses addressed research questions four and five (perceptions). Given the small sample of student nurses who participated in the survey (T1, $n = 9$; T2, $n = 5$); T3, $n = 0$), the student free-text responses were not included in the data analysis. Participants reported a total of 216 characteristics of well-being, 198 potential enablers of well-being and 168 actual enablers of well-being. Analysis of the 216 characteristics of well-being identified five primary themes: psychological well-being, physical health, social connection, work well-being and awareness of self. First, psychological well-being included positive emotions and the absence of negative influences or stressors, feeling resilient and safe, and optimism about the future. Second, physical health included staying active, a good diet, restful and energizing sleep, and living in a safe and secure environment. Third, social connection included having a sense of connection and not feeling lonely, spending time with family, feeling stable in terms of relationships, and feeling spiritually well. Fourth, work well-being included maintaining work-life balance, feeling satisfied with work, financial stability and experiencing a supportive workplace with positive collegial relationships. Fifth, an awareness of self-included engaging in self-care, feeling a sense of purpose and having goals, expressing self through social engagements and hobbies, and feeling resilient and fulfilled.

Analysis of the 198 potential enablers of well-being identified four primary themes: a positive workplace, physical and psychological health, work-life balance and social connection. Firstly, a

TABLE 2 Participants' characteristics (N = 49)

	Students	Rural	MetroOrgA	MetroOrgB	Combined
Time 1 (T1)					
N (% T1)	9 (18.3%)	7 (14.3%)	21 (42.9%)	12 (24.5%)	49
Age (mean)	34.7	35.0	43.3	38.3	39.3
Gender—female (% T1)	9 (19.1%)	7 (14.9%)	20 (42.6%)	11 (23.4%)	47 (95.9%)
Time 2 (T2)					
N (% of T2 sample)	5 (13.9%)	6 (16.7%)	16 (44.4%)	9 (25.0%)	36
Age (mean)	34.6	35.0	43.1	37.4	39.2
Gender—female (% T2)	5 (14.7%)	6 (17.6%)	15 (44.1%)	8 (23.5%)	34 (94.4%)
Time 3 (T3)					
N (% of T3 sample)	0 (0%)	1 (6.2%)	9 (56.3%)	6 (37.5%)	16
Age (mean)	0 (0%)	23.0	48.3	33.2	41.1
Gender—female (% T3)	0 (0%)	1 (6.7%)	8 (53.3%)	6 (40%)	15 (93.8%)

Abbreviations: T1, time one; T2, time two; T3, time three.

TABLE 3 Descriptive statistics of main study variables

Measure name (possible range)	Combined four samples (range), *M*, (*SD*), alpha
Work on Wellbeing	
WoW factor (0-100)	(18-100), *66.2*, (*16.1*), .798
Work wellbeing (0-100)	(18-98), *65.5*, (*14.0*), .886
Self-determination (0-100)	(17-100), *66.9*, (*16.7*), .718
Flight risk (0-100)	(0-92), *32.8*, (*22.4*), .768
Health and lifestyle (0-10)	(0-10), *6.1*, (*1.9*), .843
Flourishing Scale (8-56)	(29-56), *47.03*, (*5.96*), .870
Nursing Work Index-Revised	
Staffing, resources (1-4)	(1.0-4.0), *2.50*, (*0.84*), .886
Manager ability, leadership, support (1-4)	(1.2-4.0), *2.93*, (*0.75*), .844
Collegial relationships (1-4)	(1.0-4.0), *3.11*. (*0.76*), .947
Ten-Item Personality Index	
Extraversion (1-7)	(1-7), *4.44*, (*1.51*), .722
Agreeableness (1-7)	(2-7), *5.56*, (*1.17*), .561
Emotional stability (1-7)	(2-7), *5.01*, (*1.41*), .618
Conscientiousness (1-7)	(2-7), *6.16*, (*1.01*), .613
Open to experience (1-7)	(3.5-7), *5.40*, (*1.01*), .351
The burnout measure (1-7)	(1.2-5.5), *3.07*, (*1.04*), .890
Brief Resilience Scale (0-60)	(14-60), *40.81*, (*11.38*), .905
Mindful Attention Awareness Scale (1-6)	(1.60-5.87), *4.36*, (*0.83*), .906
Depression, Anxiety, Stress Scale	
DASS total (0-63)	(0-42), *12.03*, (*9.82*), .910
Depression (0-21)	(0-16), *3.27*, (*4.07*), .903
Anxiety (0-21)	(0-15), *3.04*, (*3.39*), .757
Stress (0-21)	(0-21), *5.73*, (*4.05*), .809
The Mental Health Continuum Short Form	
MHC-SF total (0-70)	(19-70), *51.55*, (*11.65*), .929
Emotional well-being (0-15)	(1-15), *11.98*, (*2.64*), .898
Social wellbeing (0-25)	(3-25), *15.97*, (*4.98*), .818
Psychological well-being (0-30)	(6-30), *23.60*, (*5.44*), .906

Abbreviations: DASS, Depression, Anxiety, Stress Scale; *M*, mean; MHC-SF, Mental Health Continuum—Short Form; *SD*, standard deviation; WoW, Work on Wellbeing.

positive workplace included experiencing a safe and supportive work environment, feeling respected and valued, having strong and team-focused leaders, and experiencing adequate breaks and fair rostering. Secondly, physical and psychological health included being able to access support from medical and allied health professionals; engaging in self-care such as exercise, hobbies, optimal sleep; and practicing mindfulness and meditation, and feeling positive. Thirdly, work-life balance included taking time for yourself, experiencing distance from work, and feeling financially stable and valued. Fourthly, social connection included adequate time for family, engaging with

hobbies, having support systems both outside and at work, and spending time with pets.

Analysis of the 168 identified enablers of well-being identified four primary themes: work environment, physical health, psychological well-being and social connection. These enablers of well-being are illustrated in Figure 1.

Firstly, the work environment included structured organizational programs and support, positive team culture, supportive leadership and good communication. Secondly, physical health included physical activity, good nutrition, rest and relaxation, and engagement with healthcare services or therapeutic professionals. Thirdly, psychological well-being included engaging with professional support, practicing mindfulness, goal setting and self-reflection, and protecting time for hobbies, leisure and pets. Fourthly, social connection included time with family and friends, building friendships with work colleagues and giving back to the community.

5 | DISCUSSION

This study sought to determine the prevalence, predictors and changes over time of student nurses' and registered nurses' well-being, work well-being, illbeing and work illbeing, and to explore student nurses' and registered nurses' perceptions of well-being, and barriers and enablers of their well-being and work well-being. Our study design is novel in that it sought to provide a balanced assessment of the mental health continuum extending from both well-being to illbeing measurement before and during the first peak of coronavirus-19 in Australia. Alongside investigating illbeing such as stress, anxiety, depression and burnout, this study has also investigated what is going right for nurses' well-being such as flourishing, self-determination, resilience and work well-being.

There were limited similar samples identified which have used the same measures to address research question one (prevalence), these comparisons are reported in Table 4.

Many of the reported comparison studies using the same measures (a) changed the scoring procedures outlined by the original scale authors (e.g., calculated and reported totals rather than means) and (b) failed to report reliability in particular (e.g., Cronbach's alpha). The Victorian student and graduate nurses' well-being, work well-being, illbeing and work illbeing were of a similar prevalence to comparison groups for all but four of the variables; work burnout, emotional well-being, social well-being and psychological well-being. The Victorian nurses reported a higher degree of job burnout compared with 456 nurses from six private hospitals in Turkey (Basar & Basim, 2016). The Victorian nurses reported lower levels of emotional, social and psychological well-being compared with 361 Portuguese healthcare workers (Baylina et al., 2018). In a comprehensive literature search, no studies were identified with more relevant established comparable norms, similar to the findings of a recent systematic review of the quantitative research investigating graduate nurse well-being (Jarden, Jarden, Weiland, Taylor, Bujalka,
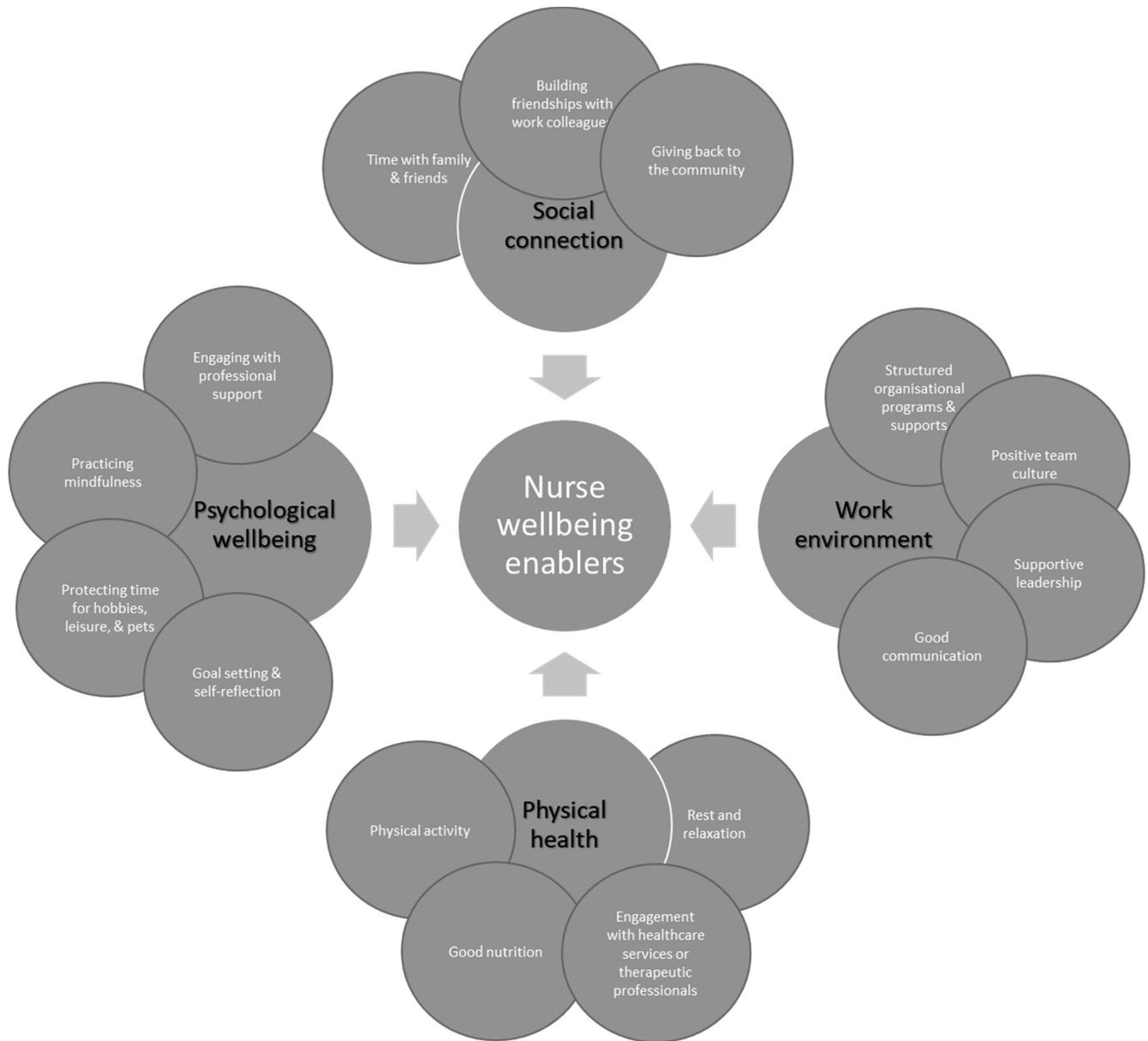
FIGURE 1 Nurse wellbeing enablers

Brockenshire, et al., 2021); however, our study provides a critical baseline of these measures going forward for the nursing workforce.

There were several strong correlations that have never before been identified, for example, a very strong positive correlation between Self-determination and Work Wellbeing where high levels of Self-determination were associated with high levels of Work Wellbeing, and a very strong negative correlation between Work Wellbeing and Flight Risk where low levels of Work Wellbeing were associated with high levels of Flight Risk. For the Nursing Work Index—Revised variables, there were several moderate correlations found, for example, a moderate positive correlation between Work Wellbeing and Nurse Manager Ability, Leadership and Support, and a moderate negative correlation between Burnout and Staffing and Resource Adequacy. For the one variable that changed over time, Collegial Nurse–Physician Relationships, relationships deteriorated. There may be some explanation for this in the

high value these nurses attributed to social connection in the free-text responses, and the limitations on social connection through physical distancing and personal protective equipment (PPE) use during coronavirus-19. Strong interprofessional relationships are recognized as fundamental to good patient care, yet underpinned by clinical workloads, organizational constraints and power relations (Matziou et al., 2014; Tang et al., 2018). During coronavirus-19, both workloads and healthcare organizations have been under significant strain (Al Thobaity & Alshammari, 2020), compounded by pre-existing staffing shortages (Lasater et al., 2021), potentially contributing to the deterioration of these nurse–physician relationships.

For the free-text responses, the three themes of physical health, psychological well-being and social connection being evident across both the characteristics and enablers of well-being is consistent with previous research findings for both nurses and wider professions

TABLE 4 Descriptive statistics of main study variables

Measure name (possible range)	Combined four samples (range), *M*, (*SD*), alpha	Comparison study, (range), *M*, (*SD*), alpha	Comparison
Work on Wellbeing			
WoW factor (0-100)	(18-100), *66.2, (16.1)*, .798	(2-100), *69.4, (14.3)* nil, [A]	Similar
Work wellbeing (0-100)	(18-98), *65.5, (14.0)*, .886	(14-99), *68.9, (13.2)* nil, [A]	Similar
Self-determination (0-100)	(17-100), *66.9, (16.7)*, .718	(0-100), *73.3, (14.1)* nil, [A]	Similar
Flight risk (0-100)	(0-92), *32.8, (22.4)*, .768	(0-94), *30.0, (18.6)* nil, [A]	Similar
Health and lifestyle (0-10)	(0-10), *6.1, (1.9)*, .843	(0-10), *6.4, (1.8)* nil, [A]	Similar
Flourishing Scale (8-56)	(29-56), *47.03, (5.96)*, .870	(8-56), *48.41, (5.61)*, nil, [B]	Similar
Nursing Work Index-Revised			
Staffing, resources (1-4)	(1.0-4.0), *2.50, (0.84)*, .886	nil, *2.40, (0.83)*, nil [C]	Similar
Manager ability, leadership, support (1-4)	(1.2-4.0), *2.93, (0.75)*, .844	nil, *2.51, (0.85)*, nil [C]	Similar
Collegial relationships (1-4)	(1.0-4.0), *3.11. (0.76)*, .947	nil, *2.84, (0.83)*, nil [C]	Similar
Ten-Item Personality Index			
Extraversion (1-7)	(1-7), *4.44, (1.51)*, .722	nil, *5.1, (1.1)*, nil, [D]	Similar
Agreeableness (1-7)	(2-7), *5.56, (1.17)*, .561	nil, *5.6, (1.0)*, nil, [D]	Similar
Emotional stability (1-7)	(2-7), *5.01, (1.41)*, .618	nil, *5.3, (1.2)*, nil, [D]	Similar
Conscientiousness (1-7)	(2-7), *6.16, (1.01)*, .613	nil, *6.2, (0.9)*, nil, [D]	Similar
Open to experience (1-7)	(3.5-7), *5.40, (1.01)*, .351	nil, *5.5, (1.0)*, nil, [D]	Similar
The burnout measure (1-7)	(1.2-5.5), *3.07, (1.04)*, .890	nil, *2.36, (1.2)*, nil, [E]	**Higher**
Brief Resilience Scale (0-60)	(14-60), *40.81, (11.38)*, .905	N/A	N/A
Mindful Attention Awareness Scale (1-6)	(1.60-5.87), *4.36, (0.83)*, .906	nil, *4.2, (0.9)*, nil, [F]	Similar
Depression, Anxiety, Stress Scale			
DASS total (0-63)	(0-42), *12.03, (9.82)*, .910	nil, *19.3, (18.6)*, nil [G]	Similar
Depression (0-21)	(0-16), *3.27, (4.07)*, .903	nil, *4.12, (7.32)*, nil, [H]	Similar
Anxiety (0-21)	(0-15), *3.04, (3.39)*, .757	nil, *3.23, (5.04)*, nil, [H]	Similar
Stress (0-21)	(0-21), *5.73, (4.05)*, .809	nil, *7.28, (7.13)*, nil, [H]	Similar
The Mental Health Continuum—Short Form			
MHC-SF total (0-70)	(19-70), *51.55, (11.65)*, .929	nil	nil
Emotional well-being (0-15)	(1-15), *11.98, (2.64)*, .898	(3-18), *14.72, (2.64)*, nil [I]	**Lower**
Social well-being (0-25)	(3-25), *15.97, (4.98)*, .818	(5-35), *20.06, (5.67)*, nil [I]	**Lower**
Psychological well-being (0-30)	(6-30), *23.60, (5.44)*, .906	(8-36), *28.90, (5.44)*, nil [I]	**Lower**

Notes: Current study determined to be "similar" if the mean was in half an *SD* of the comparison study mean, higher/lower if more than half the *SD* of the comparison study mean respective of direction. Higher and lower are presented in boldface; Abbreviations: nil = not reported; N/A = not available (i.e., an extended and more sensitive, response scale was used; 0-10 rather than 1-5); *Comparison studies*: [A] = Results provided from Work on Wellbeing Ltd, based on a random selection of 1,500 employed users, reliability statistic (alpha) not available; [B] = Drake et al. (2016), 227 patient care nurses, USA; [C] = Mihdawi et al. (2020), 350 RNs and midwives from inpatient units in public and private hospitals, Jordan; [D] = Williams et al. (2013), 174 surgical or medical nurses, UK; [E] = Basar and Basim (2016), 456 nurses from six private hospitals, Turkey; [F] = Vivian et al. (2019), 340 nurses in tertiary care medical centre, USA; [G] = Ferreira et al. (2020), 16 RNs, location unclear; [H] = Foureur et al. (2013), 28 RNs and midwives, Australia; [I] = Baylina et al. (2018), 361 healthcare workers, Portugal.

(Hone, Schofield, & Jarden, 2015; Jarden et al., 2018; Jarden, Sandham, Siegert, & Koziol-McLain, 2021). These three themes, alongside the importance of a positive workplace, work-life balance and the work environment, offer significant areas of opportunity for health promotion, and future workforce and policy development of multi-dimensional and multi-level workplace well-being programs (e.g., see Jarden et al., 2018).

Work, work environments and work roles are dynamic, never more so than in healthcare during a pandemic. The promotion and protection of health workers is underpinned by both local and global policy. Understanding the illbeing of these frontline workers' health has been at the forefront of research since coronavirus-19 was identified. There is an urgency to embed evidence-based well-being resources into workplaces that address what is going wrong and right for nurses before they are needed for the next inevitable pandemic. As a first step, relevant resources must be identified and then used to design work well-being programs tailored to these nurses to then implement and rigorously test.

5.1 | Limitations

The low response rate to our survey and a high dropout rate across the three timepoints contributed to the potential for sampling and attrition biases. Both low response rates and high dropout rates have become increasingly prevalent in electronic surveys (Dillman, 2020). Our efforts to mitigate these low response rates and high dropout rates were through (1) local champions being involved in recruitment, (2) e-mail reminders for follow-up and (3) participant prize incentives. However, our sample size was considerably less than predicted, as was the more than 50% dropout rate. Participant burden (e.g., already stretched workforce) and coronavirus-19 pressures may have been factors in the dropout rate; however, the low response rate to the first survey that was prior to coronavirus-19 in Victoria, Australia, may suggest otherwise. These limitations speak to larger issues that require attention if research into nurse well-being and mental health is to progress practice and policy changes. For example, low levels of participant engagement in the survey may not only be a reflection of participant fatigue but also these nurses' perceptions of the ability of health system to change in response to research relating to nurse well-being and mental health - a further opportunity for future exploration.

6 | CONCLUSIONS

During coronavirus-19, for a small sample of Australian nurses, Collegial Nurse–Physician Relationships deteriorated. These nurses were experiencing higher levels of burnout and lower levels of emotional, psychological and social well-being compared with other similar samples during pre-coronavirus-19 times. The three key areas of social connection, psychological well-being and physical health were perceived by these nurses as key characteristics and enablers of well-being. Specific to the workplace, these nurses felt their well-being was enabled through work-life balance, a positive workplace and the work environment. Investigating targeted interventions to address the perceived enablers of well-being, both in the workplace and outside of the workplace, is the next step.

AUTHORS' CONTRIBUTION

All authors have agreed on the final version and meet at least one of the following criteria (recommended by the ICMJE*): (1) substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; (2) drafting the article or revising it critically for important intellectual content. The first author (RJ) has contributed to this research inception, management, data collection, analysis, and drafting and editing the manuscript in its entirety. Author NB has contributed to data collection, analysis and revising, editing and approving the manuscript. Author AJ has contributed to project conception, analysis and revising, editing and approving the manuscript. Authors MG, TW and GT have contributed to project conception, revising, editing and approving the manuscript. Author MJ contributed to the statistical analysis. Authors MR, CC and KM have contributed to participant recruitment, revising, editing and approving the manuscript. *https://protect-au.mimecast.com/s/om4vCzvOL5hMEZPvmS4ou5Y?domain=icmje.org

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

DATA AVAILABILITY STATEMENT

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

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The research protocol was approved by the Melbourne Health Human Research Ethics Committee (HREC/56492/MH-2019; August 29, 2019), the University of Melbourne Human Research Ethics Committee (1954762.1; July 9, 2019) and the organizations' research governance offices. The research methods were conducted in accordance with relevant guidelines and regulations. Informed consent was obtained from all participants in this study.

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REFERENCES

Aiken, L., & Patrician, P. (2000). Measuring organizational traits of hospitals: The revised nursing work index. *Nursing Research*, *49*(3), 146–153.

Al Thobaity, A., & Alshammari, F. (2020). Nurses on the frontline against the COVID-19 pandemic: An integrative review. *Dubai Medical Journal*, *3*(3), 87–92. https://doi.org/10.1159/000509361

Asparouhov, T., & Muthén, B. (2010). Bayesian analysis using Mplus: Technical implementation. http://statmodel.com/download/Bayes3.pdf

Basar, U., & Basim, N. (2016). A cross-sectional survey on consequences of nurses' burnout: Moderating role of organizational politics. *Journal of Advanced Nursing*, *72*(8), 1838–1850. https://doi.org/10.1111/jan.12958

Baylina, P., Barros, C., Fonte, C., Alves, S., & Rocha, Á. (2018). Healthcare workers: Occupational health promotion and patient safety. *Journal of Medical Systems*, *42*(159), 1–8. https://doi.org/10.1007/s10916-018-1013-7

Bollen, K., & Curran, P. (2006). *Latent curve models: A structural equation perspective*. Wiley-Interscience.

Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners*. Sage.

Brown, K., & Ryan, R. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, *84*(4), 822–848.

Brunetto, Y., Xerri, M., Shriberg, A., Farr-Wharton, R., Shacklock, K., Newman, S., & Dienger, J. (2013). The impact of workplace relationships on engagement, well-being, commitment and turnover for nurses in Australia and the USA. *Journal of Advanced Nursing*, *69*(12), 2786–2799. https://doi.org/10.1111/jan.12165

Dall'Ora, C., Ball, J., Reinius, M., & Griffiths, P. (2020). Burnout in nursing: A theoretical review. *Human Resources for Health*, *18*, 1–17.

Department of Health and Human Services—Victoria. (2021). *Coronavirus (COVID-19) daily update*. https://www.dhhs.vic.gov.au/coronavirus-covid-19-daily-update

Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D. W., Oishi, S., & Biswas-Diener, R. (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social Indicators Research*, *97*(2), 143–156. https://doi.org/10.1007/s11205-009-9493-y

Dillman, D. (2020). Towards survey response rate theories that no longer pass each other like strangers in the night. In P. S. Brenner (Ed.), *Understanding survey methodology: Sociological theory and applications* (pp. 15–44). Springer International Publishing. https://doi.org/10.1007/978-3-030-47256-6_2

Dodge, R., Daly, A., Huyton, J., & Sanders, L. (2012). The challenge of defining wellbeing. *International Journal of Wellbeing*, *2*(3), 222–235. https://doi.org/10.5502/ijw.v2i3

Drake, D., & Steege, L. (2016). Interpretation of hospital nurse fatigue using latent profile analysis. *Advances in Nursing Science*, *39*(3), E1–E16. https://doi.org/10.1097/ANS.0000000000000130

Ferreira, B., Maharaj, S., Simpson, A., Nassif, N., & Lal, S. (2020). The metabolic role of depression and burnout in nurses. *Translational Metabolic Syndrome Research*, *3*, 9–11. https://doi.org/10.1016/j.tmsr.2020.03.002

Foureur, M., Besley, K., Burton, G., Yu, N., & Crisp, J. (2013). Enhancing the resilience of nurses and midwives: Pilot of a mindfulness-based program for increased health, sense of coherence and decreased depression, anxiety and stress. *Contemporary Nurse*, *45*(1), 114–125. https://doi.org/10.5172/conu.2013.45.1.114

Gelman, A., & Rubin, D. (1992). Inference from iterative simulation using multiple sequences. *Statistical Science*, *7*(4), 457–472. https://doi.org/10.1214/ss/1177011136

Gosling, S., Rentfrow, P., & Swann, W., Jr. (2003). A very brief measure of the big-five personality domains. *Journal of Research in Personality*, *37*(6), 504–528. https://doi.org/10.1016/S0092-6566(03)00046-1

Hone, L., Jarden, A., Duncan, S., & Schofield, G. (2015). Flourishing in New Zealand workers: Associations with lifestyle behaviors, physical health, psychosocial, and work-related indicators. *Journal of Occupational and Environmental Medicine*, *57*(9), 973–983. https://doi.org/10.1097/jom.0000000000000508

Hone, L., Schofield, G., & Jarden, A. (2015). Conceptualizations of wellbeing: Insights from a prototype analysis on New Zealand workers. *New Zealand Journal of Human Resource Management*, *15*(2), 97–118.

Huppert, F. (2009). Psychological well-being: Evidence regarding its causes and consequences. *Applied Psychology: Health and Well-Being*, *1*(2), 137–164.

International Council of Nurses. (2020). *International Council of Nurses Press Information*. Retrieved November 23, from https://www.icn.ch/news/icn-confirms-1500-nurses-have-died-covid-19-44-countries-and-estimates-healthcare-worker-covid

Jarden, R., Jarden, A., Weiland, T., Taylor, G., Brockenshire, N., Rutherford, M., Carbery, C., Moroney, K., & Gerdtz, M. (2021). Nurse wellbeing during the coronavirus (2019) pandemic: A qualitative descriptive study. *Collegian*, *28*(6), 709–719. https://doi.org/10.1016/j.colegn.2021.06.002

Jarden, R., Jarden, A., Weiland, T., Taylor, G., Bujalka, H., Brockenshire, N., & Gerdtz, M. (2021). New graduate nurse wellbeing, work wellbeing and mental health: A quantitative systematic review. *International Journal of Nursing Studies*, *121*, 1–35. https://doi.org/10.1016/j.ijnurstu.2021.103997

Jarden, R., Sandham, M., Siegert, R., & Koziol-McLain, J. (2018). Strengthening workplace wellbeing: Perceptions of intensive care nurses. *Nursing in Critical Care*, *24*(1), 15–23. https://doi.org/10.1111/nicc.12386

Jarden, R., Sandham, M., Siegert, R., & Koziol-McLain, J. (2021). General wellbeing of intensive care nurses: A prototype analysis. *Nusing in Critical Care*, 1–12. https://doi.org/10.1111/nicc.12706

Kaplan, D., & Depaoli, S. (2012). Bayesian structural equation modeling. In R. Hoyle (Ed.), *Handbook of structural equation modeling* (pp. 650–673). Guilford.

Keyes, C. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology*, *73*(3), 539–548. https://doi.org/10.1037/0022-006X.73.3.539

Keyes, C., Eisenberg, D., Perry, G., Dube, S., Kroenke, K., & Dhingra, S. (2012). The relationship of level of positive mental health with current mental disorders in predicting suicidal behavior and academic impairment in college students. *Journal of American College Health*, *60*(2), 126–133. https://doi.org/10.1080/07448481.2011.608393

Lake, E. (2002). Development of the practice environment scale of the nursing work index. *Research in Nursing and Health*, *25*(3), 176–188. https://doi.org/10.1002/nur.10032

Lake, E. (2007). The nursing practice environment: Measurement and evidence. *Medical Care Research and Review*, *64*(2), 104S–122S. https://doi.org/10.1177/1077558707299253

Lasater, K., Aiken, L., Sloane, D., French, R., Martin, B., Reneau, K., Alexander, M., & McHugh, M. (2021). Chronic hospital nurse understaffing meets COVID-19: An observational study. *BMJ Quality & Safety*, *30*, 639–647. https://doi.org/10.1136/bmjqs-2020-011512

Lovibond, S., & Lovibond, P. (1996). *Manual for the depression anxiety stress scales* (2nd ed.). Psychology Foundation of Australia.

MacKillop, J., & Anderson, E. (2007). Further psychometric validation of the mindful attention awareness scale (MAAS). *Journal of Psychopathology and Behavioral Assessment*, *29*(4), 289–293.

Malach-Pines, A. (2005). The burnout measure, short version. *International Journal of Stress Management*, *12*(1), 78–88. https://doi.org/10.1037/1072-5245.12.1.78

Matziou, V., Vlahioti, E., Perdikaris, P., Matziou, T., Megapanou, E., & Petsios, K. (2014). Physician and nursing perceptions concerning interprofessional communication and collaboration. *Journal of Interprofessional Care*, *28*(6), 526–533. https://doi.org/10.3109/13561820.2014.934338

Mihdawi, M., Al-Amer, R., Darwish, R., Randall, S., & Afaneh, T. (2020). The influence of nursing work environment on patient safety. *Workplace Health & Safety*, *68*(8), 384–390. https://doi.org/10.1177/2165079920901533

Muthén, B., Muthén, L., & Asparouhov, T. (2017). *Regression and mediation analysis using Mplus*. Muthén & Muthén.

Organization of Economic Cooperation and Development. (2015). *How's life? 2015: Measuring well-being*. OECD Publishing. https://doi.org/10.1787/how_life-2015-en

Parker, D., Tuckett, A., Eley, R., & Hegney, D. (2010). Construct validity and reliability of the practice environment scale of

the nursing work index for Queensland nurses. *International Journal of Nursing Practice*, *16*(4), 352–358. https://doi.org/10.1111/j.1440-172X.2010.01851.x

Ray-Sannerud, B., Leyshon, S., & Vallevik, V. (2015). Introducing routine measurement of healthcare worker's well-being as a leading indicator for proactive safety management systems based on resilience engineering. *Procedia Manufacturing*, *3*, 319–326. https://doi.org/10.1016/j.promfg.2015.07.163

Ryan, R., & Deci, E. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, *52*, 141–166. https://doi.org/10.1146/annurev.psych.52.1.141

Ryff, C. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, *57*(6), 1069–1081.

Schaufeli, W., & Van Dierendonck, D. (1993). The construct validity of two burnout measures. *Journal of Organizational Behavior*, *14*(7), 631–647. https://doi.org/10.1002/job.4030140703

Singer, J., Willett, J., & Eliot, C. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. Oxford University Press.

Smith, B., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The brief resilience scale: Assessing the ability to bounce back. *International Journal of Behavioral Medicine*, *15*(3), 194–200. https://doi.org/10.1080/10705500802222972

Tang, C., Zhou, W., Chan, S., & Liaw, S. (2018). Interprofessional collaboration between junior doctors and nurses in the general ward setting: A qualitative exploratory study. *Journal of Nursing Management*, *26*(1), 11–18. https://doi.org/10.1111/jonm.12503

Vivian, E., Oduor, H., Arceneaux, S. R., Flores, J. A., Vo, A., & Madson Madden, B. (2019). A cross-sectional study of perceived stress, mindfulness, emotional selfregulation, and self-care habits in registered nurses at a tertiary care medical center. *SAGE Open Nursing*, *5*, 2377960819827472. https://doi.org/10.1177/2377960819827472

Waters, L., Algoe, S., Dutton, J., Emmons, R., Fredrickson, B., Heaphy, E., Moskowitz, J., Neff, K., Niemiec, R., Pury, C., & Steger, M. (2022). Positive psychology in a pandemic: Buffering, bolstering, and building mental health. *The Journal of Positive Psychology*, *3*(12), 303–323. https://doi.org/10.1080/17439760.2021.1871945

Williams, G., Dean, P., & Williams, E. (2009). Do nurses really care? Confirming the stereotype with a case control study. *British Journal of Nursing*, *18*(3), 162–165. https://doi.org/10.12968/bjon.2009.18.3.39044

Wise, F., Harris, D., & Olver, J. (2017). The DASS-14: Improving the construct validity and reliability of the depression, anxiety, and stress scale in a cohort of health professionals. *Journal of Allied Health*, *46*(4), E85–E90.

Wong, A., Olusanya, O., Parulekar, P., & Highfield, J. (2020). Staff wellbeing in times of COVID-19. *Journal of the Intensive Care Society*, *0*(0), 1–7. https://doi.org/10.1177/1751143720968066

World Health Organization. (2020). *State of the world's nursing 2020: Investing in education, jobs and leadership*. World Health Organization. https://www.who.int/publications/i/item/9789240003279

Zangaro, G., & Jones, K. (2019). Practice environment scale of the nursing work index: A reliability generalization meta-analysis. *Western Journal of Nursing Research*, *41*(11), 1658–1684. https://doi.org/10.1177/0193945918823779

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.