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Title

Evaluation of the Brief COPE scale and exploration of coping among primary healthcare nurses' during COVID-19

Running Title

Psychometric Evaluation of the Brief COPE scale

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Abstract

Aim: To explore primary health care nurses' coping strategies and evaluate the psychometric properties of the Brief COPE scale.

Background: Primary health care nurses are experiencing significant COVID-19-related psychological impacts. Beyond understanding the impacts, there is a need to explore coping strategies.

Methods: This online cross-sectional survey was completed by 359 Australian primary health care nurses between October and December 2020.

Results: Factor analysis revealed seven factors (support, disengagement and venting, humour, positive reframing, acceptance, substance use, and spiritual/religious beliefs)(Cronbach's alpha >0.69). There was an association between age, years of nursing and years of primary health care nursing and the factors of 'support', 'disengagement and venting' and 'positive reframing'. Years of experience were also associated with the factor 'humour'. Urban respondents had higher scores for the 'support' factor.

Conclusions: The Brief COPE scale is a valid and reliable tool for assessing primary health care nurses' coping. As demographic characteristics impact the coping strategies that nurses use, supports need to be tailored to optimise their impact.

Implications for nursing management: Nurse managers need to consider the workforce demographics when designing and implementing support strategies. The Brief COPE can identify current coping strategies and inform interventions to build coping capacity.

Keywords

pandemic, nursing workforce, coping, primary healthcare, mental health, community

1. Introduction

The impact of COVID-19, and previous respiratory epidemics, on nurses' psychological well-being, has been well documented (Fernandez et al., 2020; Fernandez et al., 2021). In previous pandemics and epidemics, nurses globally have reportedly experienced increased levels of job stress leading to burnout and workforce attrition (Fernandez et al., 2020). During the COVID-19 pandemic, hospital-based nurses are experiencing significant anxiety and depression across the globe (Fernandez et al., 2021; Labrague & Santos, 2020; Tokac & Razon, 2021). There has been far less reported about the psychological impacts of the pandemic on nurses working outside of the hospital setting (Ashley et al., 2021b; Crowley et al., 2021; Selçuk Tosun, Akgül Gündoğdu, & Taş, 2021), yet this group is likely at high risk of psychological sequelae (Monsalve-Reyes et al., 2018).

Nurses are fearful of contracting respiratory pathogens and spreading these to family and friends (Ashley et al., 2021a). They are also stressed by inadequate personal protective equipment (PPE) for their role, poor and inconsistent communication, and limited job security (Ashley et al., 2021b; Crowley et al., 2021; Halcomb et al., 2020; Labrague & Santos, 2021). The International Council of Nurses (2021) has identified the potential for such stressors to negatively impact nurses' job satisfaction and prompt them to consider leaving the profession, thus compounding existing workforce issues. Substantial loss of the nursing workforce has significant implications for nursing workload, service delivery, quality and safety of care, and health outcomes (Halcomb et al., 2020). By understanding the psychological impact of COVID-19 on nurses, healthy coping mechanisms to ameliorate or manage associated stressors can be implemented. This understanding can inform the strategies implemented by nurse managers and nurses themselves to adapt to and optimize the work environment (Middleton et al., 2021).

Much of the literature on the impact of the COVID-19 pandemic on the psychological well-being of nurses has focused on nurses employed in acute hospitals (Halcomb et al., 2022; Labrague & Santos, 2020; Lorente, Vera, & Peiró, 2021). However, nurses who work in community-based, primary health care settings are also exposed to pandemic-related stressors that can impact their wellbeing, job satisfaction, and intention to leave (Ashley et al., 2021b; Crowley et al., 2021; Halcomb et al., 2020). In

Australia, like many industrialized countries, the primary health care sector consists of a diverse range of community-based health settings, general/family practices, government-funded and non-government not-for-profit organisations (Australian Government Department of Health, 2018). Primary health care nurses comprise some 28% of the Australian clinical nursing workforce (Australian Institute of Health and Welfare, 2016) and operate in varying models of care. While community health services are State or Territory government-funded and are often extensions of hospital-based care, general practices are operated as small businesses or corporate chains and employ relatively small numbers of nurses. Given their important role in the health care system and on the health of the community (WHO and UNICEF, 2018), the workforce issues experienced by primary health care nurses are of importance. Models of nursing leadership are variable across PHC settings depending on the size and structure of the nursing workforce. Nevertheless, nurse managers and leaders must be empowered with evidence to support their advocacy for the needs of nurses working in primary health care.

Internationally, primary health care nurses play a vital role during a pandemic in providing infection control education, screening undifferentiated symptomatic people, supporting vulnerable community members and reducing the demand for acute hospital services (World Health Organization, 2020). In addition to their role in pandemic management, primary health care nurses support ongoing health care in the community for non-pandemic related health issues, including managing acute presentations and chronic conditions, providing preventive care, and supporting end-of-life care (Halcomb et al., 2020).

Coping is a cognitive or behavioural action undertaken to manage or reduce the impact of events that individuals perceive to be affecting their wellbeing (Dimunová, Běrešová, Raková, Rónyová, & Fertařová, 2020). While coping is often considered to equate to any successful management of a stressor, it is generally defined as any strategy that people use to manage stress (Kannis-Dymand, Millear, Sharman, & Carter, 2020). Coping strategies are how nurses manage the challenging situations that they face. Adaptive or problem-focused coping strategies focus on the problems and emotions, while maladaptive or emotionally focused strategies focus on avoidance (Dimunová et al., 2020). Successful coping leads to greater, positive long-term mental health outcomes and leads to improved long-term well-being after a significant life

event (Carver et al., 1993; Kannis-Dymand et al., 2020). The absence of successful coping strategies is associated with a greater frequency of ongoing mental health issues including anxiety, depression, and post-traumatic stress disorder (Kannis-Dymand et al., 2020).

The Coping Orientation to Problems Experienced (COPE) scale was originally developed by Carver, Scheier, and Weintraub (1989), informed by the model of coping described by Lazarus and Folkman (1984). The COPE scale is an extensively used self-report coping measure that has been used across numerous stressful situations and in various population groups (Kannis-Dymand et al., 2020). More recently, the 28-item Brief COPE has been developed to reduce respondent burden by reducing the number of items in the tool (Carver, 1997). The Brief COPE has been used extensively in studies of coping in nurses (Abdul Rahman, Bani Issa, & Naing, 2021; Dimunová et al., 2020; Lee, Tzeng, & Chiang, 2019), although none of these have been with nurses specifically working in PHC. The items of the Brief COPE have been reported to represent 14 distinct coping strategies, namely; denial, active coping, substance use, behavioural disengagement, use of emotional support, venting, use of instrumental support, religion / spiritual beliefs, positive reframing, planning, self-distraction, humour, acceptance, and self-blame (Carver, 1997).

The presence of 14 coping strategies within the Brief COPE measure can present challenges for analyses (Baumstarck et al., 2017). While some authors advocate that the measure's coping strategies should be dichotomized into adaptive and maladaptive strategies (Baumstarck et al., 2017), others argue that this is not appropriate (Lee et al., 2019). Additionally, the factor structure has been debated in the literature, with inconsistent approaches to analysis and various factor structures proposed (Baumstarck et al., 2017; Kannis-Dymand et al., 2020). While Carver (1997) initially reported a nine-factor structure that accounted for 72.4% of the variance, Kannis-Dymand et al. (2020) identify factor structures for the Brief COPE ranging from 1–12 factors. Given the diversity in factor structures reported, this paper seeks to explore the Brief COPE in a sample of Australian primary health care nurses during the COVID-19 pandemic. Such psychometric exploration will provide evidence for the factor structure and reliability of the Brief COPE in this group and thus can be used with confidence to measure the coping mechanisms in primary health care nurses.

2. Methods

2.1 Research design

During October and December 2020, an online survey was distributed to nurses employed in Australian primary health care settings. At this time, the second wave of COVID-19 in the state of Victoria had resolved and there were few COVID-19 cases across Australia. This prompted reductions in social distancing rules and movement restrictions and a trans-Tasman travel bubble created opportunities for trips to New Zealand.

2.2 Participants

Respondents were nurses working in primary health care across Australia. This included Enrolled Nurses (EN)(Diploma-prepared), Registered Nurses (RN)(Baccalaureate-prepared or equivalent) and Nurse Practitioners (NP)(Masters-prepared). Primary health care settings were any context where nurses worked outside of the hospital system and included any health services based in the community (e.g. schools and universities, prisons, and children's health centres), community nursing services, and general practice.

Social media (Facebook, LinkedIn and Twitter) was used to disseminate information about the survey and a direct link to participate. Additionally, emails and newsletters from national nursing organisations (e.g. Australian College of Nursing and Australian Primary Health Care Nurses Association) provided study information and a survey link. As there is no register of Australian nurses specifically working in primary health care, such convenience sampling is the only realistic strategy to facilitate the recruitment of this group (Authors own).

To calculate sample size the principles described by Kline (2015) were used. This requires 10 participants for each item in the instrument. Given the 28 items within the Brief COPE scale this equates to a minimum sample required of 280.

2.3 Instrument

Based on a review of the literature, COVID-19 research undertaken previously by the research team (Authors Own) and expert input, a survey tool was developed. The tool combined validated scales and investigator-developed items in four discrete sections. Section one explored the demographic and employment characteristics of respondents. Items in section two explored respondents' lifestyle behaviours,

perceptions of safety, support, and COVID-19 concerns. Section three measured respondents' emotional state using the Depression Anxiety Stress Scales (DASS-21)(Henry & Crawford, 2005) and coping strategies using the 28-item Brief COPE scale (Carver, 1997). Each item of the Brief COPE is rated on a 4-point Likert scale from 'I haven't been doing this at all' to 'I've been doing this a lot'. The extent to which respondents' emotions were related to COVID-19 was also captured. In the final section of the tool, the quality-of-care delivery was evaluated by measuring respondents' perceptions of the impact of COVID-19 and the safe and effective staffing tool (Borneo, Helm, & Russell, 2017). The tool was pilot tested by a group of nurse researchers with expertise in primary health care nursing before dissemination.

Given the volume of disparate data gathered from the survey, this paper reports solely on the validation and exploration of the Brief COPE scale. Additional detail on other sections of the survey tool and findings related to nurses' mental health, safety, and support and the impact of COVID-19 on quality of care are reported elsewhere (Authors Own).

2.4 Data analysis

Following the export of survey data from Qualtrics into SPSS[®] Version 25.0, data were checked to identify respondents who did not meet the inclusion criteria of being employed in primary health care and any missing data. Data relating to respondent demographics were summarized using means, frequency distributions and standard deviations. The data were dichotomized at the mean for further analysis.

Best practices in Exploratory Factor Analysis were used to evaluate the construct validity of the Brief COPE. This included (1) assessment of the response distribution using frequency, mean and standard deviations for the response options for every item; (2) affirmation of non-violation of the assumptions of normality, multi-collinearity, and linearity; (3) exploratory factor analysis using Principal Components Analysis followed with Varimax Rotation (Williams, Brown, & Onsmann, 2012). Inspection of the scree plots against established criteria informed extraction of components (Kaiser, 1960). Item loading was deemed large if greater than or equal to 0.80, moderate if between 0.79 and 0.41, and small if ≤ 0.40 .

The internal consistency of each subscale and the overall scale was determined using Cronbach's alpha. Values ≥ 0.9 were deemed excellent, 0.8 - < 0.9 good, those 0.7- < 0.8 were considered acceptable, while values between 0.6 - < 0.7 were questionable, 0.5 - < 0.6 were poor and < 0.5 unacceptable (Tavakol & Dennick, 2011). The factors identified were appropriately titled to reflect the underlying constructs of the Brief COPE. The differences between the demographic variables and coping factors were evaluated using t-tests, and one-way analysis of variance (ANOVA) with Bonferroni correction for multiple comparisons. Statistical significance was set at $p < 0.05$.

2.5 Ethical considerations

The Human Research Ethics Committees at the University of XXX (Approval Number HEXX) and the University of XXX approved the conduct of the study. Survey completion implied consent. Participation could be ceased at any time by exiting the survey.

4. Results

4.1 Respondents

Three hundred and fifty-nine primary health care nurses completed the survey. Most respondents were female (95.0%; $n=341$) and employed as Registered Nurses (86.1%; $n=320$) (Table 1). Thirty respondents (8.4%) were Enrolled Nurses and 6 respondents (1.7%) were nurse practitioners. Slightly fewer than half of the respondents worked in general practice (46.5%; $n=167$). While 44% ($n=158$) respondents worked part-time, only 35.1% ($n=126$) worked full-time as the remaining 20.8% ($n=75$) were employed as a casual or on a contract.

****INSERT TABLE 1 HERE****

4.2 Exploratory factor analysis

As the Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.851 and Bartlett's test of sphericity reached statistical significance ($\chi^2=4396.142$, $p=0.000$) the data were considered suitable for factor analysis (Tabachnick & Fidell, 2014). The analysis demonstrated a seven-factor solution with eigenvalues greater than one, accounting for 65.2% of the total variance. A clear departure from linearity, consistent with a seven-factor solution, was evident on the scree plot.

Twenty-six of the 28 items had factor loadings above than 0.4 (Table 2). The other two items, 'I've been doing something to think about it less, such as watching movies, TV, reading or sleeping' and 'I've been turning to work or other activities to take my mind off things', had factor loadings of 0.33 and 0.35 respectively. The factors were descriptively labelled support (5 items), disengagement and venting (8 items), positive reframing (6 items), humour (3 items), acceptance (2 items), substance use (2 items) and religion / spiritual beliefs (2 items)(Table 2). Based on previous literature reporting the Brief COPE (Kannis-Dymand et al., 2020), the factors were further classified and defined. Factor 1 'support' reflected emotion-focused coping, with items around "seeking emotional support or guidance from others" (Kannis-Dymand et al., 2020, p. 131). Factor 2 'disengagement and venting' reflected unhealthy coping strategies (e.g. denial, avoidance). Problem-focused coping was demonstrated in Factor 3 'positive reframing', Factor 4 'humour', and Factor 5 'acceptance'. Items across these 3 factors focused on respondents actively seeking to either find a solution or adapt to the situation.

****INSERT TABLE 2 HERE****

4.3 *Internal consistency*

The internal consistency of the total Brief COPE was high ($\alpha=0.903$, $M=38.2$). The Cronbach's alpha for the seven factors, support, disengagement and venting, positive reframing, humour, acceptance, substance use, and religion / spiritual beliefs were 0.814, 0.810, 0.834, 0.738, 0.694, 0.923, and 0.855 respectively (Table 3).

****INSERT TABLE 3 HERE****

4.4 *Validation*

Items in Factor two 'disengagement and venting' all revealed a directionality opposed to the logic of the construct being measured. Therefore, for the final analysis, all items in Factor 2 were reverse coded so that a high value indicated the same response type on every item across the scale. The scores of the total Brief COPE were computed as a sum of the scores of all the factors. The mean total score for the total Brief COPE was 68.48 (± 9.28). The mean scores for the individual factors are shown in Table 3.

4.5 *Association between demographics and coping strategies*

Respondents aged over 60 years, those with ≥ 21 years' nursing experience and those ≥ 13 years' primary health care nursing experience had significantly lower scores for the coping strategies relating to Factor 1 'support' and Factor 3 'positive reframing' (Table 4). Respondents with ≥ 21 years' nursing experience also had significantly lower scores for the coping strategies relating to Factor 4 'humour' (Mean 5.56 ± 2.08) compared with those who had ≤ 20 years' experience as a nurse.

****INSERT TABLE 4 HERE****

Those respondents older than 60 years, with ≥ 21 years' nursing experience or with ≥ 13 years' primary health care nursing experience had higher scores for the coping strategies relating to Factor 2 'disengagement and venting' (Mean 29.96 ± 2.32) compared to other respondents. Respondents who worked in a metropolitan area had significantly higher scores for the coping strategies relating to Factor 1 'support' compared to those who worked in rural and remote settings. However, those who worked part-time had significantly higher scores for substance abuse.

There was no statistically significant association between age, or years of nursing experience or years of experience as a primary health care nurse or location of workplace and the total Brief COPE or the remaining factors.

5. Discussion

This study has provided an evaluation of the psychometric properties of the Brief COPE among Australian primary health care nurses during the COVID-19 pandemic and explored the impact of demographics on the coping styles used. The pandemic has been demonstrated to have had a significant psychosocial impact on these nurses (Authors Own)(Crowley et al., 2021). Therefore, ensuring that they are utilising effective coping strategies is important to minimise negative sequelae, such as burnout, that may result in nurses leaving the profession. Such findings are important to the global nursing workforce. The results of this study have added to the literature by demonstrating the desirable psychometric properties of Brief COPE among primary health care nurses in the context of a pandemic. This study has confirmed the applicability of the Brief COPE to assess the coping strategies of primary health care nurses in other settings. It has also highlighted the differences in coping between nurses with different demographics. This is vital information for nurse managers to understand when designing and implementing support strategies for nurses in the

clinical setting to ensure that these strategies meet the needs of individuals and groups. It also helps to demonstrate that a one-size support intervention may not suit all primary health care nurses. These findings have implications for nurses working in primary health care settings internationally.

While this study demonstrated a 7-factor solution, the factors were conceptually similar to those identified in other studies. In those studies which report fewer factors (Carver, 1997; Kannis-Dymand et al., 2020), there is less discrimination, with more items loaded together on a single factor. However, in those studies which found a greater number of factors, aspects such as humour and substance use were identified as individual factors (Carver, 1997; Kannis-Dymand et al., 2020; Tang, Chan, Ng, & Yip, 2016).

Findings from this study demonstrated that older respondents and those with greater nursing and primary health care experience used emotional and instrumental social support from others less than younger or less experienced respondents. Social support has been widely reported as a coping strategy employed by Australian nurses in the literature, with access to a social support network shown to enhance resilience, reduce job stress and increase job satisfaction (Labrague & Santos, 2020; Lim, Bogossian, & Ahern, 2010). There is conflicting evidence about the relationship between age and the use of emotional and instrumental support. This finding highlights a need for future research to explore intergenerational differences to understand how these might impact strategies required to support individuals and groups within the nursing workforce.

Additionally, those respondents who were living in a rural area had significantly lower use of emotional and instrumental support from others than those in metropolitan areas. Differences in emotional responses and coping strategies between nurses living in urban and rural areas have been previously reported in the international literature (Fluharty & Fancourt, 2021; Huang, Lei, Xu, Liu, & Yu, 2020). This has been linked to perceived differences in population density and disease risk, as well as health resources and workforce constraints. Given the existing disparities in the mental health of people living in rural areas and difficulties recruiting nurses to work in these locations (Smith, Sim, & Halcomb, 2019), there is a need to ensure that strategies are implemented to ensure that emotional and instrumental support from others is accessible in rural areas.

Factor 3 'Positive reframing' included items from the original Brief COPE that comprised the subscales of active coping, planning and positive reframing. These strategies are generally considered to represent problem focussed coping strategies, that is, behaviours that seek to change the situation and/or remove the stressor (Dimunová et al., 2020; Lazarus, 1993). These kinds of problem-solving coping strategies are known to be the most effective in dealing with stress in the longer term (Lim et al., 2010). In this study, older respondents, and those with greater experience as a nurse and as a primary health care nurse used positive reframing less than younger or less experienced respondents. This serves to further highlight the need to consider generational contexts and explore strategies to suit the spectrum of the nursing workforce.

Items within the factor 'disengagement and venting' represent dysfunctional or unhealthy coping behaviours such as denial, avoidance or giving up. Our findings reveal that older respondents and those with more nursing and primary health care experience used these strategies more than younger and less experienced respondents. The use of dysfunctional strategies by nurses has been previously reported, particularly in high-workload environments (Dimunová et al., 2020). In their study of critical care nurses, Alharbi, Jackson, and Usher (2020) found greater use of avoidant coping strategies in those aged over 35 years. While these strategies can sometimes reduce stressors in the short term by distancing oneself from the stressful situation, they do not address the underlying cause (Dimunová et al., 2020) and can be negatively correlated to quality of life (Baumstarck et al., 2017) and be associated with poorer longer-term mental health and wellbeing outcomes (Lim et al., 2010).

Findings from this study demonstrated that older participants, those with longer work experience as a nurse and as a primary health care nurse used significantly different coping strategies than younger or less experienced nurses. There remains little evidence regarding the association between age and coping mechanisms (Chen, Peng, Xu, & O'Brien, 2018). While some studies report that older adults are more likely to use emotion-focused coping (Chen et al., 2018), others found that age is independent of coping strategies (Baumstarck et al., 2017). Findings from this study highlight that there is a need to consider focused support strategies based on demographic factors such as age and experience level to meet the needs of various groups. Given the importance of retaining nurses across the age and experience

spectrum to maintain skill mix, further research is needed to examine age, stress and coping among nurses. Since the older and more experienced respondents in this study were using less support from others and positive reframing and more unhealthy strategies, there is an urgent need for nurse managers, employers and policymakers to respond. Interventions should target this group to support them to develop more problem focussed strategies to optimise their mental health and well-being outcomes.

6. Limitations

This study has several limitations. Despite the national approach to data collection, data were not evenly distributed across the country. However, there can be some confidence in the generalisability given the representation across both rural and metropolitan areas. Given the use of self-report data can result in social desirability bias, this may be a study limitation. Although the collection of data during the COVID-19 pandemic meant that data were collected in real-time and not impacted by recall bias, participation rates may have been influenced by the methods of convenience sampling, use of online survey delivery and the limited data collection period. While the use of numerous social media platforms and several professional nursing organisations were intended to maximise reach, it may also have limited access to the survey for those disconnected from such networks. Given the disparate and numerous employers, without a register of nurses working in primary health care, this was the only feasible approach to recruit this group of nurses. At the time of the study, Australia was experiencing relatively low case numbers of COVID-19. Further research during periods of higher prevalence may extend and confirm the findings of this paper.

7. Conclusions

The Brief COPE scale is a reliable and valid measure of assessing coping among primary health care nurses. A seven-factor solution emerged from this study to identify the coping mechanisms seen in this group. Data about primary health care nurses coping highlighted the need to be cognizant of the impact of age, experience and rurality on the types of coping strategies used. Primary health care organisations and nurse managers need to use this information to assess coping in their workforce and implement strategies to promote positive coping by capitalising on adaptive coping strategies that meet individual needs. This is vital to promote the well-being and retention of the primary health care nursing workforce. As the world emerges from COVID-19 it is important that research continues to be undertaken to track the

psychological impacts and coping mechanisms of primary care nurses over time to optimise workforce outcomes and promote preparedness for future events.

8. Implications for Nursing Management

This study has provided validation of the Brief COPE as a valid and reliable measure of coping among primary health care nurses. While the study was conducted in one country these findings have implications internationally. Given the significant mental health impacts of the COVID-19 pandemic and the importance of the primary health care nursing workforce to the health of the community, understanding their coping mechanisms is vital to inform future support strategies.

Nurse managers play a key role in assessing current coping mechanisms and identifying areas where additional support could ensure that coping mechanisms are optimised to build resilience. This requires nurse managers to actively engage with individual primary health care nurses to open the discussion about mental well-being and coping. These discussions could prompt consideration of support plans for individuals or groups of nurses. This study has highlighted that both the nurses' age, experience and rurality of location affect the types of coping strategies used. This reinforces the need for nurse managers to consider the individual nurses within their staff to ensure that these differences are considered and incorporated in the development and implementation of support strategies.

Within the broader workplace context, nurse managers can support primary health care nurses by ensuring that workplaces themselves foster positive coping strategies. Nurse managers should advocate to ensure that workplaces provide the support, education and space to enable and foster positive coping.

References

- Abdul Rahman, H., Bani Issa, W., & Naing, L. (2021). Psychometric properties of brief-COPE inventory among nurses. *BMC Nursing, 20*(1). doi:10.1186/s12912-021-00592-5
- Alharbi, J., Jackson, D., & Usher, K. (2020). Personal characteristics, coping strategies, and resilience impact on compassion fatigue in critical care nurses: A cross-sectional study. *Nursing & Health Sciences, 22*(1), 20-27. doi:10.1111/nhs.12650
- Ashley, C., James, S., Stephen, C., Mursa, R., McInnes, S., Williams, A., . . . Halcomb, E. (2021a). Primary health care nurses' perceptions of risk during COVID-19: a qualitative study. *Journal of Nursing Scholarship, 53*(6), 689-697. doi:10.1111/jnu.12698
- Ashley, C., James, S., Williams, A., Calma, K., McInnes, S., Mursa, R., . . . Halcomb, E. (2021b). The psychological well-being of primary health care nurses' during COVID-19: A qualitative study. *Journal of Advanced Nursing, 77*(9), 3820-3828. doi:10.1111/jan.14937
- Australian Government Department of Health. (2018). Fact Sheet: Primary Health Care. Retrieved from <https://www1.health.gov.au/internet/main/publishing.nsf/Content/Fact-Sheet-Primary-Health-Care>
- Australian Institute of Health and Welfare. (2016). *Nursing and midwifery workforce 2015*. Canberra, ACT:
- Baumstarck, K., Alessandrini, M., Hamidou, Z., Auquier, P., Leroy, T., & Boyer, L. (2017). Assessment of coping: a new french four-factor structure of the brief COPE inventory. *Health Qual Life Outcomes, 15*(1), 8. doi:10.1186/s12955-016-0581-9

Borneo, A., Helm, C., & Russell, J. (2017). *Safe and effective staffing: nursing against the odds*. London:Royal College of Nursing.

Carver, C. S. (1997). You want to measure coping but your protocol' too long: Consider the brief cope. *International Journal of Behavioral Medicine*, 4(1), 92-100. doi:10.1207/s15327558ijbm0401_6

Carver, C. S., Pozo, C., Harris, S. D., Noriega, V., Scheier, M. F., Robinson, D. S., . . . Clark, K. C. (1993). How coping mediates the effect of optimism on distress: a study of women with early stage breast cancer. *J Pers Soc Psychol*, 65(2), 375-390. doi:10.1037//0022-3514.65.2.375

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: a theoretically based approach. *Journal of personality and social psychology*, 56(2), 267.

Chen, Y., Peng, Y., Xu, H., & O'Brien, W. H. (2018). Age Differences in Stress and Coping: Problem-Focused Strategies Mediate the Relationship Between Age and Positive Affect. *The International Journal of Aging and Human Development*, 86(4), 347-363. doi:10.1177/0091415017720890

Crowley, T., Kitshoff, D., De Lange-Cloete, F., Baron, J., De Lange, S., Young, C., . . . Couper, I. (2021). Primary care nurses' preparedness for COVID-19 in the Western Cape province, South Africa. *African Journal of Primary Health Care & Family Medicine*, 13(1). doi:10.4102/phcfm.v13i1.2879

Dimunová, L., Bérešová, A., Raková, J., Rónyová, I., & Fertal'ová, T. (2020). The relationship between self-esteem of nurses and their choice of strategies to cope with workload burden. *Central European Journal of Nursing and Midwifery*, 11(3), 130-135. doi:10.15452/cejnm.2020.11.0023

Fernandez, R., Lord, H., Halcomb, E. J., Moxham, L., Middleton, R., Alananzeh, I., & Ellwood, L. (2020). Implications for COVID-19: a systematic review of nurses' experiences of working in acute care hospital settings during a respiratory

pandemic. *International Journal of Nursing Studies*, 111.

doi:10.1016/j.ijnurstu.2020.103637

Fernandez, R., Sikhosana, N., Green, H., Halcomb, E., Middleton, R., Alananzeh, I., . . . Moxham, L. (2021). Anxiety and depression among healthcare workers during the COVID-19 pandemic: a systematic umbrella review of the global evidence. *BMJ Open*, 11(9), e054528. doi:10.1136/bmjopen-2021-054528

Fluharty, M., & Fancourt, D. (2021). How have people been coping during the COVID-19 pandemic? Patterns and predictors of coping strategies amongst 26,016 UK adults. *BMC Psychology*, 9(1). doi:10.1186/s40359-021-00603-9

Halcomb, E., Fernandez, R., Mursa, R., Stephen, C., Calma, K., Ashley, C., . . . Williams, A. (2022). Mental health, safety and support during COVID-19: A cross-sectional study of primary health care nurses. *Journal of Nursing Management*, 30(2), 393-402. doi:10.1111/jonm.13534

Halcomb, E., McInnes, S., Williams, A., Ashley, C., James, S., Fernandez, R., . . . Calma, K. R. B. (2020). The experiences of primary health care nurses during the COVID-19 pandemic in Australia. *Journal of Nursing Scholarship*, 52(5), 553-563. doi:10.1111/jnu.12589

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British journal of clinical psychology*, 44(2), 227-239.

Huang, L., Lei, W., Xu, F., Liu, H., & Yu, L. (2020). Emotional responses and coping strategies in nurses and nursing students during Covid-19 outbreak: A comparative study. *PLOS ONE*, 15(8), e0237303. doi:10.1371/journal.pone.0237303

International Council of Nurses. (2021). *International Council of Nurses COVID-19 Update*. Geneva, Switzerland:ICN.

Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement, 20*(1), 141-151.

Kannis-Dymand, L., Millear, P. M., Sharman, R., & Carter, J. D. (2020). Factor structure of the Brief COPE in a population from Australia and New Zealand exposed to a disaster. *Australasian Journal of Disaster and Trauma Studies, 24*(2), 125-137.

Kline, R. B. (2015). *Principles and practice of structural equation modeling*: Guilford publications.

Labrague, L. J., & Santos, J. A. A. (2020). COVID-19 anxiety among front-line nurses: Predictive role of organisational support, personal resilience and social support. *Journal of Nursing Management, 28*(7), 1653-1661. doi:10.1111/jonm.13121

Labrague, L. J., & Santos, J. A. A. (2021). Fear of COVID-19, psychological distress, work satisfaction and turnover intention among frontline nurses. *Journal of Nursing Management, 29*(3), 395-403. doi:10.1111/jonm.13168

Lazarus, R. S. (1993). From psychological stress to the emotions: A history of changing outlooks. *Annual review of psychology, 44*(1), 1-22.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*: Springer publishing company.

Lee, T. S., Tzeng, W. C., & Chiang, H. H. (2019). Impact of Coping Strategies on Nurses' Well-Being and Practice. *Journal of Nursing Scholarship, 51*(2), 195-204. doi:10.1111/jnu.12467

Lim, J., Bogossian, F., & Ahern, K. (2010). Stress and coping in Australian nurses: a systematic review. *International nursing review, 57*(1), 22-31.

Lorente, L., Vera, M., & Peiró, T. (2021). Nurses' stressors and psychological distress during the COVID-19 pandemic: The mediating role of coping and

resilience. *Journal of Advanced Nursing*, 77(3), 1335-1344.

doi:10.1111/jan.14695

Middleton, R., Loveday, C., Hobbs, C., Almasi, E., Moxham, L., Lord, H., & Fernandez, R. (2021). The COVID-19 pandemic – A focus on Nurse Managers' mental health, coping behaviours and organisational commitment. *Collegian*, 28(6), 703-708. doi:10.1016/j.colegn.2021.10.006

Monsalve-Reyes, C. S., San Luis-Costas, C., Gómez-Urquiza, J. L., Albendín-García, L., Aguayo, R., & Cañadas-De La Fuente, G. A. (2018). Burnout syndrome and its prevalence in primary care nursing: a systematic review and meta-analysis. *BMC Family Practice*, 19(1). doi:10.1186/s12875-018-0748-z

Selçuk Tosun, A., Akgül Gündoğdu, N., & Taş, F. (2021). Anxiety levels and solution-focused thinking skills of nurses and midwives working in primary care during the COVID-19 pandemic: A descriptive correlational study. *Journal of Nursing Management*, 29(7), 1946-1955. doi:10.1111/jonm.13334

Smith, S., Sim, J., & Halcomb, E. J. (2019). Nurses' Experiences of Working in Rural Hospitals: An integrative review. *Journal of Nursing Management*, 27(3), 482-490. doi:10.1111/jonm.12716

Tabachnick, B. G., & Fidell, L. S. (2014). *Using multivariate statistics* (6th ed.). Essex: Pearson Education Limited.

Tang, K. N., Chan, C. S., Ng, J., & Yip, C.-H. (2016). Action type-based factorial structure of Brief COPE among Hong Kong Chinese. *Journal of Psychopathology and Behavioral Assessment*, 38(4), 631-644.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53-55. doi:10.5116/ijme.4dfb.8dfd

Tokac, U., & Razon, S. (2021). Nursing professionals' mental well-being and workplace impairment during the COVID-19 crisis: A Network analysis. *Journal of Nursing Management*, 29(6), 1653-1659. doi:10.1111/jonm.13285

WHO and UNICEF. (2018). *A vision for primary health care in the 21st century: towards universal health coverage and the Sustainable Development Goals*. Geneva, Switzerland:W. H. Organization.

Williams, B., Brown, T., & Onsman, A. (2012). Exploratory factor analysis: A five-step guide for novices. *Australasian Journal of Paramedicine*, 8(3), 1-13.

World Health Organization. (2020). Role of primary care in the COVID-19 response.

Retrieved from

<https://apps.who.int/iris/bitstream/handle/10665/331921/Primary-care-COVID-19-eng.pdf?sequence=1&isAllowed=y>

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Table 1. Demographics

| | n | % |
|---|-----|-------|
| Employment setting | | |
| General practice | 167 | 46.5 |
| Community nursing services | 97 | 27.0 |
| Other – e.g. aged care, maternal and child health, School/ University | 95 | 26.4 |
| Designation | | |
| Registered Nurses | 320 | 86.1% |
| Other | 39 | 13.9% |
| Primary workplace location | | |
| City / Metropolitan (Urban) | 222 | 61.9 |
| Rural / Remote | 137 | 38.1 |
| Age | | |
| 20-40 years | 74 | 20.6 |
| 41-60 years | 221 | 61.6 |
| >60 years | 63 | 17.5 |
| Missing | 1 | .3 |
| Years employed as a nurse | | |
| ≤20 years | 158 | 43.9 |
| ≥21 years | 200 | 55.7 |
| Missing | 1 | 0.3 |
| Years employed as primary health care nurse | | |
| ≤12 years | 226 | 63.0 |
| ≥13 years | 129 | 35.9 |
| Missing | 4 | 1.1 |

Table 2. Factor Loadings Rotated Component Matrix

| Item No. | Item | Component | | | | | | |
|----------|--|-----------|--------|--------|--------|--------|--------|--------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7 | I've been getting emotional support from others | 0.775 | 0.001 | 0.151 | 0.146 | 0.036 | 0.158 | 0.015 |
| 21 | I've been getting comfort and understanding from someone | 0.772 | 0.01 | 0.169 | 0.135 | 0.071 | 0.107 | 0.197 |
| 22 | I've been getting help and advice from other people | 0.744 | 0.097 | 0.316 | 0.04 | 0.066 | 0.109 | 0.08 |
| 8 | I've been trying to get advice or help from other people about what to do | 0.67 | 0.171 | 0.25 | 0.028 | 0.12 | 0.003 | 0.108 |
| 23 | I've been doing something to think about it less, such as watching movies, TV, reading or sleeping | 0.336 | 0.164 | 0.27 | 0.301 | 0.271 | 0.076 | 0.017 |
| 24 | I've been refusing to believe that it has happened | 0.151 | 0.805 | -0.135 | -0.016 | 0.001 | 0.045 | 0.103 |
| 13 | I've been giving up the attempt to cope | -0.058 | 0.728 | 0.108 | 0.078 | 0.025 | 0.186 | 0.056 |
| 10 | I've been saying to myself "this isn't real" | 0.169 | 0.709 | 0.031 | -0.023 | 0.028 | 0.017 | 0.093 |
| 27 | I've been giving up trying to deal with it | -0.05 | 0.637 | 0.317 | 0.098 | -0.037 | 0.164 | -0.015 |
| 11 | I've been saying things to let my unpleasant feeling escape | 0.502 | 0.527 | 0.025 | 0.129 | 0.213 | -0.019 | -0.006 |
| 28 | I've been blaming myself for things that happened | -0.139 | 0.507 | 0.45 | 0.214 | -0.041 | 0.291 | -0.049 |
| 14 | I've been criticizing myself | 0.121 | 0.497 | 0.448 | 0.19 | 0.02 | 0.176 | -0.154 |
| 25 | I've been expressing my negative feelings | 0.269 | 0.355 | 0.176 | 0.244 | 0.225 | 0.324 | -0.015 |
| 2 | I've been trying to come up with a strategy about what to do | 0.239 | 0.141 | 0.774 | 0.148 | 0.121 | 0.009 | 0.132 |
| 1 | I've been concentrating my efforts on doing something about the situation I'm in | 0.32 | 0.101 | 0.661 | 0.006 | 0.093 | 0.039 | 0.116 |
| 16 | I've been taking action to try to make the situation better | 0.42 | -0.06 | 0.621 | 0.081 | 0.246 | 0.007 | 0.041 |
| 17 | I've been thinking hard about what steps to take | 0.323 | 0.137 | 0.573 | 0.131 | 0.371 | -0.024 | 0.203 |
| 3 | I've been trying to see it in a different light, to make it seem more positive | 0.275 | 0.005 | 0.413 | 0.406 | 0.226 | 0.121 | 0.25 |
| 9 | I've been turning to work or other activities to take my mind off things | 0.254 | 0.269 | 0.38 | -0.025 | 0.304 | 0.092 | -0.217 |
| 19 | I've been making fun of the situation | 0.071 | 0.15 | 0.016 | 0.867 | 0.024 | -0.021 | -0.023 |
| 5 | I've been making jokes about it | 0.143 | 0.073 | 0.139 | 0.859 | 0.152 | 0.04 | 0.015 |
| 18 | I've been looking for something good in what is happening | 0.19 | -0.106 | 0.284 | 0.464 | 0.396 | 0.103 | 0.39 |
| 4 | I've been accepting the reality of the fact that it has happened | 0.068 | 0.009 | 0.096 | 0.093 | 0.824 | 0.004 | 0.075 |
| 15 | I've been learning to live with it | 0.128 | 0.026 | 0.223 | 0.131 | 0.783 | 0.047 | 0.108 |
| 26 | I've been using alcohol or other drugs to help me get through it | 0.121 | 0.157 | 0.031 | 0.018 | 0.026 | 0.936 | -0.017 |
| 12 | I've been using alcohol or other drugs to make myself feel better | 0.165 | 0.249 | 0.056 | 0.017 | 0.033 | 0.892 | 0.004 |
| 20 | I've been praying or meditating | 0.101 | 0.051 | 0.153 | 0.033 | 0.053 | -0.035 | 0.879 |
| 6 | I've been trying to find comfort in my religion or spiritual beliefs | 0.153 | 0.119 | 0.022 | 0.002 | 0.118 | 0.003 | 0.874 |

NOTE: Shading denotes factor loadings

Table 3. Total scores and reliability

| | Number of items | Mean | Std. Deviation | Cronbach's alpha |
|------------------------------|-----------------|-------|----------------|------------------|
| Support | 5 | 9.87 | 3.32 | 0.814 |
| Disengagement and venting | 8 | 28.61 | 3.68 | 0.810 |
| Positive reframing | 6 | 12.84 | 4.31 | 0.834 |
| Humour | 3 | 5.82 | 2.17 | 0.738 |
| Acceptance | 2 | 5.47 | 1.72 | 0.694 |
| Substance use | 2 | 2.79 | 1.38 | 0.923 |
| Religion / Spiritual beliefs | 2 | 3.11 | 1.72 | 0.855 |
| Total score* | 28 | 68.48 | 9.28 | 0.903 |

*Factor 2 has been reverse coded

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Table 4. Association between demographics and the Brief COPE

| | Support | | Disengagement & Venting | | Positive Reframing | | Humour | | Acceptance | | Substance Use | | Religion / Spiritual Beliefs | | Total COPE | |
|---|-----------------|---------|-------------------------|---------|--------------------|---------|----------------|---------|----------------|---------|----------------|---------|------------------------------|---------|-----------------|---------|
| | Mean (SD) | p value | Mean (SD) | p value | Mean (SD) | p value | Mean (SD) | p value | Mean (SD) | p value | Mean (SD) | p value | Mean (SD) | p value | Mean (SD) | p value |
| Age | | | | | | | | | | | | | | | | |
| 20-40 years | 10.60 (3.26) | | 27.35 (4.22) | | 13.58 (4.29) | | 6.09 (2.21) | | 5.28 (1.63) | | 2.74 (1.38) | | 3.00 (1.67) | | 68.63 (8.41) | |
| 41-60 years | 10.09 (3.39) | 0.003* | 28.50 (3.77) | 0.00* | 13.08 (4.28) | 0.02* | 5.94 (2.20) | ND | 5.58 (1.71) | ND | 2.89 (1.39) | ND | 3.10 (1.68) | ND | 69.11 (9.51) | ND |
| >60 years | 8.65 (2.88) | | 29.96 (2.32) | | 11.55 (4.21) | | 5.30 (2.00) | | 5.31 (1.81) | | 2.55 (1.33) | | 3.23 (1.87) | | 66.54 (9.14) | |
| Experience as a primary health care nurse | | | | | | | | | | | | | | | | |
| ≤ 12 years | 10.15 (3.39) | 0.04* | 28.01 (4.03) | 0.00* | 13.26 (4.40) | 0.02* | 5.97 (2.20) | 0.14 | 5.43 (1.66) | 0.60 | 2.83 (1.40) | 0.49 | 3.08 (1.70) | 0.79 | 68.68 (9.34) | 0.56 |
| ≥13 years | 9.37 (3.17) | | 29.57 (2.81) | | 12.13 (4.13) | | 5.60 (2.11) | | 5.53 (1.82) | | 2.73 (1.35) | | 3.14 (1.76) | | 68.06 (9.19) | |
| Experience as a nurse | | | | | | | | | | | | | | | | |
| ≤ 20 years | 10.44 (3.43) | 0.01* | 27.48 (4.34) | 0.00* | 13.65 (4.27) | 0.00* | 6.21 (2.25) | 0.01* | 5.40 (1.69) | 0.52 | 2.85 (1.40) | 0.51 | 3.05 (1.67) | 0.59 | 68.98 (9.65) | 0.42 |
| ≥21 years | 9.47 (3.20) | | 29.40 (2.90) | | 12.26 (4.28) | | 5.56 (2.08) | | 5.53 (1.74) | | 2.75 (1.36) | | 3.16 (1.75) | | 68.13 (9.04) | |
| Location of primary workplace | | | | | | | | | | | | | | | | |
| City/ Metropolitan | 10.26 (3.37) | 0.006* | 28.52 (3.76) | 0.57 | 12.95 (4.26) | 0.564 | 5.83 (2.14) | 0.957 | 5.61 (1.70) | 0.055 | 2.88 (1.39) | 0.119 | 3.04 (1.63) | 0.378 | 69.03 (9.24) | 0.16 |

| | | | | | | | | | | | | | | | | |
|--------------------|-----------------|-----------------|-----------------|----------------|-----------------|----------------|----------------|------------------|----------------|-------|----------------|-------|----------------|-------|-----------------|------|
| Rural/Remote | 9.22 (3.16) | 28.76 (3.56) | 12.66 (4.42) | 5.82 (2.24) | 5.24 (1.74) | 2.64 (1.35) | 3.22 (1.86) | 67.56 (9.31) | | | | | | | | |
| Employment status | | | | | | | | | | | | | | | | |
| Full time | 9.70 (3.62) | 28.71 (3.94) | 12.55 | 5.70 (2.30) | 5.33 (1.78) | 2.71 (1.21) | 3.03 (1.80) | 67.61 (10.29) | | | | | | | | |
| Part time | 10.03 (3.20) | ND | 28.77 (3.44) | ND | 12.95 | ND | 5.91 (2.19) | ND | 5.66 (1.66) | ND | 3.01 (1.61) | 0.04* | 2.98 (1.49) | ND | 69.31 (8.50) | ND |
| Other | 9.85 (3.07) | | 13.10 | 5.85 (1.93) | 5.34 (1.73) | 2.51 (1.03) | 3.10 (1.72) | | | | | | | | | |
| Employment setting | | | | | | | | | | | | | | | | |
| General Practice | 9.68 (3.14) | 28.71 (3.37) | 12.71 (4.01) | 5.59 (2.15) | 5.38 (1.81) | 2.73 (1.25) | 3.04 (1.68) | 67.74 (9.27) | | | | | | | | |
| Other | 10.03 (3.47) | 0.33 | 28.53 (3.93) | 0.67 | 12.95 (4.56) | 0.613 | 6.02 (2.18) | 0.078 | 5.55 (1.64) | 0.372 | 2.84 (1.48) | 0.446 | 3.17 (1.75) | 0.506 | 69.09 (9.27) | 0.19 |

*Significant value