

## Article

# Heading for the Frontline: Mood, Stress, Resilience, and Coping of Nursing Graduates during a Global Pandemic

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**Abstract:** COVID-19 affected health and wellbeing globally. Graduating nursing students face a variety of stressors, and entering the nursing profession during the pandemic adds additional stress. Using a quantitative cross-sectional design, mood, perceived stress, resilience, and coping were assessed in an Australian sample of 112 graduating nursing students, who completed the Brunel Mood Scale (BRUMS), Perceived Stress Scale (PSS-4), and Brief Resilient Coping Scale (BRCS). Mean BRUMS scores for tension, fatigue, and confusion were significantly above population norms and vigour scores were significantly below. Mean PSS-4 scores were reflective of population norms but showed higher levels of stress among younger and on-campus students compared to those who were older or studied externally. BRCS data showed that 82.1% of graduating nursing students were medium- or high-resilient copers. Mood profiles suggested that 19.6% of participants reported moods associated with mental health issues, 23.2% reported moods associated with risk of burnout, and only 17.9% reported mood profiles associated with positive mental health. High mean tension scores reported by graduating nursing students indicated apprehension about joining the profession, although stress, resilience, and coping scores suggested they were adequately managing the additional stressors generated by the global pandemic.

**Keywords:** affect; coping; COVID-19; emotion; feeling; mood; nurse; stress



**Citation:** Terry, V.R.; Parsons-Smith, R.L.; Elliott, J.; Roderick, G.; Luyke, P.; Terry, P.C. Heading for the Frontline: Mood, Stress, Resilience, and Coping of Nursing Graduates during a Global Pandemic. *Sustainability* **2024**, *16*, 1492. <https://doi.org/10.3390/su16041492>

Academic Editors:

Kittisak Jemsittiparsert,  
Husam Rjoub, Ismail Suardi Wekke  
and Parinya Siriattakul

Received: 28 December 2023

Revised: 6 February 2024

Accepted: 7 February 2024

Published: 9 February 2024



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## 1. Introduction

Nurses form the largest body of healthcare professionals in Australia, and while the nursing workforce continues to grow annually, the profession still experiences a chronic shortage of registered nurses [1]. Alarming, survey data from the Australian Primary Health Care Nurses Association (APNA) showed that 86.7% of more than 1000 of its members felt stressed at work, 78.8% felt burnt out, and 28.7% planned to leave their current jobs within the next 2 to 5 years [2], leaving the long-term sustainability of the nursing profession in Australia under threat. Further, a large-scale study of more than 46,000 full-time clinical nurses in Taiwan found that perceived job stress and depressed moods were significant predictors of nurses' intentions to leave the profession [3], indicating that the sustainability challenge extends internationally.

The advent of the COVID-19 pandemic in 2020 exacerbated the stress on nursing professionals and negatively impacted mental health globally, triggering a 25% increase in the prevalence of anxiety and depression worldwide [4]. There is no reason to assume that nursing students, who represent a critical pipeline of new nursing professionals essential for sustaining an adequate workforce, would be immune to such effects. Indeed, an investigation into the effects of the pandemic on the mental wellbeing of 305 final-year

nursing students at three Spanish universities found that the risk of mental health issues had more than doubled from pre-pandemic levels [5]. The authors highlighted the need to prepare students for pandemic situations due to their impact “on the mental health of both the members of the public who will be treated by these future nursing professionals and the students themselves” (p. 694).

Nursing students not only have to cope with the usual stressors associated with university study, such as academic pressure, financial stress, and poor self-care [6], but they typically also experience anxiety about entering the clinical workforce [7]. When additional stressors related to the pandemic, which have been shown to increase the risk of mental ill-health [8], are added to the equation, coping becomes more challenging. It has even been suggested that the pandemic caused some nursing students to feel that they had to choose between pursuing a nursing career and safeguarding the health of their homes and loved ones [9].

Further, a meta-analysis of 27 cross-sectional studies [7] found a high prevalence of depression (34%) among nursing students generally, with younger nursing students (<25 yr.) showing a significantly higher prevalence (41%) than their older counterparts (18%), and Asian nursing students showing the highest prevalence of depression (43%) among geographical groups. Evidence from Portugal related to the transition to professional life of senior nursing students during the pandemic [10] showed that COVID-19 created diverse stressors ranging from “general social risks and fears of the unknown to the more concrete situations related to class interruptions that can postpone the course completion” (p. 5). However, students were equally concerned about non-pandemic issues related to applying their theoretical knowledge in professional practice contexts, particularly in areas such as safe medication administration, communication with multidisciplinary teams, and the fear of making mistakes that could harm patients. Given that nursing students are the nursing professionals of the future, the mental health of graduating nursing students is of particular interest to those concerned about the sustainability of health systems internationally [7].

Mood profiling is a common method for monitoring mental health status in a wide variety of contexts [11–14]. Six distinct mood profile clusters have been reported in the literature, referred to as the iceberg, inverse iceberg, inverse Everest, shark fin, submerged, and surface profiles [13], which are described in detail later in the paper. The prevalence of these profiles among graduating nursing students was explored in the present study. Within medical settings, mood profiling has been used, for example, to monitor the psychological wellbeing of cardiac rehabilitation patients [15] and those recovering from prostate surgery [16]. Among nurses, mood profiling has been used previously to assess the effects of shift work on mood states [17,18]. Collectively, previous findings suggest that the moods of nursing students, particularly scores on the tension and depression subscales, may not only indicate the risk of mental health issues but also flag the risk of poorer clinical care. To assess whether the alarming rates of mental health concerns found among nurses and nursing students in other parts of the world were replicated in Australia, the primary objective of the present study was to assess mood, stress, resilience, and coping among graduating nursing students entering the profession during a global pandemic. A secondary objective was to test whether mood, stress, resilience, and coping scores varied according to the demographic characteristics of the sample. Given that mood scores have previously been shown to vary according to the gender, age, residency status, and study mode of students in the Australian higher education sector during the pandemic [19], the group analyses in the present study included these demographic variables. Finally, employment status among graduating nursing students in Australia has been shown to be a predictor of mental health status [20], and therefore, a comparison of participants who had secured employment and those who had not was included in the analyses.

## 2. Materials and Methods

### 2.1. Study Design and Setting

The present study used a quantitative, cross-sectional design to assess mood, stress, resilience, and coping among nursing students who were eligible to graduate and enter the nursing profession. Recruitment of participants and collection of data occurred at a university in regional Queensland, Australia over a 12-month period from November 2021 to November 2022.

### 2.2. Participants

Purposive sampling was used to recruit nursing students over the age of 18 who had completed all requirements of an undergraduate nursing program and were therefore eligible to graduate and enter the profession as registered nurses. Nursing students in earlier stages of their program and nursing graduates who were already working in the profession were excluded from the study. Nursing students meeting the inclusion criterion, who were identified from program records, were invited to participate via email communications and directed to an online survey (see 2.4 Procedure below for survey details).

### 2.3. Measures

To address our primary objective of assessing mood, stress, resilience, and coping among graduating nursing students, it was necessary to implement appropriate measures of each outcome variable, as described below. The secondary objective of testing whether mood, stress, resilience, and coping scores varied according to the demographic characteristics of the sample was facilitated via collection of information related to gender, age, domestic/international status, on-campus/external study mode, full-time/part-time study status, and employment as a nurse pending graduation.

#### 2.3.1. Assessment of Mood

Mood was assessed using the Brunel Mood Scale (BRUMS) [21], a 24-item scale to assess the six mood dimensions of tension, depression, anger, vigour, fatigue, and confusion (four items each). Respondents rated how they were feeling “right now” (e.g., panicky, miserable, bad-tempered, alert, tired, uncertain) on a 5-point scale from 0 = “not at all” to 4 = “extremely.” Possible scores on each mood dimension ranged from 0 to 16. The measurement model of the BRUMS has been evaluated using multi-sample confirmatory factor analysis, which supported its configural, metric, scalar, and residual invariance [21]. BRUMS scores were interpreted with reference to published tables of normative data [13].

#### 2.3.2. Assessment of Perceived Stress

Perceived stress was assessed using the 4-item version of the Perceived Stress Scale (PSS-4) [22,23]. Respondents rated their feelings and thoughts during the “last month” (e.g., “unable to control the important things in your life”) on a 5-point scale from 0 = “never” to 4 = “very often”. In line with the standard scoring protocol provided for the PSS4 [23], questions 2 and 3 were reverse-scored. Higher scores denoted higher levels of perceived stress, with possible total scores ranging from 0 to 16. Adequate psychometric characteristics have been reported for the PSS-4, including internal consistency ( $\alpha = 0.77$ ). PSS-4 scores were interpreted with reference to the norms produced by Warrtig et al. [23] and descriptive statistics for the original validation study of the PSS-4 [22].

#### 2.3.3. Assessment of Resilience and Coping

Resilience and coping skills were assessed using the 4-item Brief Resilient Coping Scale (BRCS) [24]. Respondents rated their behaviours and actions to questions such as “I believe I can grow in positive ways by dealing with difficult situations” on a 5-point scale ranging from 1 = “does not describe me” to 5 = “describes me very well”. Possible total scores ranged from 4 to 20. Adequate internal consistency, test–retest reliability, and convergent validity have been reported for the BRCS [24]. Total scores ranging

from 4 to 13, 14 to 16, and 17 to 20 were interpreted as low-, medium-, and high-resilient copers, respectively [24].

#### 2.4. Procedure

Data collection occurred via an online survey created using LimeSurvey [25]. The survey captured a range of demographic information (gender, age, domestic/international status, on-campus/external study mode, full-time/part-time study status, and whether they had secured employment as a nurse pending graduation). Also, measures of mood (BRUMS), perceived stress (PSS-4), and resilience and coping (BRCS) were completed. Survey completion time was approximately 10 min. Ethical approval was granted by the Human Research Ethics Committee of the University of Southern Queensland (approval number: H21REA266, date of approval: 2 November, 2021). The study conformed to the “Statement on Human Experimentation” by the National Health and Medical Research Council of Australia [26] and is reported with reference to the “Strengthening the Reporting of Observational studies in Epidemiology (STROBE)” guidelines [27]. All participants provided informed consent by clicking an “I consent” box, having read a detailed online information sheet that included the aims of the project, the voluntary nature of participation, the right to withdraw at any time, a guarantee of anonymity, expected benefits and risks, and how to report any ethical concerns.

#### 2.5. Data Analysis

The IBM Statistical Package for the Social Sciences (SPSS) program, version 28.0 [28], was used for all analyses. Descriptive statistics were calculated for all dependent variables, and score distributions were checked for non-normality. To interpret the mean group mood of the nursing students, BRUMS scores were compared: (a) to population normative scores for the measure, derived from 15,692 participants [13], and (b) to mean BRUMS scores collected among a general population sample of 1062 participants at the height of the COVID-19 pandemic [8]. Multivariate analysis of variance (MANOVA) was used to compare BRUMS, PSS-4, and BRCS scores among participants grouped by demographic characteristics, where group sizes were viable. Group comparisons were made for age ( $\leq 30$  years vs. 31+ years), residency (international vs. domestic students), mode of study (on-campus vs. external; full-time vs. part-time), and employment status (employment secured vs. employment not secured). Effect sizes were assessed using Cohen’s  $d$  [29], where 0.20, 0.50, and 0.80 represent small, moderate, and large effects, respectively. No group comparison was conducted for gender due to the very large proportion of participants (87.5%) who identified as female. Pearson correlation analysis was used to identify relationships among measured variables, and seeded k-means cluster analysis was used to classify participants into mood clusters. The prevalence of each mood cluster was compared to previous findings [8,13,19] to determine the percentage of participants who reported mood profiles associated with positive mental health or risk of mental health issues. A power analysis indicated that, given the number of groups and response variables, a minimum sample size of 51 would be required to detect a predicted effect size of 0.20 at  $p < 0.05$  with 80% power [30].

### 3. Results

#### 3.1. Participant Characteristics

A total of 112 graduating nursing students completed the survey (female = 98, 87.5%; male = 14, 12.5%), ranging in age from 20 to 69 years ( $M = 33.3$  years,  $SD = 11.4$  years, median = 30 years). A total of 88 were domestic students (78.6%) and 24 were international students (21.4%); 56 studied on-campus (50%) and 56 studied externally (50%); 81 studied full-time (72.3%) and 31 studied part-time (27.7%). Fifty-one participants (45.5%) had already secured employment as a nurse pending their graduation, whereas 61 (54.5%) had yet to find employment.

### 3.2. Reliability of Measures

For the BRUMS, internal consistency coefficients of the six subscales in the present study ranged from 0.80 to 0.86, exceeding the 0.70 benchmark of acceptability [31]. To aid in the interpretation of mood scores, raw scores were transformed into standard T-scores using tables of normative scores for the BRUMS [13]. For the PSS-4 and BRCS, the internal consistency coefficients in the present study ( $\alpha = 0.60$  and  $\alpha = 0.56$ , respectively) fell below the 0.70 benchmark of acceptability [31], suggesting that results for these measures should be interpreted with caution.

### 3.3. Data Screening and Descriptive Statistics

Data were screened for missing or out-of-range values and non-normal distributions. No missing values were detected, and all responses were within the range of possible values. Descriptive statistics are shown in Table 1. Except for BRUMS anger scores, and to a lesser extent, depression and confusion scores, which were positively skewed and leptokurtic, no univariate non-normality was evident [30]. The non-normality observed for anger, depression, and confusion scores was due to a small number of participants scoring towards the upper end of the 0–16 scale. Such participants are of particular interest when screening for mental health issues, and therefore, they were retained in the dataset. The Mahalanobis distances statistic was calculated to identify multivariate outliers at  $p < 0.001$  [32], but none were found. Therefore, all cases were retained and 112 participants were included in the analyses.

**Table 1.** Descriptive statistics for PSS-4, BRCS, and BRUMS scores for 112 graduating nurses.

| Source    | <i>M</i> | <i>SD</i> | Minimum | Maximum | Skewness | Kurtosis |
|-----------|----------|-----------|---------|---------|----------|----------|
| PSS-4     | 6.17     | 2.06      | 1       | 12      | 0.22     | 0.31     |
| BRCS      | 15.24    | 2.21      | 9       | 20      | −0.29    | 0.34     |
| BRUMS-Ten | 6.07     | 4.39      | 0       | 16      | 0.64     | −0.43    |
| BRUMS-Dep | 2.52     | 3.34      | 0       | 14      | 1.59     | 2.07     |
| BRUMS-Ang | 2.05     | 3.00      | 0       | 14      | 2.19     | 5.35     |
| BRUMS-Vig | 8.09     | 3.65      | 0       | 16      | 0.16     | −0.48    |
| BRUMS-Fat | 6.99     | 4.47      | 0       | 16      | 0.39     | −0.84    |
| BRUMS-Con | 3.51     | 3.44      | 0       | 15      | 1.20     | 0.86     |

Note. Ten = tension, Dep = depression, Ang = anger, Vig = vigour, Fat = fatigue, Con = confusion.

### 3.4. Mood Scores

#### 3.4.1. Comparison with Population Norms

As explained above, raw mood scores were transformed into standardized T-scores, which, by definition, have a mean of 50 and a standard deviation of 10, and were then compared with test norms [13]. Significant deviations from test norms were found for tension, vigour, fatigue, and confusion scores, with effect sizes ranging from medium-to-large for tension ( $d = 0.70$ ) and small-to-medium for the remaining three subscales ( $d = 0.22$ – $0.38$ ; Table 2). Subscale means are compared graphically to test norms in Figure 1, which also includes a comparison with mean BRUMS scores derived from the general population during the pandemic [8].

**Table 2.** Mean BRUMS scores for 112 graduating nurses vs. population norms.

| Subscale   | <i>M</i> | <i>SD</i> | 95% CI         | <i>t</i>          | <i>g</i> |
|------------|----------|-----------|----------------|-------------------|----------|
| Tension    | 59.21    | 13.16     | [56.75, 61.68] | 7.41 <sup>†</sup> | 0.70     |
| Depression | 51.11    | 10.69     | [49.11, 53.11] | 1.10              | -        |
| Anger      | 49.54    | 9.64      | [47.73, 51.34] | −0.51             | -        |
| Vigour     | 52.06    | 9.17      | [50.35, 53.78] | 2.38 <sup>*</sup> | 0.22     |
| Fatigue    | 54.34    | 11.34     | [52.22, 56.46] | 4.05 <sup>†</sup> | 0.38     |
| Confusion  | 53.19    | 11.06     | [51.12, 55.26] | 3.05 <sup>§</sup> | 0.29     |

Note. All scores are T-scores; *t* = 2-tailed *t*-test between observed mean and normative mean of 50 (*SD* = 10); *g* = effect size; <sup>\*</sup>  $p < 0.05$ , <sup>§</sup>  $p < 0.01$ , <sup>†</sup>  $p < 0.001$ .

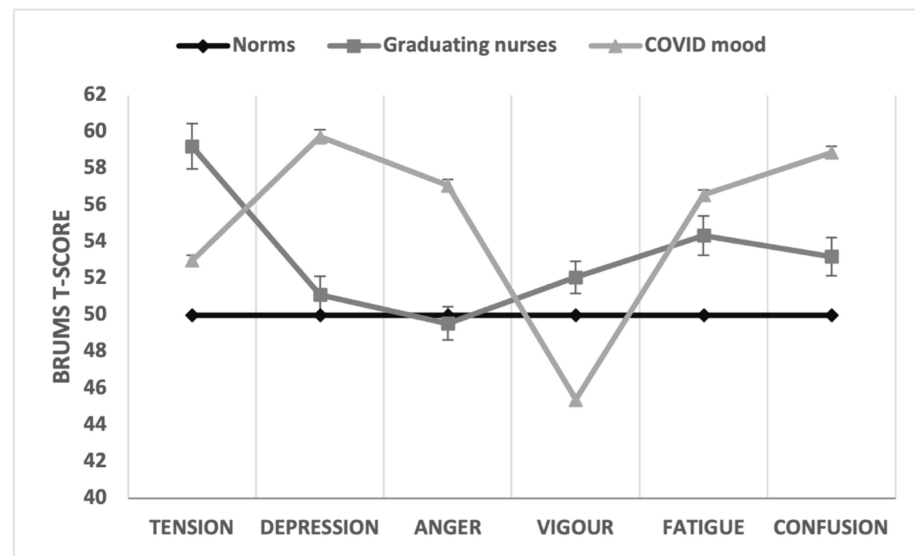


Figure 1. Comparison of mean mood for 112 graduating nurses, compared to test norms [13] and mood during COVID-19 lockdowns [8].

### 3.4.2. Between-Group Comparisons of Mood

Between-group comparisons of mood scores are shown in Table 3. A significant between-group difference was found for residency status (Wilks’ $\Lambda = 0.765, F(6, 105) = 5.368, p < 0.001, \text{partial } \eta^2 = 0.235$ ), explaining 23.5% of the variance. Univariate tests showed that international students reported higher vigour scores ( $M = 59.21, SD = 9.26$ ) than domestic students ( $M = 50.11, SD = 8.17; p < 0.001, d = 0.99$ ).

Table 3. Between-group comparisons of mood, perceived stress, resilience, and coping scores among 112 nursing students.

| Variable Group | n  | Tension |       | Depression |       | Anger |       | Vigour       |             | Fatigue |       | Confusion |       | PSS-4       |             | BRCS  |      |
|----------------|----|---------|-------|------------|-------|-------|-------|--------------|-------------|---------|-------|-----------|-------|-------------|-------------|-------|------|
|                |    | M       | SD    | M          | SD    | M     | SD    | M            | SD          | M       | SD    | M         | SD    | M           | SD          |       |      |
| Residency      |    |         |       |            |       |       |       |              |             |         |       |           |       |             |             |       |      |
| Domestic       | 88 | 58.49   | 12.62 | 50.24      | 10.08 | 48.97 | 8.65  | <b>50.11</b> | <b>8.17</b> | 55.19   | 11.34 | 52.41     | 10.52 | 6.14        | 2.23        | 15.03 | 2.08 |
| International  | 24 | 61.88   | 14.95 | 54.29      | 12.38 | 51.63 | 12.65 | <b>59.21</b> | <b>9.26</b> | 51.21   | 11.00 | 56.04     | 12.65 | 6.29        | 1.27        | 16.00 | 2.54 |
| Employment     |    |         |       |            |       |       |       |              |             |         |       |           |       |             |             |       |      |
| Yes            | 51 | 59.12   | 13.25 | 48.90      | 9.66  | 49.63 | 9.98  | <b>49.43</b> | <b>8.64</b> | 56.18   | 10.16 | 51.86     | 10.28 | 5.82        | 2.10        | 15.47 | 1.90 |
| No             | 61 | 59.30   | 13.19 | 52.95      | 11.23 | 49.46 | 9.43  | <b>54.26</b> | <b>9.09</b> | 52.80   | 12.10 | 54.30     | 11.63 | 6.46        | 2.00        | 15.05 | 2.43 |
| Location       |    |         |       |            |       |       |       |              |             |         |       |           |       |             |             |       |      |
| On-Campus      | 56 | 60.55   | 13.57 | 53.36      | 11.85 | 50.12 | 10.95 | 54.02        | 9.47        | 54.14   | 11.38 | 54.30     | 12.11 | <b>6.57</b> | <b>1.84</b> | 15.20 | 2.41 |
| External       | 56 | 57.88   | 12.71 | 48.86      | 8.93  | 48.95 | 8.18  | 50.11        | 8.51        | 54.54   | 11.40 | 52.07     | 9.88  | <b>5.77</b> | <b>2.20</b> | 15.29 | 2.01 |
| Mode           |    |         |       |            |       |       |       |              |             |         |       |           |       |             |             |       |      |
| Full-time      | 81 | 59.59   | 13.07 | 51.52      | 10.82 | 49.78 | 10.38 | 52.00        | 9.48        | 54.72   | 11.55 | 53.84     | 11.81 | 6.19        | 2.00        | 15.31 | 2.31 |
| Part-time      | 31 | 58.23   | 13.55 | 50.03      | 10.42 | 48.90 | 7.49  | 52.23        | 8.47        | 53.35   | 10.88 | 51.48     | 8.74  | 6.13        | 2.23        | 15.06 | 1.93 |
| Age Group      |    |         |       |            |       |       |       |              |             |         |       |           |       |             |             |       |      |
| ≤30 years      | 56 | 60.88   | 13.55 | 51.38      | 9.85  | 49.04 | 9.57  | 53.63        | 9.23        | 54.98   | 11.39 | 53.73     | 11.56 | <b>6.77</b> | <b>1.94</b> | 15.27 | 2.26 |
| 31+ years      | 56 | 57.55   | 12.66 | 50.84      | 11.55 | 50.04 | 9.77  | 50.50        | 8.92        | 53.70   | 11.35 | 52.64     | 10.60 | <b>5.57</b> | <b>2.02</b> | 15.21 | 2.17 |

Note. Significant group differences are shown in bold typeface.

A comparison between graduating nursing students who had secured employment and those who had not showed a significant multivariate effect (Wilks’ $\Lambda = 0.802, F(6, 105) = 4.330, p < 0.001, \text{partial } \eta^2 = 0.198$ ), explaining 19.8% of the variance. Univariate tests showed that students who had not yet secured employment reported higher vigour scores ( $M = 54.26, SD = 9.09$ ) than domestic students ( $M = 49.43, SD = 8.64; p = 0.005, d = 0.53$ ).

A significant result ( $p = 0.04$ ) was also identified for study location (on-campus vs. external), although none of the univariate analyses reached significance once a Bonferroni adjusted alpha value of  $p < 0.008$  was applied to account for the six dependent variables. No significant differences in mood scores were found for age ( $\leq 30$  years vs. 31+ years) or mode of study (full-time vs. part-time).

### 3.5. Perceived Stress

PSS-4 scores for the group overall ( $M = 6.17$ ,  $SD = 2.06$ ) were lower than female norms in a UK sample ( $M = 6.38$ ,  $SD = 3.15$ ) [23], although the difference was not significant [Welch  $t(175) = 0.96$ ,  $p = 0.339$ ]. Compared to the scores for females ( $M = 4.7$ ,  $SD = 3.1$ ) reported in the original validation study of the PSS-4 by Cohen et al. [22], the graduating nurses in the present study reported significantly higher perceived stress [Welch  $t(144) = 7.07$ ,  $p < 0.001$ ].

As shown in Table 3, significant between-group differences were found in PSS-4 scores for study location [ $t(111) = -2.098$ ,  $p = 0.038$ ,  $d = 0.40$ ], in that on-campus students ( $M = 6.57$ ,  $SD = 1.84$ ) reported higher perceived stress than those who studied externally ( $M = 5.77$ ,  $SD = 2.20$ ), and for age group [ $t(111) = 3.203$ ,  $p = 0.002$ ,  $d = 0.61$ ], wherein students up to and including the age of 30 years ( $M = 6.77$ ,  $SD = 1.94$ ) reported higher perceived stress than students aged 31 years and older ( $M = 5.77$ ,  $SD = 2.02$ ).

No significant differences for perceived stress were found for gender, residency status, mode of study, or employment status.

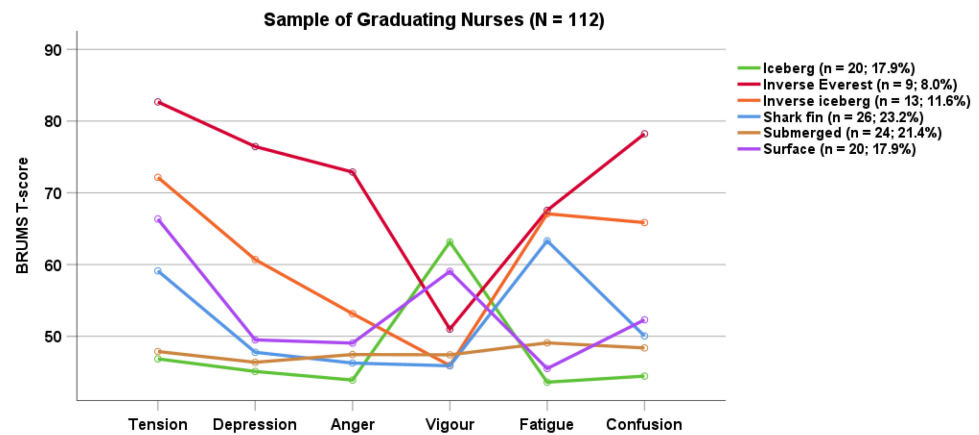
Pearson correlations showed positive relationships between scores for PSS-4 and BRUMS tension [ $r(111) = 0.185$ ,  $p = 0.05$ ]; depression [ $r(111) = 0.248$ ,  $p = 0.008$ ]; fatigue [ $r(111) = 0.260$ ,  $p = 0.006$ ]; and confusion [ $r(111) = 0.195$ ,  $p = 0.039$ ], and an inverse relationship between scores for PSS-4 and vigour [ $r(111) = -0.225$ ,  $p = 0.017$ ].

### 3.6. Resilience and Coping

Using the Brief Resilient Coping Scale (BRCS) classification cut-offs [24], 17.9% of nursing graduates were classified as low-resilient copers ( $M = 11.85$ ,  $SD = 1.27$ ), 56.3% as medium-resilient copers ( $M = 15.10$ ,  $SD = 0.84$ ), and 25.9% as high-resilient copers ( $M = 17.90$ ,  $SD = 1.05$ ). As shown in Table 3, no significant differences for resilience and coping were found for residency status, employment status, mode of study, study location, or age group. A positive correlation was found between BRCS scores and BRUMS vigour scores [ $r(112) = 0.210$ ,  $p = 0.026$ ]. No other significant relationships between mood and resilience were found.

### 3.7. Cluster Analysis of Mood Scores

A seeded k-means cluster analysis was used to classify participants into distinct mood clusters to identify participants who reported mood profiles shown previously to be associated with an increased risk of mental health issues. Cluster analysis identified the six distinct mood profiles found in the literature, referred to as the iceberg, inverse Everest, inverse iceberg, shark fin, submerged, and surface profiles, with similar but not identical prevalence rates to those previously reported (Figure 2) [8,13,19,33]. The prevalence of the inverse Everest profile in the present study (8%) was higher than reported among a large sample ( $N = 15,692$ ) of the general population (4.6%) [33], but lower than samples of the general population (12.2%) [8] and students (9.5%) [19] during the pandemic. The prevalence of the inverse iceberg profile in the present sample (11.6%) is almost identical to population norms (11.8%) [13] and lower than COVID-specific samples (13%) [19], (21.2%) [8]. A further 26 nursing graduates (23.2%) reported a shark fin mood profile, characterised primarily by very high levels of fatigue and low levels of vigour, which has been linked to poor adherence to safety procedures [34] and may therefore pose a risk to patient safety. This prevalence is much higher than population norms (15.5%) [13] and other groups assessed during the COVID-19 pandemic (15.6%) [19], (12.9%) [8]. The prevalence of the iceberg profile in the present study (17.9%) was much lower than reported in the general population (28.5%) [13] and lower than among other samples tested during the COVID-19 pandemic (20.2%) [8], (20.3%) [19].



**Figure 2.** Graphical representation of the 6-cluster solution for 112 graduating nurses.

#### 4. Discussion

Concern for the sustainability of the health system in Australia prompted this quantitative, cross-sectional study of final year nursing students. The primary aim of the study was to assess mood, stress, resilience, and coping among graduating students entering the nursing profession during a global pandemic. A secondary aim was to test whether mood, stress, resilience, and coping scores varied according to the demographic characteristics of the sample.

The average mood of the graduating nursing students was more negative than population norms, with tension, fatigue, and confusion scores all significantly elevated [13]. It should be noted, however, that the average mood of the graduating nursing students was more positive than the typical mood reported among the general population during the height of the pandemic, using the same assessment methods [8]. The most notable characteristic of the group mood profile was the significantly elevated levels of tension compared to population norms, which represented a moderate-to-large effect. Although the overall negativity of mood was relatively modest, about one fifth of nursing graduates reported mood profiles (i.e., inverse Everest and inverse iceberg) associated with an elevated risk of mental health issues [11–14]. The inverse Everest profile, which is characterised by very high scores for tension, depression, anger, fatigue, and confusion, is clearly not reflective of positive mental health, nor is it an optimal mood for graduating nursing students to enter the profession.

The inverse iceberg profile, which is characterised by high scores for tension, depression, anger, fatigue, and confusion, and low scores for vigour, has been used for decades as a signal of potential burnout among athletes [12,35]. It is also indicative of the risk of mental health issues in military [14] and youth groups [11]. The prevalence of the inverse iceberg profile in the present sample was almost identical to population norms [13], and lower than COVID-specific samples [8,19]. Nearly a quarter of nursing students reported a shark fin mood profile, characterised primarily by very high levels of fatigue and low levels of vigour. This prevalence is much higher than population norms [13] and other groups assessed during the COVID-19 pandemic [8,19]. The behavioural consequences of a shark fin mood profile are not well-understood, although it has been linked to poor adherence to safety procedures in high-risk vocations [34]. As such, nurses who report high levels of fatigue may pose a risk of making medication errors, which represents a critical threat to patient safety. Fatigue among nurses has frequently been implicated as a cause of medication errors in health facilities [36–39]. A striking feature of the mood profiles was the low prevalence among the graduating nursing students of the iceberg profile, which has been associated with positive mental health and superior performance for several decades [40,41]. The prevalence of the iceberg profile in the present study was much lower than reported in the general population [13,33] and among other samples assessed during the COVID-19 pandemic [8,19].



A relatively small number of between-group differences in mood scores were found. These were restricted to higher levels of vigour reported by international students compared to domestic students, and by those still seeking employment compared to those who had already secured a job post-graduation. Previous research [19] has shown more extensive differences in mood scores by residency status, with international students reporting higher tension, depression, anger, and confusion, as well as vigour, compared to domestic students. The greater consistency of mood scores within the current sample may be explained by the fact that the participants were all nursing students, whereas previous research [19] surveyed students across a very wide range of academic disciplines. Regarding employment status, it has been shown that being employed significantly reduces the risk of mental ill-health among pre-registration nursing students [20]. It is perhaps surprising that graduating nursing students in the present study who had not yet secured employment did not report higher scores on negative mood dimensions, nor on stress scores, compared to those who already had a job to start after graduating.

Results for perceived stress showed that the cohort of graduating nursing students in the present study reported PSS-4 scores that were high compared to the mean scores reported in the original validation study [22] but comparable with population norms for the measure derived from a UK sample [23]. On-campus students reported higher perceived stress than those who studied externally. This finding is consistent with a previous study of Australian students [19], which found that on-campus students reported higher scores for depression, anger, and confusion, which was explained by “the greater flexibility afforded by online study may alleviate rather than exacerbate the stressors involved” [19] (p. 11). The difference in perceived stress according to age group is consistent with the findings of a study on generational differences in psychological wellbeing among a sample of 631 Australian pre-registration nursing students [42], which reported higher anxiety scores among the younger nurses compared to their older counterparts. Other studies on age differences in psychological wellbeing beyond the realm of nursing have shown older adults to have more highly developed skills for managing stress and use more adaptive stress management strategies [43].

Regarding resilience and coping, a large majority of the graduating nursing students in the present study reported BRCS scores that placed them in the categories of medium- or high-resilient copers. This finding mirrors the results of a systematic review of research on resilience and coping among healthcare workers during the COVID-19 pandemic [44], in which most studies showed healthcare workers to have high or moderate levels of psychological resilience. With respect to coping, most studies have shown high scores for positive (adaptive) rather than negative (maladaptive) coping among healthcare workers [44]. Overall, findings from the present investigation suggest that most graduating students entering the nursing profession during the pandemic do not feel overly stressed, as assessed by the PSS-4, and tend to report positive appraisals of their psychological resilience and ability to cope with the demands of the pandemic, as assessed by the BRCS. These results are encouraging for those seeking to maintain a sustainable pipeline of new graduates into the nursing profession. Nevertheless, focus should be maintained on promoting strategies to support those coming into the profession and to encourage more experienced nurses to remain in the profession.

#### 4.1. Future Research

There is a need for future research to address the projected shortfall of nurses domestically [1,45] and globally [3]. Bakker and colleagues [46] conducted a systematic review of 21 studies that evaluated interventions designed to improve the mental health of students and novice nurses and/or prevent nurses from leaving the profession. Interventions were focused on managing stress, facilitating the transition to nursing practice, or a combination of both. Only five studies showed a significant effect on dropout-related outcomes, and generally, study quality was judged to be low with a high overall risk of bias. The authors concluded that, although a wide range of interventions are available, compelling evidence

of their effectiveness is limited. Therefore, for the long-term sustainability of the nursing workforce in Australia and internationally, future research should seek to develop effective ways to support nurses in training and once they are working in the profession, to prevent dropout rates.

To address this need, a systematic review of factors influencing retention among undergraduate nursing students in regional, rural, and remote areas of Australia was conducted by Liu and colleagues [47], the findings of which emphasized the importance of academic and personal support and highlighted several internal factors (such as stress, personal qualities, ability to engage with classes and institutions, time management, lack of confidence, cultural well-being, and Indigenous identity) and external factors (such as technical difficulties, casual tutors, different competing demands, study facilities, and financial and logistical barriers), all of which were shown to influence retention. Further research to develop evidence-based strategies to address these issues is urgently required.

A study by Grundy and Lum [48] reported that patient expectations evolved during the pandemic, with the traditional expectations of safe, reliable, and compassionate care being augmented by an additional expectation of specific COVID-19-related safety procedures. The Universities Australia organisation has predicted a national shortfall of 85,000 nurses by 2025 [45], requiring a significant expansion of clinical placements for nursing students, especially in the growth areas of aged care, primary care, mental health care, and disability services. Given the likely outbreaks of future pandemics, it would be prudent for student nurses to receive clinical training in pandemic-specific care as part of their university training. University academics should consider this recommendation when designing future iterations of nursing program curricula.

#### 4.2. Strengths and Limitations

It is a strength of the present study that participation was restricted to students who were about to graduate from a nursing degree program and enter the workforce, as this cohort becomes the much-needed new recruits into the nursing profession. Limitations of the present study are acknowledged. Firstly, data were collected at one university among students who participated voluntarily. Therefore, results may not generalise to graduating nursing students in other parts of Australia and beyond. Secondly, given that some of the measures used in the present study (PSS-4, BRCS) had reliability coefficients below the standard benchmark of acceptability, results related to those measures should be viewed with caution. Thirdly, no safeguards were implemented to prevent multiple completions of the survey by the same participant, although a check of the demographic details in the final dataset confirmed that no multiple completions had occurred.

#### 5. Conclusions

It is concluded that nursing students eligible to graduate from a university program and enter the nursing profession during a pandemic reported a range of mood profiles. More than 40% of graduating nursing students reported moods previously shown to be associated with elevated mental health risk or potential risk of burnout, and fewer than 20% reported mood profiles associated with positive mental health. Regarding perceived stress, resilience, and coping, participants generally reported normal levels of stress (compared to UK norms), and more than 80% of graduating nursing students were classified as medium- or high-resilient copers. Group differences across the measured variables were limited. Given that graduating nursing students become frontline health professionals, it is important that their mental health is sufficiently robust to provide optimal care for patients. Therefore, it is recommended that organisations responsible for the training of nurses consider the implementation of initiatives designed to promote positive mental health.

**Author Contributions:** V.R.T.: Conceptualization, data curation, investigation, methodology, supervision, writing—original draft, review and editing. R.L.P.-S.: Data curation, formal analysis, methodology, visualization, writing—original draft, review and editing. J.E.: Methodology, writing—

original draft, review and editing. G.R.: Methodology, writing—original draft, review and editing. P.L.: Methodology, writing—original draft, review and editing. P.C.T.: Conceptualization, formal analysis, methodology, supervision, visualization, writing—original draft, review and editing. All authors have read and agreed to the published version of the manuscript.

**Funding:** No funding sources were used in writing this manuscript.

**Institutional Review Board Statement:** This study was reviewed and approved by the Human Research Ethics Committee (HREC) of the University of Southern Queensland (approval number: H21REA266, date of approval: 2 November 2021).

**Informed Consent Statement:** All participants provided written informed consent.

**Data Availability Statement:** Data are available from the corresponding author upon request.

**Conflicts of Interest:** The authors declare no conflict of interest.

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