Research article

Stress, mental health, and protective factors in nursing students: An observational study

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ABSTRACT

Background: Nursing students suffer high levels of stress, especially in the first year.
Objectives: to compare academic stress at the beginning and end of nursing studies; to analyse the relationships between academic stress, mental health, and protective factors; and to examine whether resilience mitigates the effect of academic stress on psychological well-being.
Design: A cross-sectional study.
Setting and participants: Sample was 370 first- and fourth-year nursing students from Spain (University of Castilla-La Mancha, University of Cantabria, and University of Sevilla).
Variables and data collection: We assessed academic and clinical stress, coping skills, anxiety, depression, psychological well-being, and resilience were measured.
Data analysis: We performed a descriptive analysis of the study sample, as well as correlation and hierarchical regression models. Additionally, mediation models were estimated.
Results: First-year students presented higher academic stress than fourth-year students. Clinical stress, anxiety, depression, and emotional coping predicted academic stress, while academic stress, depression, and coping skills predicted psychological well-being. Mediation models showed a significant path between academic stress, resilience, depression, and psychological well-being.
Conclusion: Academic stress has a detrimental effect on the mental health. Coping strategies and resilience may be protective factors that should be encouraged in interventions designed to improve psychological well-being.

1. Introduction

In recent years, the stress pandemic has emerged as one of the major problems of our society, including among young adult college students (Hoyt et al., 2021). Prevalence studies have found that 34.5 % of Spanish college students suffer from stress (Ramón-Arbués et al., 2020) with 43.8 % of a sample of nursing students reporting high levels of stress during the last month (Kupcewicz et al., 2020). Moreover, before the COVID-19 pandemic, global stress levels in college students had increased (Fang et al., 2022), being higher in nursing students (Black Thomas, 2022). Additionally, a recent study shows that between 49.5 and 52.8 % of Spanish college students reported moderate to severe anxiety and low levels of psychological well-being (Ministerio de Universidades, 2023).

Recent studies have identified several factors as influencing academic distress in college students, such as the social environment, economic difficulties, family support, the competitive environment, level of difficulty of exams, or difficulties in balancing studies and leisure time

(Ministerio de Universidades, 2023). Furthermore, these stressors may vary depending on the year of study. First-year students starting university education face stressful situations, such as adapting to a new academic and social environment, leaving the family home, managing higher academic demands, and developing independent living skills (Kural and Özyurt, 2023; Willoughby et al., 2020). Although these stressors can be present throughout the entire university period, they seem to have a more significant impact on first-year students, as the changes tend to be greater during the process of transition to university than in subsequent years (Kural and Özyurt, 2023). Meanwhile, final-year students face stressors related to completing their studies and coping with the working environment (Lavoie-Tremblay et al., 2022).

With respect to nursing students, they are considered a high stress group due to their practice-based educational programme and the combination of academic and clinical training (Bhurtun et al., 2019; Ching et al., 2020). Two main sources of stress have been identified: academic and clinical (Labrague et al., 2018; Pulido-Martos et al., 2012). Specifically, academic stressors refer to factors related to assignments and workload, exams, pressure of grades, relations with academic staff, fear of failing and meeting deadlines (Pulido-Martos et al., 2012). Nursing studies have recently increased their theoretical and practical content, becoming challenging and innovative programmes, increasing, in turn, the workload for the student (He et al., 2018; Turner and McCarthy, 2017). Due to the initial year being more theoretical, academic stress may be higher in first-year students (Lavoie-Tremblay et al., 2022; Salvarani et al., 2020). However, another study found higher levels of stress in experienced nurse students (Jimenez et al., 2010). Thus, there is no conclusive evidence across studies on whether stress is higher in first-year or final-year nursing students (Lavoie-Tremblay et al., 2022; Onieva et al., 2020).

On the other hand, clinical stress is related to situations such as patient suffering or death, lack of professional knowledge and skills, handling clinical emergencies and relations with clinical staff. In this line, in Spanish curricula, clinical practice starts in the second year and continues until the end of the course. Thus, the expectations that first year students may develop regarding their future competences and the unfamiliarity of the environment could be considered as stressors that tend to be mitigated in more experienced students (D'emeh and Yacoub, 2021; Labrague et al., 2017). Stress during nursing training is also compounded by role transition, role demand, and ambiguity (Shiferaw et al., 2015).

For these reasons, the educational and scientific community is making efforts to identify domains relevant to stress management to enhance interventions for students' well-being. In this line, resilience is a well-known protective factor that minimizes the negative impact of nursing students stress (Diffley and Duddle, 2022). Thus, resilience is an affective-motivational variable through which nursing students acquire personal competencies to cope with adversity (Li and Hasson, 2020; Kim et al., 2023). Previous studies have shown that resilience mitigates the effect of stress on learning in nursing students and mediates the association between academic stress and quality of life (Berdida and Grande, 2023). However, to date, no studies have delved into the protective effect of resilience against stress on psychological well-being in nursing students and its associations with mental health. Another protective factor is that of coping skills, which refer to the skills required to manage situations of stress, helping students improve their academic performance. According to Lazarus and Folkman (Lazarus and Folkman, 1984) there are two main coping strategies: problem-focused coping, known as active coping, which entails solving problems, analysing the situation logically or seeking advice; and emotion-focused coping, known as avoidant or passive coping, which involves withdrawing from the situation or engaging in wishful thinking. While problem-focused strategies have been associated with adaptive performance, emotion-focused coping has been associated with low self-esteem and depressive symptoms (Cong et al., 2021). Thus, emotion-based coping strategies would be less recommended and less widely used in nursing settings (Labrague

et al., 2017; Wang et al., 2019).

Therefore, more research is needed on stress in nursing students and its associations with psychological health and protective factors. Due to the fact that first-year students have the highest academic workflow and no clinical practices, and the fourth-year students have the highest number of clinical practices and have developed coping strategies, the impact that clinical and/or academic stressors have on students is expected that differs (Kural and Özyurt, 2023; Willoughby et al., 2020; Lavoie-Tremblay et al., 2022). So that, the objectives of this study were to compare academic stress at the beginning and end of nursing studies in a sample of first- and fourth-year students; to analyse the relationships between academic stress, and mental health (anxiety, depression, and psychological well-being) and protective factors (coping strategies and resilience); and to determine whether resilience mitigates the effect of academic stress on psychological well-being.

2. Methods

2.1. Study design

The design of the study was a cross-sectional study.

2.2. Study criteria

The participants in the study formed a convenience sample recruited from three Spanish public universities ($N = 370$). The inclusion criteria were: 1) being enrolled in the first or fourth year of a nursing degree; 2) giving consent to voluntary participation after being informed of the purpose of the study; and 3) having no physical/sensory difficulties that would prevent participants from answering the questionnaires. No participants were eliminated from the study under these criteria.

2.3. Measures

2.3.1. Academic and clinical stress

Academic and clinical stress were measured with the Stressors in Nursing Students Scale (SINS) (Watson et al., 2018; Sarabia et al., 2020). The scale consists of a 43-item instrument with 5 Likert-type response options, from $1 = not\ stressful$ to $5 = very\ stressful$, with questions on a range of stressors that nursing students are liable to encounter. Higher total scores represent sources that are more stressful (range: 1–45). The psychometric properties of the Spanish version of the SINS were adequate (academic factor: $\alpha = 0.83$; and clinical factor: $\alpha = 0.91$).

Because first-year nursing students do not perform clinical practice, they were asked to respond to the clinical stress factor according to their previous expectations/beliefs about the stressors.

2.3.2. Coping skills

Coping strategies were assessed using the Coping Strategies Questionnaire (*Cuestionario de Afrontamiento del Estrés* [CAE]) (Sandín and Chorot, 2003); a 42-item self-report measure that assesses two basic categories: problem-focused strategies and emotion-focused strategies, with 5 Likert-type response options, from $0 = never$ to $4 = almost\ always$, based on the question "*How do you usually behave in stressful situations?*". The range for problem-focused strategies is 0–72 and the range for emotion-focused strategies is 1–48. CAE showed adequate reliability indices ($\alpha = 0.79$).

2.3.3. Depression and anxiety

Depressive and anxiety symptomatology were assessed with items from the item banks of the Patient-Reported Outcomes Measurement Information System (PROMIS) (Cella et al., 2010). We used two self-report measures including four items assessing depressive symptoms and four items assessing anxiety symptomatology in the last seven days, with questions rated from 0 (*never*) to 4 (*almost always*). Higher scores represent higher levels of symptomatology (depressive and anxiety

symptoms range: 1–20). Reliability indices for the two PROMIS scales were excellent (α = 0.96).

2.3.4. Resilience

Resilience was measured with the 10-item Connor–Davidson Resilience Scale (Campbell-Sills and Stein, 2007; Notario et al., 2011). The CD-RISC is a self-administered questionnaire answered on a Likert-type scale with five responses (0 = *never*; 4 = *almost always*). The final score on the questionnaire was the sum of the responses obtained on each item (range: 0–40) and the highest scores indicated the highest level of resilience. The Spanish version of the CD-RISC has a Cronbach's alpha of 0.85.

2.3.5. Psychological well-being

To assess psychological well-being, the Spanish version of the Ryff Scales of Psychological Well-Being were used (Díaz et al., 2006). This is a 29-item multidimensional measure with 6 Likert-type response options, from 1 = *strongly disagree* to 6 = *strongly agree*. Higher scores correspond to higher levels of psychological well-being (range: 1–174). The Spanish version of this scale has a Cronbach's alpha of 0.85.

2.4. Procedure

The study protocol was approved by the Research Projects Ethics Committee of the University of Cantabria, Spain (reference: 07/2021) and by the Faculty Board of each educational institution. The research team informed the students in their classes and seminars of the objectives of the study and the implications of their consent, requested the collaboration of the first- and fourth-year students and answered any doubts. The data collection period was from October 2021 to April 2022, using the Google Forms platform. Year group delegates were asked to distribute the questionnaire to the students through their usual networks.

2.5. Data analysis

All recorded variables were downloaded to Microsoft Excel (version 365) and the data were then exported to the Statistical Package for Social Sciences (SPSS.v28, Inc., Chicago, IL). The database was cleaned through logical and range tests, as well as through data consistency tests. The criterion for statistical significance was set at $p \leq .05$. First, a descriptive analysis of the main study variables was performed, followed by t-student tests to analyse differences in the study variables according to year group. Pearson's correlation coefficients were calculated to test the associations between the study variables. Hierarchical regression models were conducted to determine the relevant predictors of academic stress and psychological well-being. Finally, mediation models were estimated to determine whether resilience, anxiety and depression mediated between academic stress and psychological well-being. For these analyses, we used PROCESS SPSS Macro version 3.1, and 5000 bias-corrected bootstrap samples (Bolin, 2014). For these analyses, we used PROCESS SPSS Macro version 4.1, selecting models 81 and 5000 bias-corrected bootstrap samples.

3. Results

3.1. Sociodemographic results

All first-and fourth-year undergraduates from University of Castilla-La Mancha, the University of Cantabria, and the University of Seville were invited to participate ($N = 906$). Finally, three hundred and seventy Spanish university students formed the study sample ($M_{age} = 20.27$, $SD = 3.99$; 83.20 % women). The response rate was 40.84 % (53.90 % first-year and 22.83 % fourth-year students). The sample was divided into two groups: first-year undergraduates ($n = 283$; $M_{age} = 19.33$, $SD = 3.35$; 82.3 % women) and fourth-year undergraduates ($n = 87$; $M_{age} = $

23.34, $SD = 4.37$; 86.2 % women). Participants from bachelor completed the science/health sciences modality. The nursing faculties of universities provide four years undergraduate education and consist of 240 ECTS. The theoretical and clinical training curricula of the institutions was similar.

In accordance with current Spanish regulations, before the beginning of clinical practices, all students must present the negative certification from the Central Registry of Sexual Offenders to the university. Students acquire and integrate their theoretical learning and practical skills their practical learning progressively, through the subjects of *Clinical Stays* and *Practicum*. Clinical Stays are in second and third years and Practicum in fourth year, the clinical practices are carried out in health centers, hospitals, and social health centers. During the Clinical Stays (the first clinical placements), learning is more supervised and guided until fourth year students have more autonomous performance. Furthermore, during fourth year nursing care is progressing in complexity, including specialized services, such as intensive care unit (ICU), surgery, operating theatre, and hemodialysis. Importantly, during the period of our study, the fourth-year undergraduates had to perform highly complex care of COVID-19 mechanically ventilated patients in ICU.

3.2. Descriptive results

The descriptive statistics for the main study variables are summarized in Table 1. We found statistically significant higher levels of academic stress ($t = 3.57$; $p < .001$); problem-focused coping ($t = 3.66$; $p < .001$); emotion-focused coping ($t = 1.63$; $p = .10$); depressive symptoms ($t = 2.15$; $p = .03$); and anxiety symptoms ($t = 3.68$; $p < .001$) in the first-year students. Effect sizes for the differences between groups ranged between 0.26 and 0.45.

3.3. Correlation results

The bivariate correlation coefficients are presented in Table 2. Taking academic stress as the reference, the most significant results were as follows: academic stress presented a significant and direct association with clinical stress, emotion-focused coping, and depression and anxiety symptoms (all $ps < .01$). In contrast, academic stress was negatively related to resilience and psychological well-being ($ps < .01$). No statistically significant correlations were found for problem-focused coping and academic stress. However, this type of coping strategy was directly and significantly associated with resilience and psychological well-being, and indirectly with depressive symptoms.

3.4. Academic stress predictors

For the overall study sample, hierarchical regression models on academic stress were estimated with year of study, clinical stress, problem-focused coping, emotion-focused coping, depression symptoms, anxiety symptoms, and resilience (Table 3). The regression model showed 40 % explained variance, with year of study, clinical stress, and anxiety symptoms as main academic stress predictors.

3.5. Psychological well-being predictors

Linear regression models were implemented with academic stress, clinical stress, depression, anxiety, resilience, problem coping and emotional coping as predictors of psychological well-being (Table 4). The regression model showed 42 % explained variance, with academic stress, depression, resilience and both types of coping skills being the main psychological well-being predictors.

3.6. Mediators between academic stress and psychological well-being

The mediation model scheme is shown in Fig. 1. In the first

Table 1
Descriptive statistics of main study variables.

Variables	Total (N = 370)	1.° (n = 283)	4.° (n = 87)	p for difference	Cohen's d
Academic stress	32.69 (4.70)	33.16 (4.14)	31.14 (5.95)	<.001	0.44
Clinical stress	29.46 (6.04)	29.53 (5.88)	29.24 (6.57)	.70	0.05
Problem-focused coping	39.24 (9.40)	40.22 (9.18)	36.07 (9.47)	<.001	0.45
Emotion-focused coping	16.07 (5.19)	16.31 (4.96)	15.28 (5.82)	.10	0.20
Depressive symptoms	9.43 (4.62)	9.72 (4.57)	8.51 (4.67)	.03	0.26
Anxiety symptoms	11.43 (4.24)	11.87 (4.03)	9.99 (4.60)	<.001	0.45
Resilience	37.09 (5.88)	36.94 (5.60)	37.59 (6.72)	.37	0.11
Psychological well-being	127.67 (20.07)	128.73 (19.33)	124.21 (22.08)	.06	0.22

Note. Academic stress range: 1–45; clinical stress range: 1–45; problem coping range: 0–72; emotion-coping range: 1–48; depressive symptoms range: 1–20; anxiety symptoms range: 1–20; resilience range: 0–40; well-being range: 1–174.

Table 2
Pearson correlation coefficients (N = 370).

	1	2	3	4	5	6	7	8
1. Academic stress	–							
2. Clinical stress	0.48**	–						
3. Problem-focused coping	−0.05	−0.01	–					
4. Emotion-focused coping	0.26**	0.16**	−0.01	–				
5. Depressive symptoms	0.41**	0.13**	−0.17**	0.31**	–			
6. Anxiety symptoms	0.48**	0.24**	0.01	0.28**	0.73**	–		
7. Resilience	−0.19**	−0.10	0.41**	−0.24**	−0.32**	−0.24**	–	
8. Psychological well-being	−0.33**	−0.17**	0.47**	−0.33**	−0.43**	−0.28**	0.40**	–

** Significant correlation $p < .01$ (bilateral).
* Significant correlation $p < .05$ (bilateral).

Table 3
Hierarchical regression for academic stress (N = 370).

Step	Predictor	β	t	p	Adjusted R^2	ΔR^2
1	Year of study	−0.18	−3.57	<.001	0.03	0.03*
2	Year of study	−0.170	−3.85	<.001	0.25	0.22*
	Clinical stress	.47	10.49	<.001		
3	Year of study	−0.190	−4.09	<.001	0.26	0.01
	Clinical stress	.47−	10.49	<.001		
	Problem coping	0.07	−1.63	.10		
4	Year of study	−0.170	−3.82	<.001	0.28	0.03*
	Clinical stress	.44−	9.93	<.001		
	Problem coping	0.070	−1.57	.12		
	Emotional coping	.18	3.93	<.001		
5	Year of study	−0.140	−3.16	.002	0.37	0.08*
	Clinical stress	.42−	9.96	<.001		
	Problem coping	0.010	−0.31	.76		
	Emotional coping	.090	1.99	.05		
	Depression	.31	6.95	<.001		
6	Year of study	−0.110	−2.71	.01	0.39	0.03*
	Clinical stress	.39−	9.14	<.001		
	Problem coping	0.040	−0.89	.37		
	Emotional coping	.080	1.82	.07		
	Depression	.140	2.26	.02		
	Anxiety	.24	3.87	<.001		
7	Year of study	−0.110	−2.69	.01	0.39	<0.001
	Clinical stress	.39−	9.12	<.001		
	Problem coping	0.040	−0.76	.45		
	Emotional coping	.080	1.77	.08		
	Depression	.140	2.23	.03		
	Anxiety	.24−	3.86	<.001		
	Resilience	0.01	−0.14	.89		

Note. The data are presented as standardized regression coefficients.
* $p \le .001$.

Table 4
Regression on student's psychological well-being (N = 370).

Predictor	β	t	p	Adjusted R^2	ΔR^2
Academic stress	−0.17−	−3.06	.002*	0.42	0.43
Clinical stress	0.040	−0.86	.540		
Depression	.15	2.19	<.001		
Anxiety	380	−5.63	.320		
Resilience	.270	5.87	.05		
Problem coping	.38−	8.52	<.001		
Emotional coping	0.20	−4.71	<.001		

Note. The data are presented as standardized regression coefficients.
* $p \le .001$.

negatively associated with psychological well-being ($p < .001$) and ($p < .05$), respectively, and resilience was positively associated ($p < .001$). Path d shows that resilience was negatively associated with depression and anxiety ($p < .001$). Finally, the effect of academic stress on psychological well-being (path c) was significant, and, when introducing the mediators in the model, the effect of academic stress on psychological well-being was attenuated but remained significant, indicating a partial effect (Zhao et al., 2010). Thus, significant mediation paths were indirect effect (IE) 1, from academic stress to resilience and to psychological well-being; IE 2, from academic stress to depression to psychological well-being; and IE 4, from academic stress to resilience, to depression and to psychological well-being. The paths through anxiety as a mediator were non-significant.

4. Discussion

The aim of this study was to compare stress in 370 first- and fourth-year Spanish nursing students and to analyse the role of psychological variables as predictors of stress. The main results revealed that first-year nursing students presented higher levels of academic stress than their fourth-year counterparts, despite the latter engaging in clinical practice. Additionally, we found positive associations between academic stress and emotion-focused coping, depression and anxiety symptoms and negative associations with resilience and psychological well-being.
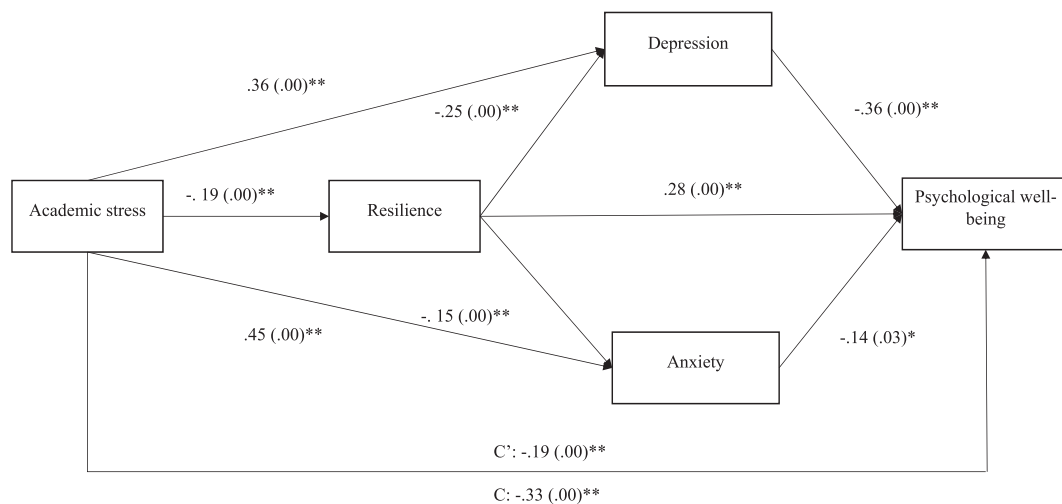
regression step (path a), academic stress was positively associated with depression and anxiety, and negatively with resilience ($p < .001$). In the next step regression step (path b), depression and anxiety were

Fig. 1. Mediation model scheme.
IE1 (Academic stress – Resilience – Psychological well-being) = −0.05 (0.02) [−0.09; −0.02].
IE2 (Academic stress – Depression – Psychological well-being) = −0.13 (0.02) [−0.20; −0.07].
IE3 (Academic stress –Anxiety– Psychological well-being) = 0.06 (0.03) [−0.01; 0.13].
IE4 (Academic stress – Resilience - Depression – Psychological well-being) = −0.02 (0.01) [−0.03; −0.01].
IE5 (Academic stress – Resilience - Anxiety – Psychological well-being) = −0.01 (0.00) [−0.00; 0.01].

Finally, regardless of year group, the most important predictors of academic stress were clinical stress and anxiety, while academic stress, depression, and coping skills were the most significant predictors of psychological well-being. Finally, resilience, associated with depression, was a mediating factor in the relationship between academic stress and psychological well-being. These results suggest that academic stress has a detrimental effect on the mental health of nursing students and that coping strategies and resilience might be protective factors, which should be fostered in interventions to alleviate the effects of stress and to enhance psychological well-being in nursing students.

In this study, higher academic stress was found among first-year students, in line with previous studies (Lavoie-Tremblay et al., 2022; Salvarani et al., 2020). Additionally, year of study was one of the most important predictors of academic stress. These relationships might be due to changes of environment and the increased academic demands that first-year students have to face (Kural and Özyurt, 2023). In this line, another study finds higher levels of stress associated with academic burnout in first-year students, and in students without clinical experience (Hwang and Kim, 2022), suggesting that nursing practice enhances students' adaptability and strategies to cope with the requirements of the degree (Salvarani et al., 2020). In contrast, a further study reports higher levels of academic stress in students in later years of study (Jimenez et al., 2010) (and higher general stress (Onieva et al., 2020). Differences in academic stress between studies could be due to the period of the semester or the year in which the measurement was taken, in the sense that, when the measurement is taken at the end of the semester, as in our study, academic stress is expected to be higher, especially in first-year students, who have a higher theory workload. Finally, academic stress levels were higher than clinical stress in both groups, with the former being the main predictor of poor psychological well-being, rather than clinical stress. This contrasts with previous studies, where students' perceived stress is mainly caused by clinical stressors (Gurková and Zeleníková, 2018). These divergences might be due to differences in academic programmes, which have varied in recent years and vary across countries.

Regarding clinical stress, our study revealed similar levels of stress in first- and fourth-year students, as reported in a previous study (Jimenez et al., 2010). This suggests that first-year students might experience some amount of clinical stress caused by expectations and perceived incompetence and that final-year students suffer less stress, despite the

higher load of clinical practice, as they develop skills and become more competent in the clinical environment (D'emeh and Yacoub, 2021). In contrast, a previous study reports higher clinical stress in later years of study due to increased demands of practical activities and aspects associated with the professional environment and communication, and care of patients. In this line, a further study suggests that the most stressful period in terms of clinical stress is the initial period of clinical practicum, which is in the second year of studies, where students perceive demands as exceeding their own resources, feeling they lacked knowledge and skills, reporting heavy assignments and workload and fear of making mistakes (Liu et al., 2022). In this case, students might develop strategies to cope with clinical environments (Labrague et al., 2018).

The results of our study partially support the hypothesis that problem-focused coping strategies are associated with lower stress and emotion-focused strategies are associated with higher stress (Lazarus and Folkman, 1984). In our study, emotion-focused strategies were associated with higher academic stress, coinciding with previous studies (Labrague et al., 2018; Wang et al., 2019). Moreover, emotional coping was a significant predictor of academic stress and both types of coping skills predicted psychological well-being. However, no significant association was found with problem-focused strategies and academic stress. These results are similar to those of previous studies that have found more solid associations in the case of emotional strategies than problem solving strategies (Gurková and Zeleníková, 2018) only find a small association between academic stressors and problem-solving coping. Meanwhile, Labrague et al. (2018) find that problem solving strategies are associated only with some domains of stress, such as stress from taking care of patients and clinical stress, while other domains, such as overall stress, stress from faculty and academic staff, stress from assignments and workload and stress from lack of professional knowledge and skills, are not associated with problem solving strategies. Finally, a meta-analysis study reports mixed results (Labrague et al., 2018), where coping strategies and their relationship with stress may be dependent on the context, and on the dimension of stress considered, such that strategies that are useful in some situations may not be so in others. Furthermore, our study showed problem-focused coping was negatively associated with depression and positively with resilience and psychological well-being, while emotion-focused strategies were associated with higher levels of depression and anxiety, and lower resilience

and psychological well-being, suggesting that indirect rather than direct associations might exist.

Our study found higher depression and anxiety levels in first year students, which might be due to the stressors that first-year students face (Kural and Özyurt, 2023; Willoughby et al., 2020). However, fourth-year students had lower psychological well-being, coinciding with a previous study (He et al., 2018), which might be due to emotional exhaustion that increases over time (Ríos-Risquez et al., 2016). Additionally, our study revealed that high levels of depression and anxiety were both associated with academic stress, which is consistent previous studies revealing strong associations between anxiety, depression, and stress (Brandy et al., 2015). Finally, our data showed that academic stress and depression had an impact on psychological well-being affecting students' psychological functioning, as reported in previous studies (He et al., 2018; Yüksel and Bahadir-Yilmaz, 2019). However, in a combined model, anxiety did not have a significant impact on psychological well-being, which might suggest that anxiety exerts its effect on psychological indirectly through another variable. It might also be because the relationship between academic stress and anxiety is not linear, such that certain levels of moderate anxiety are associated with good performance and are common in students' lives.

Finally, resilience was found to be a primary predictor of psychological well-being, coinciding with a previous study (He et al., 2018). Furthermore, the mediation analysis revealed that academic stress exerted a direct and an indirect effect on psychological well-being through resilience and through depression, meaning that, in an academically stressful situation, nursing students who have resilience had low risk of depression and, in turn, a low risk of poor psychological well-being. These findings are similar to those of previous studies showing that resilience has a mediating role between stress and depression and anxiety (Devi et al., 2021), mediates the effect of academic stress on quality of life (Berdida and Grande, 2023) and mediates between academic stress and learning (Berdida, 2023). These results, taken together, suggest that resilience plays a key role in enabling students to cope with stressful situations, protecting them from the negative effect of stress on their mental health and psychological well-being.

4.1. Strengths and limitations

This study has some strengths, such as a considerable sample size, the inclusion of validated measures, the consideration of different types of stress and the inclusion of a wide range of variables in a combined model, which allows for the analysis of combined interactions between related variables. However, some limitations should be considered. Firstly, the cross-sectional nature of the study prevents us from making cause-effect inferences. Longitudinal data would yield more complete information on within-participant development in each of the variables analysed. Particularly, research has focused on first and fourth-year students since the stressors are clearly different. Further research could consider the inclusion of second- and third-year students in order to have insights on how students develop their coping strategies from first grade through consecutive years. Second, this study compared first and fourth academic years, however it would be advisable to homogenize study samples according to level, since the response rate of fourth-year students was smaller than that of their first-year counterparts. It would be challenging since fourth-year students were not physically present on campus due to their engagement with clinical placements which increases the difficulty of reaching them. To draw detailed conclusions, this question should be the subject of more in-depth analysis in future studies.

4.2. Conclusions

The aim of this study was to analyse academic stress in a sample of first- and fourth-year students and its associations with mental health and protective factors. Our results revealed that stress is a common experience during nursing education, appearing to be higher in first-year undergraduates, who, however, also experienced higher levels of stress, depression, and anxiety. In contrast, the level of psychological well-being in fourth-years students was lower, suggesting that as students progress through their studies, they develop knowledge and skills to cope with stress and academic situations, but that their level of well-being declines, possibly due to increased levels of exhaustion. Meanwhile, resilience and coping strategies are protective factors that might mitigate the effects of academic stress on mental health and psychological well-being. Thus, this study highlights the need to develop interventions to enhance coping strategies and resilience in order to mitigate the effects of a demanding curriculum on the psychological well-being of nursing students.

CRediT authorship contribution statement

Ma Eugenia Visier-Alfonso: Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. **Carmen Sarabia-Cobo:** Writing – review & editing, Supervision, Project administration, Data curation, Conceptualization. **Ana Isabel Cobo-Cuenca:** Writing – review & editing, Investigation, Data curation. **Marta Nieto-López:** Writing – original draft, Supervision, Project administration, Methodology, Investigation, Data curation, Conceptualization. **Rigoberto López-Honrubia:** Writing – review & editing, Writing – original draft, Data curation, Conceptualization. **Raquel Bartolomé-Gutiérrez:** Writing – review & editing, Investigation, Data curation. **Ana Rosa Alconero-Camarero:** Writing – review & editing, Investigation, Data curation. **José Rafael González-López:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Data curation, Conceptualization.

Declaration of competing interest

None.

Data availability

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

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