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Academic stress and academic performance among early childhood education students in Peru

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ABSTRACT

Academic stress is widely assumed to impair academic performance in higher education; however, empirical evidence remains inconsistent, particularly in professional teacher-training programs. This study examined the relationship between perceived academic stress and academic performance among 116 undergraduate students (18–25 years) enrolled in an early childhood education program at a public university in Peru. A quantitative cross-sectional correlational design was employed. Academic stress was measured using the perception of academic stress scale, while academic performance was obtained from official grade point averages (GPA), ensuring objective assessment. Data were analyzed using multiple regression and non-parametric tests (Mann–Whitney U and Kruskal–Wallis H). Results indicated moderate stress levels (M=3.65) and stable academic performance (M GPA=14.72). Academic stress did not significantly predict GPA, whereas age emerged as the only significant positive predictor. Gender and academic cycle showed no significant effects. These findings suggest that academic stress may not necessarily undermine performance and highlight the potential role of maturity and adaptive capacities in supporting resilience among future teachers.

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1. INTRODUCTION

Academic stress has become a pervasive concern in higher education worldwide, as university students face increasing academic demands, time pressures, and emotional challenges that may compromise both well-being and academic achievement [1]. In academic contexts, stress is commonly defined as the psychological and physiological response that occurs when students perceive academic requirements as exceeding their available coping resources [2]. Typical academic stressors include examinations, assignment deadlines, heavy workloads, and fear of failure, which may lead to impaired concentration, anxiety, and reduced academic functioning [3]. Students enrolled in professional training programs, such as early childhood education, may be particularly exposed to these pressures, as they are required to simultaneously

master pedagogical knowledge, classroom management skills, and rigorous academic content [4]. This finding directly answers the central research question, indicating that perceived academic stress does not function as a significant predictor of academic performance in this sample [5].

The growing concern about academic stress has generated an important debate in higher education research: whether perceived stress actually translates into measurable academic consequences. Although academic stress is often assumed to negatively influence learning outcomes, empirical findings remain inconsistent across educational contexts. In particular, limited evidence exists regarding how academic stress relates to objective academic performance in professional teacher-training programs in Peru. Clarifying this relationship is essential because it can inform institutional strategies aimed at improving student well-being while maintaining academic success. Therefore, examining whether perceived academic stress meaningfully predicts academic performance represents a relevant research problem in contemporary teacher education [5].

Theoretical approaches to academic stress have frequently been grounded in Selye's general adaptation syndrome (GAS), which conceptualizes stress as a physiological response progressing through the stages of alarm, resistance, and exhaustion and distinguishes between eustress, a positive form of stress that can enhance motivation and performance, and distress, which may impair cognitive functioning and academic achievement [6]. Complementing this physiological perspective, Lazarus and Folkman's transactional model of stress and coping conceptualizes stress as a dynamic interaction between individuals and their environment, emphasizing that stress responses depend on cognitive appraisal and the perceived availability of coping resources [7]. Together, these complementary theoretical frameworks provide the conceptual foundation for understanding how academic demands may either facilitate adaptive learning processes or contribute to psychological strain and reduced educational performance. Complementarily, Lazarus and Folkman's transactional model of stress and coping emphasizes that stress outcomes depend on individuals' cognitive appraisal of demands and the coping strategies they employ. From this perspective, students who adopt effective problem-focused strategies, such as planning and time management, or emotion-focused strategies, such as seeking social support, may mitigate the negative effects of stress on academic performance [8]. Conversely, when coping resources are insufficient, stress may become a detrimental factor that undermines academic achievement. This theoretical duality offers an explanation for the inconsistent empirical relationship observed between academic stress and performance [9], [10].

Empirical evidence reflects this inconsistency. Some studies report that high levels of academic stress negatively affect performance through mechanisms such as cognitive overload, emotional exhaustion, and reduced decision-making capacity. Other studies, however, indicate that students with strong coping skills or resilience are able to maintain satisfactory academic outcomes despite experiencing considerable stress [11]–[14]. Moreover, the relationship between stress and performance appears to be moderated by demographic variables, including age, gender, and level of study. Research suggests that older or more experienced students often demonstrate higher academic performance, potentially due to greater maturity, clearer academic goals, and improved self-regulation [15], [16]. Although female students frequently report higher perceived stress levels, this does not consistently translate into lower academic performance when compared with male students [17].

Despite the breadth of international research, limited evidence is available regarding how these dynamics operate within Peruvian higher education, particularly in professional teacher-training programs. Early childhood education students face distinctive academic, emotional, and practical demands linked to pedagogical preparation and professional identity formation; however, it remains unclear whether perceived academic stress meaningfully affects objective academic performance in this context. Importantly, many prior studies rely heavily on self-reported academic outcomes, which may introduce bias and limit the validity of conclusions [12].

Addressing this gap is essential for evidence-based decision-making in student support services and curriculum design. Clarifying whether academic stress constitutes a meaningful determinant of academic performance or whether other factors such as demographic maturity play a more central role can inform the development of more effective educational interventions. The central scientific question guiding this study is whether perceived academic stress functions as a significant predictor of objectively measured academic performance (grade point averages or GPA) among early childhood education students, or whether demographic factors such as age and gender exert a stronger influence on academic outcomes. Specifically, this study asks whether academic stress independently predicts academic performance when demographic variables are controlled, thereby testing the assumption that stress directly undermines achievement in professional teacher-training contexts.

The novelty of this study lies in its use of objectively measured academic performance (official GPA) rather than self-reported achievement to examine the role of academic stress within a professional teacher-training context. Additionally, this research focuses on early childhood education students in Peruvian higher education, a population that has been underrepresented in prior empirical studies, while simultaneously analyzing demographic factors and the multidimensional structure of academic stress.

Accordingly, this study examines the relationship between academic stress and academic performance among early childhood education students at a Peruvian university. Specifically, it investigates: i) the distributional characteristics of academic stress and GPA; ii) whether academic stress predicts academic performance when demographic variables are considered; iii) whether academic performance differs across stress levels and gender; iv) the latent structure of academic stress; and v) the relative contribution of stress and demographic predictors to academic performance.

2. METHOD

2.1. Study design

The study was based on a quantitative and correlational explanatory design and studied the factors that relate to academic stress and academic achievement among the students of the early childhood education course at a Peruvian university. It was cross-sectional and non-experimental, such that variables were observed in their natural academic environment without any manipulation and intervention. This design was selected due to the ability of the researchers to examine relationships involving stress, demographic factors and performance outcomes in the real-life university setting, which promoted ecological validity.

2.2. Participants

The study participants were 116 undergraduate students studying the early childhood education program in the 2023 academic year. Participants were selected using a simple random sampling procedure. The list of students enrolled in the early childhood education program during the study period was obtained from the academic administration of the university and served as the sampling frame. Each student was assigned a numerical identifier, and a random number generator was used to select participants. This procedure ensured that all eligible students had an equal probability of inclusion in the sample and minimized potential selection bias. The sample was selected at random in three academic cycles (V, VII, and IX) and students of various levels of their program were represented. Students had to have taken at least two semesters of study to be eligible, a qualifying factor set to ensure that they would have enough academic exposure to assess both levels of stress and the outcome of performance. The age of the participants also had a balance between traditional and slightly older learners and was 18–25 years of age, and the gender proportion was equal, without any gender bias. Student representation in terms of different academic levels and demographic groups diversified the sample and enhanced the extrapolation of the results to the overall population of the early childhood education students at the university.

2.3. Instruments

Two major instruments were used in data collection. The initial one was the perception of academic stress scale created by Zheng and Peng [18] and modified to this research. This scale comprised of 30 items that assessed stress related to academic activities with the dimensions that included time management, workload, emotional reactions and physical exhaustion. The answers were given on a 5-point Likert scale (1=strongly disagree; 5=strongly agree) that enabled measuring the level of perceived stress among students. The Cronbach's alpha coefficient of internal consistency test was found to be 0.89, which implies that the instrument was internally consistent and therefore, the instrument was appropriate in measuring stress among this group of students. The second tool that was used in the determination of academic performance was the GPA which was obtained through official records held by the academic office of the university. The Peruvian grading system scores 0–20 points with the better the score the better the performance. GPA was selected as the outcome measure since it is objective and has been recognized as a valid measure of student performance at higher education institutions. The GPA was used to be sure of the aspect of accuracy in determining the level of performance and prevent the possibility of bias that would have resulted in self-reported academic performance.

The perception of academic stress scale was used to measure students perceived academic stress. The instrument has been widely applied in university populations and demonstrates strong psychometric properties. For the present study, the Spanish-language version of the scale was used. Minor linguistic adjustments were made to ensure clarity and contextual relevance for the Peruvian higher education setting; however, the original structure and item content of the scale were preserved. Prior to the main data collection, the instrument was reviewed by two specialists in educational psychology to confirm content clarity and contextual appropriateness.

2.4. Data collection procedures

Data collection was to be done in two stages. The first stage required the participants to fill the academic stress scale in the classrooms at the onset of planned sessions to maximize participation.

The objectives of the study were outlined and informed consent forms were given to the respondents before the survey was carried out, and all were signed according to the ethical standards set by the American psychological association. The questionnaires were filled by paper with guidance of the trained research assistants who saw to it that instructions were adhered to properly, anonymity of the responses was observed, and answered all questions posed by the participants. Students took an average of 20 minutes to fill the survey. The official GPA records of the participants were obtained through the administrative office of the university during the second stage of data collection and subsequently, anonymized, and compared with their results on the stress survey by using unique codes. This process ensured accuracy of the performance data and that the identities of the student body remain confidential. The combination of the results of the stress survey and the validated GPA data guaranteed the high methods rigor and reduced the chances of measurement bias.

2.5. Data analysis

Data were analyzed using SPSS version 26. Descriptive statistics were computed to examine the distributional properties of academic stress and academic performance, including means, standard deviations, and dispersion patterns. Inferential analyses were conducted in a stepwise manner aligned with the study objectives. Linear regression analysis was used to assess the association between academic stress and GPA and to evaluate the contribution of demographic variables (age, gender, and academic cycle). Non-parametric tests were applied due to non-normality in some distributions: the Kruskal–Wallis H test examined GPA differences across stress categories, and the Mann–Whitney U test compared GPA by gender. Exploratory factor analysis with varimax rotation was performed to identify the latent dimensions of academic stress, with factor loadings ≥0.70 considered substantive. Finally, standardized regression coefficients with 95% confidence intervals were examined to compare the relative contribution of stress and demographic predictors to academic performance.

3. RESULTS

Academic stress levels among early childhood education students were generally moderate, with a mean score of 3.65 (SD=0.62) on the 1–5 scale, indicating noticeable but non-extreme perceptions of academic pressure. Most stress scores were concentrated between 3.0 and 4.3, reflecting heterogeneity in perceived demands without the presence of extreme stress conditions. Academic performance, measured through official GPA records, showed a mean value of 14.72 (SD=1.81) on the 0–20 grading scale, as shown in Figure 1. The majority of GPA scores fell within the 13–16 range, suggesting relatively stable academic outcomes across the sample. The concurrent presence of moderate stress variability and a comparatively narrow GPA distribution indicates that students differed in their stress perceptions while maintaining similar levels of academic achievement. This distributional pattern provided sufficient variability to support subsequent inferential analyses assessing the association between academic stress, demographic characteristics, and academic performance.

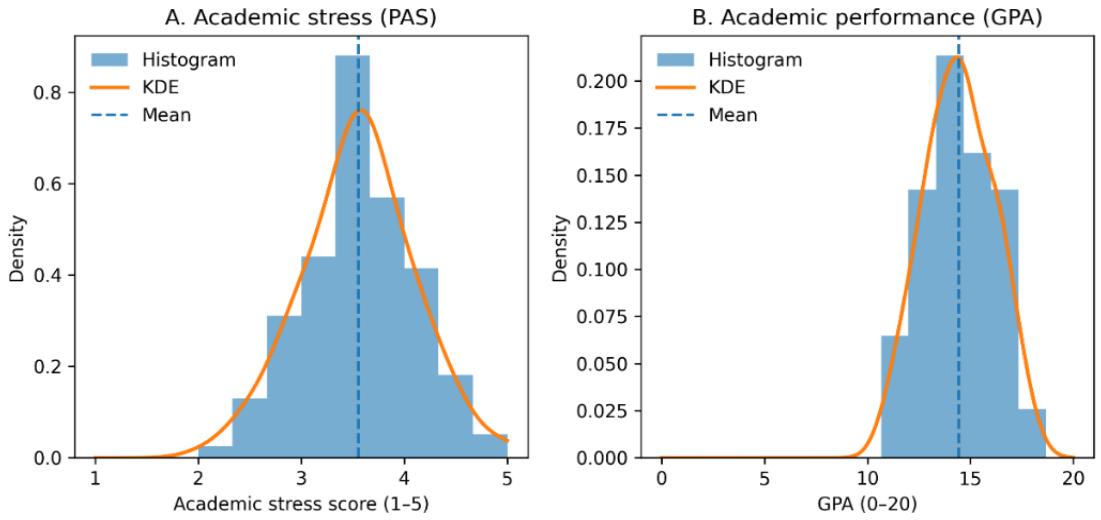

Figure 1. Distribution of academic stress and academic performance among early childhood education students

Academic stress did not show a significant association with academic performance. The linear regression analysis indicated a near-zero slope between academic stress scores and GPA, confirming that variations in perceived stress were not systematically related to changes in academic outcomes ($\beta \approx 0.04$, $p > 0.05$). GPA values remained broadly similar across the full range of stress scores (1–5), suggesting that both lower and higher stress levels were associated with comparable academic performance.

In contrast, age exhibited a consistent positive relationship with GPA. Students in higher age ranges (approximately 22–25 years) tended to achieve higher GPA values than younger students (18–20 years), regardless of their reported stress levels, as shown in Figure 2. This pattern indicates that demographic maturity contributes more substantially to academic performance than perceived academic stress within this cohort. Overall, the results reinforce that academic stress does not function as a meaningful predictor of GPA, whereas age represents a relevant demographic factor associated with improved academic outcomes.

Academic performance did not vary significantly across levels of academic stress. Median GPA values were highly comparable among students reporting low, moderate, and high stress, with central tendencies clustered around 14.8–15.2 points. The interquartile ranges overlapped substantially across all stress categories, indicating similar performance dispersion regardless of stress intensity. These distributional patterns are consistent with the non-parametric analysis, which showed no significant differences in GPA across stress groups (Kruskal–Wallis $H = 0.432$, $p = 0.806$), as shown in Figure 3.

Gender-based comparisons likewise revealed minimal differences in academic outcomes. Median GPA values for female and male students differed by less than 0.3 points, and the overlapping interquartile ranges indicate comparable performance variability between groups, as described in Figure 3. This pattern aligns with the Mann–Whitney U test results ($p > 0.05$), confirming that gender does not significantly influence academic performance in this sample. Overall, the results indicate that neither stress intensity nor gender explains meaningful variation in GPA, reinforcing the conclusion that academic performance among early childhood education students is largely independent of these factors.

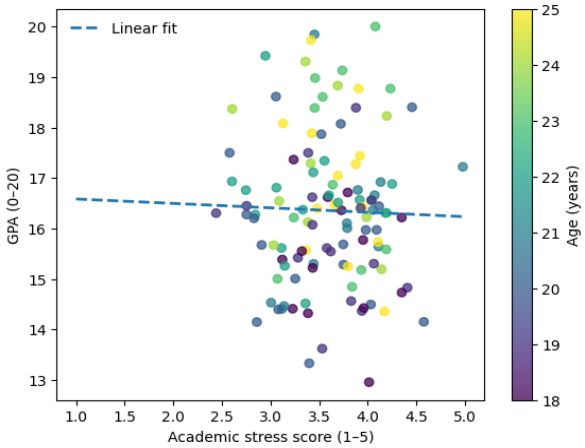

Figure 2. Relationship between academic stress and GPA moderated by age

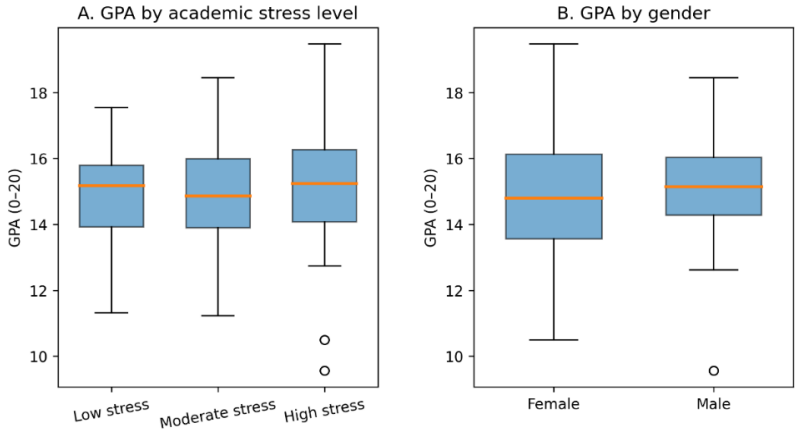

Figure 3. Academic performance across stress levels and gender

Exploratory factor analysis using varimax rotation revealed a clear and well-defined three-factor structure underlying academic stress. The first factor, academic pressure, exhibited strong loadings for assignment deadlines (0.81), examination stress (0.79), and fear of failure (0.75), indicating that evaluative demands and workload-related expectations constitute a broad and dominant dimension of perceived stress, as shown in Figure 4. The consistency of high loadings across multiple items suggests that academic pressure represents a multifaceted construct encompassing both performance evaluation and task management demands.

The second factor, emotional stress, was primarily characterized by emotional exhaustion, which showed a high loading (0.80). This finding indicates that affective depletion operates as a distinct stress dimension, largely independent of academic workload intensity, as presented in Figure 4. The third factor, physical fatigue, was defined by lack of sleep, with a strong loading (0.77), reflecting a somatic component of academic stress associated with physiological strain. Cross-loadings across factors were minimal (generally<0.20), supporting strong factorial separation and construct clarity. Overall, the results confirm that academic stress among early childhood education students is multidimensional, comprising academic pressure, emotional stress, and physical fatigue as empirically distinct yet complementary components.

Standardized regression coefficients with 95% confidence intervals were examined to evaluate the relative contribution of each predictor to academic performance. Age emerged as the only meaningful predictor of GPA (β=0.21, 95% CI [0.05, 0.37]), indicating a positive association between demographic maturity and academic outcomes as described in Figure 5. In contrast, academic stress showed a very small effect size (β=0.04, 95% CI [−0.08, 0.10]), with confidence intervals crossing zero, confirming the absence of a significant relationship. Similarly, gender (β=0.02, 95% CI [−0.06, 0.08]) and academic cycle (β=−0.03, 95% CI [−0.09, 0.03]) did not demonstrate significant contributions to GPA, as shown in Figure 5. The concentration of confidence intervals around zero for these predictors indicates limited explanatory value. Overall, the model-level comparison highlights age as the primary determinant of academic performance, while academic stress and other demographic variables contribute minimally.

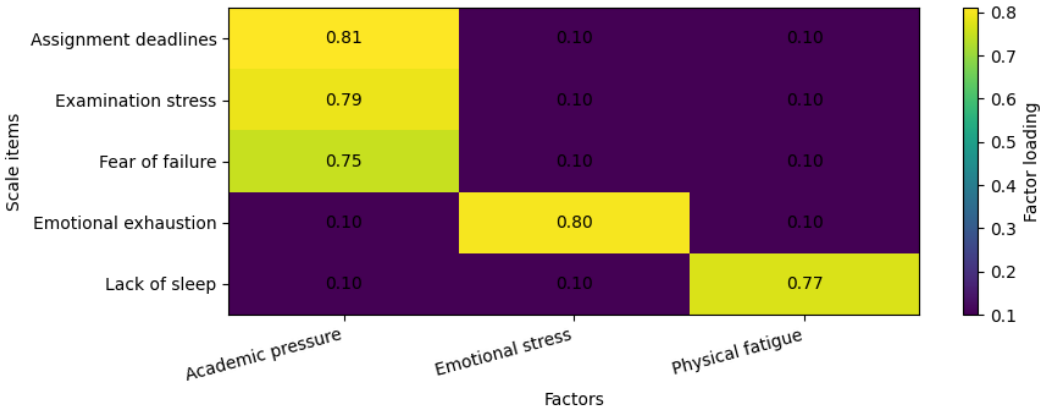

Figure 4. Multidimensional structure of academic stress derived from exploratory factor analysis

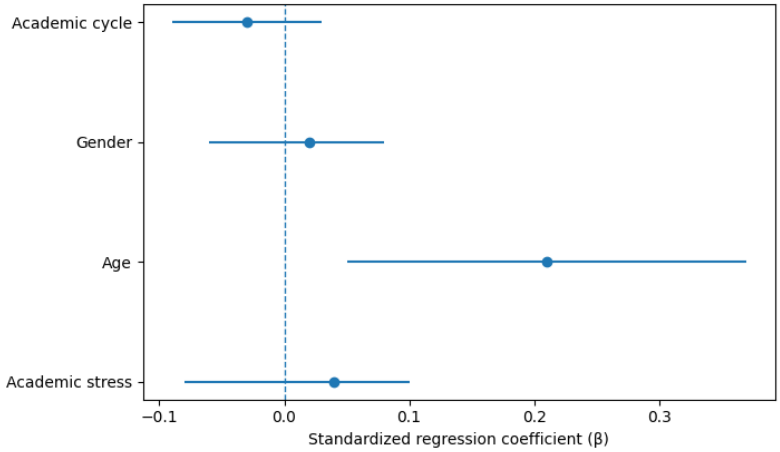

Figure 5. Relative contribution of predictors to academic performance

4. DISCUSSION

This study examined the relationship between academic stress and academic performance among students enrolled in the early childhood education program at a Peruvian university. Contrary to the commonly held assumption that higher stress levels inevitably impair academic outcomes, the findings indicate that academic stress did not significantly predict GPA. From a theoretical perspective, these findings can be interpreted through the transactional model of stress and coping, which suggests that the academic consequences of stress depend largely on how individuals appraise and manage demanding situations. The absence of a significant relationship between academic stress and GPA in this study may indicate that many students possess sufficient coping resources to regulate stress without experiencing academic decline. This interpretation aligns with the concept of adaptive stress responses, where moderate levels of perceived pressure may coexist with stable academic functioning when students employ effective self-regulation strategies such as planning, time management, and social support cohort [19], [20]. In this sense, the results contribute to the growing body of evidence suggesting that academic stress does not necessarily translate into negative academic outcomes, particularly among students who demonstrate resilience and adaptive coping capacities. This pattern was consistent across multiple analytical procedures, including linear regression and non-parametric tests.

Although students reported moderate levels of academic stress, academic performance remained relatively stable, suggesting that stress intensity alone does not explain variation in achievement within this cohort [19], [20]. Therefore, the primary empirical answer to the study's scientific question is that academic stress, whether examined globally or dimensionally, does not independently explain variation in GPA, whereas age demonstrates a meaningful positive association with academic performance. This conclusion is supported by convergent quantitative evidence, including objective GPA data obtained from official university records, consistent null associations observed across multiple analytical approaches (linear regression and non-parametric tests), and narrow confidence intervals centered around zero, which collectively indicate a robust absence of a meaningful stress–performance relationship in this sample.

These results differ from studies reporting a negative association between academic stress and performance through mechanisms such as cognitive overload, impaired concentration, and burnout [21], [22]. However, they align with research indicating that academic stress does not uniformly lead to poorer outcomes, particularly when students possess effective coping strategies or benefit from supportive academic environments [23]–[25]. Within teacher-education programs, students may gradually develop adaptive behaviors such as planning, emotional regulation, and peer support, which help buffer the academic impact of stress and allow performance to be maintained under moderate pressure [26], [27]. The present findings therefore support interpretations of academic stress as a contextual and moderated experience rather than a uniformly detrimental condition.

A key finding of this study is that age emerged as the only meaningful predictor of academic performance. Older students consistently achieved higher GPA values, independent of their reported stress levels. This result is consistent with previous research suggesting that more mature or experienced students tend to demonstrate greater academic persistence, clearer goal orientation, and more refined time-management and self-regulation skills [28], [29]. Similar observations reported by Gkintoni *et al.* [30] indicate that older learners often exhibit stronger stress-regulation mechanisms and more stable academic engagement. Collectively, these findings highlight the importance of developmental and experiential factors in shaping academic achievement, suggesting that demographic maturity may play a more influential role than perceived stress intensity [31].

No significant gender differences in academic performance were observed. Female and male students displayed comparable GPA distributions, despite evidence from earlier studies indicating that female students often report higher levels of perceived stress [32]. The absence of performance differences suggests that variations in stress perception do not necessarily translate into academic disadvantage. In early childhood education programs, shared professional motivations and pedagogical orientations may promote adaptive coping and resilience across genders, thereby reducing the academic impact of stress-related differences [33], [34].

The exploratory factor analysis further supports the conceptualization of academic stress as a multidimensional construct, encompassing academic pressure, emotional stress, and physical fatigue. Academic pressure reflected evaluative and workload-related demands, whereas emotional stress and physical fatigue captured affective and physiological aspects, respectively. This structure is consistent with previous research emphasizing that academic stress involves both cognitive evaluative and affective physiological components and should not be treated as a single, homogeneous construct [35], [36]. Importantly, none of these stress dimensions showed a significant association with GPA, reinforcing the conclusion that academic stress whether examined globally or by dimension does not independently undermine academic performance in this population [37].

Consequently, the findings challenge deficit-based interpretations of academic stress and underscore the importance of moderating factors, particularly age-related maturity and adaptive capacity, in determining whether stress translates into academic consequences. From an educational perspective, the results suggest that institutional interventions should extend beyond an exclusive focus on stress reduction and instead emphasize the development of adaptive coping strategies, self-regulation, and professional resilience. For early childhood education programs, addressing both the broad demands associated with academic pressure and the more specific risks related to emotional exhaustion and physical fatigue may contribute to improved student well-being without assuming inevitable declines in academic performance.

These findings also have practical implications for teacher education programs. Rather than focusing exclusively on reducing academic stress, universities may benefit from implementing interventions that strengthen students' coping skills, emotional regulation, and academic resilience. Programs that promote time management, peer support networks, and reflective learning practices could help future teachers manage academic pressures more effectively while maintaining academic performance. Additionally, fostering resilience and adaptive coping strategies during teacher preparation may have long-term benefits, as educators frequently encounter stressful professional environments. Therefore, integrating well-being and resilience training into teacher education curricula may support both academic success during university studies and professional sustainability in future teaching careers.

4.1. Implications of the findings

The findings indicate that academic stress alone is not a decisive determinant of academic performance among early childhood education students. This suggests that institutional policies should not rely exclusively on stress-reduction approaches but should prioritize strengthening students' adaptive coping skills, self-regulation, and resilience, particularly those related to time management and emotional regulation. The positive role of age highlights the importance of supporting younger students in developing maturity-related competencies that facilitate academic success.

4.2. Future usefulness and directions

These results will be helpful for guiding future research and practice by encouraging longitudinal studies that examine how coping strategies, resilience, and institutional support interact with academic stress over time. Future work should also include larger, multi-institutional samples, and incorporate additional contextual variables to better understand how academic stress influences learning trajectories across different stages of higher education.

5. CONCLUSION

The key finding of this study is that academic stress is not a significant determinant of academic performance, while age represents the only consistent predictor of GPA. The evidence supporting this conclusion is based on a cross-sectional quantitative design using validated stress measures, objective academic performance indicators, and multiple complementary statistical analyses that yielded consistent results. This study demonstrates that academic stress does not constitute a significant determinant of academic performance among early childhood education students in a Peruvian higher-education context. Although students reported moderate levels of perceived academic stress, their academic outcomes remained relatively stable, and stress intensity showed no meaningful association with GPA. Instead, age emerged as the only consistent predictor of academic performance, suggesting that maturity, experience, and improved self-regulation play a more influential role in shaping academic achievement than stress alone. These findings challenge deficit-based assumptions that academic stress inevitably undermines student performance and highlight the importance of adaptive coping and resilience in professional teacher-training programs. The principal contribution of this study lies in demonstrating, using objectively measured academic performance data, that perceived academic stress does not necessarily translate into reduced academic achievement in teacher-training contexts. By focusing on early childhood education students in a Peruvian university, this research expands the limited empirical evidence available in Latin American teacher education programs. These findings suggest that educational policies and institutional support systems should prioritize the development of resilience, academic self-regulation, and adaptive coping skills rather than concentrating solely on stress reduction. Strengthening these competencies during teacher preparation may enhance both academic success during university studies and long-term professional sustainability in teaching careers.

From an educational perspective, the results indicate that institutional efforts should extend beyond stress reduction strategies and prioritize the development of self-regulation, time management, and professional coping skills that support sustained academic success. Future research should employ longitudinal designs, larger and more diverse samples, and additional contextual variables to further explore

how academic stress interacts with developmental, institutional, and pedagogical factors across different stages of higher education. Despite these contributions, several limitations should be acknowledged. First, the study was conducted within a single public university, which may limit the generalizability of the findings to other institutional or cultural contexts. Second, the cross-sectional design prevents the identification of causal relationships between academic stress and academic performance. Future studies should therefore employ longitudinal approaches and larger multi-institutional samples to better understand how stress, coping strategies, and academic outcomes evolve over time. No additional information is required to interpret the present findings. The conclusions are supported by objective academic performance data, validated stress measures, and consistent results across multiple analytical approaches. Relevant limitations and directions for future research have been explicitly acknowledged.

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AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

INFORMED CONSENT

We have obtained informed consent from all individuals included in this study.

ETHICAL APPROVAL

The research related to human use has been complied with all the relevant national regulations and institutional policies in accordance with the tenets of the Helsinki Declaration and has been approved by the authors' institutional review board or equivalent committee.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, [AC-C], upon reasonable request.

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