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Academic burnout and family communication as predictors of life satisfaction in Peruvian university students

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This study aimed to determine if academic burnout and family communication predict life satisfaction in Peruvian university students. The design was cross-sectional predictive, and 708 Peruvian university students participated. The Maslach Burnout Inventory (MBI), the Family Communication Scale (FCS), and the Satisfaction with Life Scale (SWLS) were used to obtain information on the variables. Descriptive and inferential analysis used structural equation modeling and the Robust Maximum Likelihood Estimator. The results present a negative relationship between academic burnout and Life Satisfaction with a significant estimate of -0.849 ($p < 0.001$), with a beta coefficient (β) of -0.469 , and a positive relationship between Family Communication and Life Satisfaction, showing a significant positive estimate of 0.436 ($p < 0.001$), with a beta coefficient (β) of 0.420 . These results confirm the need to implement programs that provide guidance to students on academic burnout and how to prevent it. Likewise, strategies to improve family communication must be incorporated in order to improve students' life satisfaction. In conclusion, these findings confirm that AB and FC are predictive factors of LS, academic burnout decreases life satisfaction, and family communication increases life satisfaction in Peruvian university students.

KEYWORDS

academic burnout, family communication, life satisfaction, university students, Peruvian university students

1 Introduction

Concern for physical and mental well-being during and after the COVID-19 pandemic, with far-reaching effects on people, has generated interest in conducting studies on the factors contributing to or interfering with life satisfaction oriented to SDG 3 health and well-being (World Health Organization, 2024). A study carried out in 32 countries found that the highest levels of life satisfaction are in family relationships at 78% and education at 80% (IPSOS, 2023). However, in recent years, university students have expressed exhaustion in academic activities, better known as academic burnout (Tran et al., 2023). Another study carried out during the Colombia pandemic found that most students observed a high level of open communication in their families, and only a minority stated that they perceived offensive communication. Therefore, open family

communication was a protective factor against mental exhaustion, while offensive communication was a risk factor (Garcés-Prettel et al., 2022). Furthermore, it is essential to consider that mental health also involves using our abilities to thrive, achieve our goals, and experience greater life satisfaction as part of a greater community (Pan American Health Organization, 2023).

Likewise, in recent years, mental health problems have increased due to various factors, such as the COVID-19 pandemic and its effects on health, the economy, and education, among others, and the action plan that has been implemented shows slow progress (World Health Organization, 2023). It is necessary to move from proposals to action, considering that you cannot enjoy health without mental health (Pan American Health Organization, 2023).

1.1 Literature review

Burnout, understood as exhaustion, is a severe problem for public health and in studies carried out (Hernández et al., 2021), a high level of burnout was found in university students, caused by different factors such as an overload of academic activities (Kwak et al., 2021). The postponement of academic activities, constant access to social networks, and using other Information and Communications Technologies (Hidrobo Guzmán et al., 2023). Another study found that academic burnout is correlated with low-quality sleep, anxiety, and depression traits, with a greater prevalence in students in their final years (Ochoa et al., 2022). Furthermore, life satisfaction plays a transcendental mediating role between academic burnout and social support (Ye et al., 2021) and between the need for achievement and burnout, resilience and life satisfaction play a significant mediating role (Bozkur and Güler, 2023).

On the other hand, family communication could favor the psychological well-being of students (Garcés Coca and Mejía Rubio, 2023), since open communication with parents, based on respect, empathy, and honesty (Cudris-Torres et al., 2020), acts as a protective element for the mental health of university students in crises and can contribute to the prevention of emotional and mental risk situations (Garcés Prettel et al., 2023). In this regard, some previous studies stated that greater openness is estimated in communication with the mother than with the father (Araujo-Robles et al., 2021). Furthermore, while family communication increases, self-esteem will also increase (Arias Quinatoa and Escobar Parra, 2023).

Family communication is defined as the ability to transmit information about feelings, emotions, ideas, thoughts of satisfaction and needs between family members, as well as the ability to discuss ideas and mediate conflicts (Copez-Lonzoy et al., 2016; Olson, 2000). Although family communication and family support are components of family systems theory (Wills-Ibarra et al., 2024), but it differs in that family communication is the medical process in which family members exchange information and feelings (Achury and Pinilla, 2016; Castro Castañeda et al., 2019); and family support is related to the support that family members provide to emotionally, physically or economically assist family members (dos Santos et al., 2024; Herrera-Pastor et al., 2020).

Evidence in the literature shows a relationship between academic burnout and the family environment (Luo et al., 2020). Under the family circumplex model, family communication is part of the central

dimensions of family systems (Olson, 2000) and has a critical impact on individual development, behavioral problems, academic adjustment, and subjective well-being (Cummings et al., 2013). Students who have a healthy home environment with good family communication experience fewer attacks and frustrations and reduce negative feelings of academic burnout (Shin et al., 2012). Likewise, the literature supports that parental involvement effectively promotes academic engagement and achievement (Castro et al., 2015). It was recently discovered that negative family relationships, especially parents, are an important predictor of academic burnout (He et al., 2022; Jiang et al., 2023).

1.2 Justification

In Peru, disparities along with low academic resources are linked to higher levels of stress (Huanca-Arohuanca et al., 2020), and there is little regional research that addresses burnout syndrome (Sardón et al., 2024). Along with this, the in-person return to classrooms after COVID-19 affected students (Morales, 2022) and their teachers (Carranza Esteban et al., 2022; Jaguaco et al., 2022), who were somehow more comfortable in the virtual format. On the other hand, Peru is one of the countries with the highest percentage of family violence and this is due in part to unhealthy communication patterns (Cjuno et al., 2023). Likewise, the prolonged closure of schools and universities could affect tension and decrease family stability (Douglas et al., 2020). On the other hand, reports show that Peruvian university students show high levels of anxiety and depression (Farfán-Latorre et al., 2023), which justify the need to demonstrate the factors that contribute to improving life satisfaction.

Concerning life satisfaction, a study reported that 65.6% of university students show a risk of suffering from some mental health disorder; however, the higher the students' perception of health, happiness, and life satisfaction, the lower the risk of suffering from some disorder (Rodríguez-Rodríguez et al., 2022). Likewise, other studies directly related mental health and the perception of life satisfaction (Muñoz-Albarracín et al., 2023), trait emotional intelligence, and life satisfaction, regardless of the student's cultural context (Cejudo et al., 2023) and that social support is the best predictor of life satisfaction (Arroyo-Sibaja, 2023). These conditions show the need for and relevance of carrying out the study on life satisfaction and its associated predictors among Peruvian university students. This need must be answered by analyzing factors such as academic burnout and family communication that act as predictors of life satisfaction among university students. Faced with this, the objective of the research was to determine if academic burnout and family communication predict life satisfaction in Peruvian university students.

2 Method

2.1 Design

A cross-sectional study with a predictive design was carried out. The research used statistical analysis to identify predictors of life satisfaction (Ato et al., 2013).

2.2 Sample

Through non-probabilistic convenience sampling (Ñaupas et al., 2014), 787 university students participated voluntarily, of which 78 contained atypical data or data that seemed unrealistic, so they were excluded, and a sample of 708 participants over 18 from private and public universities. Due to accessibility problems, it was not possible to form a representative sample by region of the country. Therefore, non-probabilistic intentional sampling was used.

2.3 Procedure

Approval for data collection was obtained from the Ethics Committee of the Postgraduate School of the Universidad Peruana Unión. The Google Forms virtual survey format was used, which already contained informed consent at the beginning and was shared with the university students through social networks such as WhatsApp and Messenger. Likewise, the research objective, rights, and benefits were communicated to the participants. The data was collected for 2 weeks and 6 days, from December 12, 2023, to January 8, 2024. The study was promoted through social media and emails sent to participating students. Only those students who voluntarily agreed and provided consent through the informed consent form completed the questionnaire.

2.4 Instruments

The Maslach Burnout Inventory (MBI) was used for the academic burnout variable, initially proposed by Maslach and Jackson (1981). For this research, the version validated in Peru was used (Correa-López et al., 2019). It presents 15 items in 3 factors (emotional exhaustion, cynicism, and academic effectiveness) with seven Likert-type response options (never, rarely, sometimes, regularly, often, frequently, and always). The questionnaire proves to be valid (KMO = 0.81, Bartlett Test $p < 0.00$) and reliable ($\alpha = 0.79$).

For Family Communication, the Family Communication Scale (FCS) was used, initially proposed by Barnes and Olson (1982). For this study, the version validated in Peru was used (Copez-Lonzoy et al., 2016). It presents 10 Likert-type items of five alternatives, with ratings of 1 (extremely dissatisfied), 2 (generally dissatisfied), 3 (undecided), 4 (generally satisfied), and 5 (extremely satisfied), with a maximum possible score of 50 and a minimum of 10. The questionnaire proves to be validated (KMO = 0.895, Bartlett's Test $p < 0.001$) and reliable ($\alpha = 0.938$).

For the Life Satisfaction variable, the Satisfaction with Life Scale (SWLS) was initially proposed by Diener et al. (1985), and the one

used for the research is the version adapted in Peru (Arias-Chavez et al., 2022). The instrument consists of 5 items with seven nominal alternatives, ranging from strongly disagree to agree strongly. The questionnaire proves to be validated (KMO = 0.880, Bartlett's Test $p = 0.00$ less than $p < 0.05$) and reliable ($\alpha = 0.91$).

2.5 Data analysis

The information was analyzed using the statistical program SPSS version 26.0. The following metrics were applied at the descriptive level: mean, SD (standard deviation), skewness coefficient, and kurtosis. At the inferential level of explanation, structural equation modeling was developed with the Robust Maximum Likelihood Estimator.

3 Results

Table 1 presents the sociodemographic data. The mean age obtained was 22.07 years, and the standard deviation was 9.42, denoting the dispersion of ages concerning the mean. Regarding distribution by sex, the participants are composed relatively equally of women and men. The female sex represents 52.26% of the sample, with 370 participants, while the male sex comprises 47.74%, counting 338 individuals.

Table 2 reveals significant patterns in the participation of university students in the study. Among these, the Universidad Peruana Unión stands out and leads with a notable frequency of 192 cases, representing 27.12% of the total. They are followed by the Universidad Peruana Los Andes (15.96%) and the Universidad Nacional del Centro del Perú (9.89%). These figures suggest considerable variability in interest and adoption of the study topic across institutions. University management also emerges as an influential factor, with 62.43% of university students coming from private universities and 37.57% from public universities.

Table 3 offers a detailed analysis of the variables and dimensions studied. Firstly, the academic burnout reveals a mean of 34.56 and a standard deviation of 13.26, indicating substantial variability in the participants' responses. Skewness near zero (−0.17) suggests a relatively symmetric distribution, while slightly positive kurtosis (0.06) indicates that the data distribution is flatter than a standard normal distribution. Delving deeper into the dimensions of academic burnout, distinctive patterns are identified. Emotional Exhaustion, with a mean of 12.21 and a standard deviation of 6.33, shows a positive asymmetry (0.70) and a positive kurtosis (0.11), indicating a particular inclination toward higher responses in this dimension. On the other hand, the Cynicism dimension, with a

TABLE 1 Sociodemographic data.

Variable	f	%
Age ($M=22.07$; $SD=9.42$)		
Sex		
Female	370	52.26
Male	338	47.74

M, mean; SD, standard deviation.

TABLE 2 Frequency by university and university management.

Variable	f	%
University Name		
Pontificia Universidad Católica del Perú	4	0.56
Universidad Andina Néstor Cáceres Velásquez	1	0.14
Universidad Autónoma de Ica	11	1.55
Universidad Católica de Santa María	1	0.14
Universidad Católica San Pablo	1	0.14
Universidad César Vallejo	23	3.25
Universidad Continental	53	7.49
Universidad del Pacífico	1	0.14
Universidad Nacional Autónoma de Tayacaja	6	0.85
Universidad Nacional Daniel Alcides Carrión	8	1.13
Universidad Nacional de Ingeniería	9	1.27
Universidad Nacional de Juliaca	88	12.43
Universidad Nacional del Altiplano	18	2.54
Universidad Nacional del Centro del Perú	70	9.89
Universidad Federico Villarreal	5	0.71
Universidad Nacional Jorge Basadre Grohmann	52	7.34
Universidad Nacional José María Arguedas	1	0.14
Universidad Nacional Mayor de San Marcos	1	0.14
Universidad Nacional Micaela Bastidas	4	0.56
Universidad Nacional Pedro Ruiz Gallo	1	0.14
Universidad Nacional Tecnológica de Lima Sur	3	0.42
Universidad Peruana Cayetano Heredia	2	0.28
Universidad Peruana de Ciencias Aplicadas	3	0.42
Universidad Peruana Los Andes	113	15.96
Universidad Peruana Unión	192	27.12
Universidad Privada de Tacna	2	0.28
Universidad Privada Franklin Roosevelt	5	0.71
Universidad San Ignacio de Loyola	4	0.56
Universidad Tecnológica de los Andes	1	0.14
Universidad Tecnológica del Perú	25	3.53
University Management		
Private	442	62.43
Public	266	37.57

TABLE 3 Descriptive analysis of the study variables.

Variables	Mean	SD	g^1	g^2
Academic burnout	34.56	13.26	-0.17	0.06
Emotional exhaustion	12.21	6.33	0.70	0.11
Cynicism	7.33	5.41	0.74	0.06
Academic effectiveness	15.02	8.27	0.18	-0.71
Family communication	34.83	8.90	-0.81	0.25
Life satisfaction	23.31	7.24	-0.54	-0.52

SD, standard deviation; g^1 , asymmetry; g^2 , kurtosis.

TABLE 4 Correlations between variables and reliability.

Variable	AB	AE	CI	FE	FC	LS	α	ω
AB	1						0.87	0.92
EE	0.70**	1					0.91	0.93
CI	0.76**	0.71**	1				0.86	0.87
AE	0.58**	-0.11**	0.02	1			0.90	0.92
FC	-0.30**	-0.03	-0.10*	-0.40**	1		0.95	0.95
LS	-0.49**	-0.18**	-0.23**	-0.49**	0.54**	1	0.91	0.93

* $p < 0.05$, ** $p < 0.01$; AB, academic burnout; EE, emotional exhaustion; CI, cynicism; AE, academic effectiveness; FC, family communication; LS, life satisfaction.

TABLE 5 Structural equation model fit indices.

Model	χ^2	gl	p	CFI	TLI	RMSEA	SRMR
Influence model	10954.19	399	0.000	0.95	0.94	0.19	0.14

TABLE 6 Influence model regressions.

Regression	Estimate	Standard Error	p	β
Academic burnout – Life satisfaction	-0.849	0.058	0.000	-0.469
Family communication – Life satisfaction	0.436	0.034	0.00	0.420

mean of 7.33 and a standard deviation of 5.41, exhibits a positive skewness (0.74) and a kurtosis close to zero (0.06), indicating a less skewed distribution and closer to a normal distribution. Regarding Academic Efficacy, with a mean of 15.02 and a standard deviation of 8.27, it stands out for its positive asymmetry (0.18) and a negative kurtosis (-0.71), suggesting a concentration of responses toward lower values in this dimension. These dimensional results provide a more complete understanding of the academic burnout experience in its different facets.

Family Communication, with a mean of 34.83 and a standard deviation of 8.90, shows a negative skewness (-0.81) and a positive kurtosis (0.25), indicating a distribution skewed to the left and a specific concentration of responses. Finally, Life Satisfaction, with a mean of 23.31 and a standard deviation of 7.24, presents negative skewness (-0.54) and negative kurtosis (-0.52), suggesting a distribution skewed to the left and a wider dispersion of responses.

Table 4 presents a detailed analysis of the correlations between the study variables and the reliability measures of the scales used. We begin by examining the correlations. By analyzing the correlations, it is observed that academic burnout (AB) shows a significant positive correlation with Emotional Exhaustion (EE) ($r = 0.70$, $p < 0.01$) and Cynicism (CI) ($r = 0.76$, $p < 0.01$), and a significant negative correlation with Academic Efficacy (AE) ($r = -0.58$, $p < 0.01$). These findings suggest that as academic burnout increases, it is related to higher levels of emotional exhaustion and cynicism and a decrease in the perception of academic efficacy.

Family Communication (FC) exhibits significant negative correlations with academic burnout ($r = -0.30$, $p < 0.01$) and Life Satisfaction (LS) ($r = -0.49$, $p < 0.01$), suggesting that less family communication Effectiveness is associated with higher levels of academic burnout and lower life satisfaction.

Regarding reliability, the alpha (α) and omega (ω) coefficients indicate robust internal consistency for all variables, ranging between

0.86 and 0.95. These values suggest that the measures used are reliable and consistent in evaluating the studied constructs.

Table 5 details the fit indices of the structural equation model used in our research, critically evaluating the model's goodness of fit and effectiveness in representing the relationships between the observed variables. The chi-square (χ^2) value is significant ($p < 0.001$), indicating a discrepancy between the model and the observed data. However, we examine other indicators since this index may be sensitive to large sample sizes. The Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI) yield values of 0.95 and 0.94, respectively, suggesting a good model fit compared to a null model. These indices support the model's explanation of the proposed relationships between the variables.

The Root Mean Square Error of Approximation (RMSEA), although showing a value of 0.19, above the traditional threshold of 0.08, suggests a moderate fit. The Standardized Root Mean Square Residual (SRMR) with a value of 0.14 also supports the model as a good fit.

Table 6 presents the specific regressions of the influence model, providing a quantitative assessment of the relationships between the key variables in our study. Firstly, the relationship between academic burnout and Life Satisfaction reveals a significant estimate of -0.849 ($p < 0.001$), with a beta coefficient (β) of -0.469. These results conclusively suggest a negative relationship between academic burnout and Life Satisfaction, indicating that an increase in academic burnout is associated with a decrease in overall life satisfaction. Second, the regression examining the relationship between Family Communication and Life Satisfaction shows a significant positive estimate of 0.436 ($p < 0.001$), with a beta coefficient (β) of 0.420. These findings strongly confirm that quality family communication is positively related to life satisfaction, implying that a communicative and effective family environment contributes to higher levels of general well-being (Figure 1).

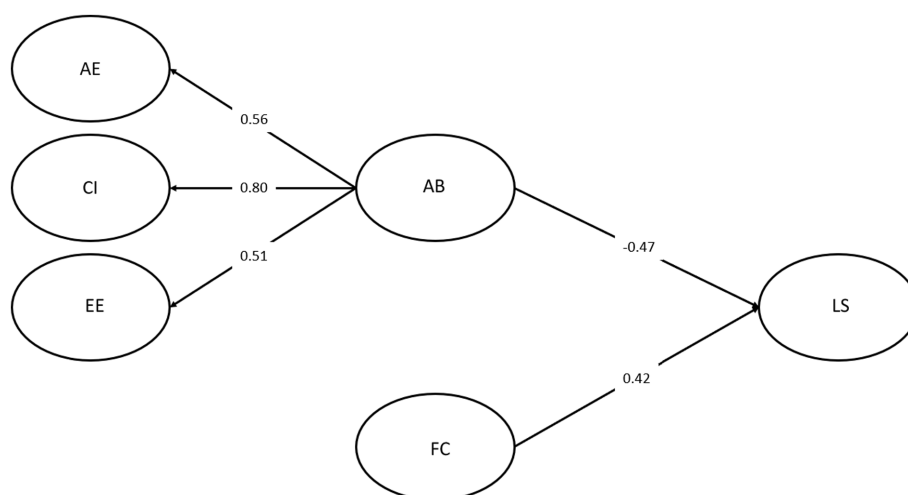


FIGURE 1

Influence model with SEM. AB, academic burnout; EE, emotional exhaustion; CI, cynicism; AE, academic effectiveness; FC, family communication; LS, life satisfaction.

4 Discussion

Life Satisfaction is a significant element of well-being because it aims to value the quality of life holistically, considering the subject's criteria (Pavot and Diener, 1993), which positively impacts physical and mental health, enriches interpersonal and intrapersonal relationships, and strengthens the ability to achieve goals (Novoa and Barra, 2015). Furthermore, its investigation of university students is relevant because it is a stage of challenges toward new demands, which influence their perception and how they are evaluated (Ruiz-González et al., 2018). Faced with this, the research objective was to determine whether academic burnout and family communication predict life satisfaction in Peruvian university students.

The results obtained in our research show a negative relationship between academic burnout and life satisfaction in Peruvian university students. This result is consistent with what was reported by a study carried out with German university students, in which they reported that all symptoms of academic fatigue showed a significant negative correlation with life satisfaction (Turhan et al., 2022). Another similar result reported that academic burnout among Chinese medical school undergraduates is a negative predictor of life satisfaction (Wang et al., 2022). This indicates that our findings confirmed and validated the predictive power of AB in LS. Therefore, it is inferred that while students present an increase in the levels of academic burnout during the university stage, the tendency will be to present a decrease in the levels of life satisfaction.

On the other hand, it is confirmed that family communication is a predictor of life satisfaction in Peruvian university students. This result is consistent with research conducted with American college students, where supportive communication from parents was reported to improve life satisfaction for both emerging college students and non-emerging undergraduate university students, specifying that the association between the variables

prevails more in academically outstanding students (Jeong et al., 2023). Similarly, a mediation model showed that the quality of family communication positively predicted life satisfaction of Chinese university students (Bi and Wang, 2021). This implies that when university students maintain effective communication with their family members, general life satisfaction also rises, which could lead to better coping with the challenges involved in university life and life itself.

The results obtained can be explained based on the theory of self-determination, which considers that social factors and the context where people live contribute to the satisfaction or not of individuals' basic psychological needs about autonomy, competence, and bonding. Therefore, they can strengthen or diminish their motivations and life satisfaction (Deci and Ryan, 1985). This implies that developing the capacity for autonomy, maintaining good intrapersonal and interpersonal relationships, and perceiving themselves as competent will contribute positively to the student's development.

Under the self-determination model, academic burnout is negatively associated with academic satisfaction because it compromises the student's needs for competence and autonomy (Wang et al., 2024). Students who experience academic burnout feel that they are not achieving their academic goals, which decreases their sense of competence (Shih, 2015). Furthermore, the stress and pressure associated with academic burnout reduce the perception of autonomy that students have over their academic life, which in turn reduces their overall satisfaction (Hsu, 2013). Likewise, family communication could satisfy students' need for relationships, which is a central component of well-being according to self-determination theory (Segrin et al., 2022). Furthermore, communication is important within the family by allowing members to share their concerns and needs (Tam et al., 2021). Reports confirm that students who reported high levels of family communication showed low levels of anxiety symptoms, while the severity of anxiety increased with a decrease in family communication (Jetishi-Çollaku et al., 2024).

Also, the theory of well-being or the Perma model proposed within positive psychology contributes to understanding how sustainable and comprehensive well-being can be achieved, considering five essential elements as positive emotions, commitment, positive relationships, purpose, and finally achievements (González-Moreno and Molero-Jurado, 2022; Seligman, 2011). In that sense, developing each component can help increase general satisfaction and motivation levels. Likewise, it is important to highlight that open and effective family communication plays an essential role in satisfying the basic needs of students' psychological well-being (Cudris-Torres et al., 2020; Garcés Coca and Mejía Rubio, 2023).

Academic burnout affects several elements of the Perma model, decreasing positive emotions, reducing commitment to academic activities and leading to a lower sense of achievement (Schaufeli et al., 2002). These factors are related to the increase or decrease in general satisfaction with life (Bi and Wang, 2021). Likewise, family communication plays an important role in the positive relationships of the PERMA model, because when students maintain strong family communication they are more likely to have healthy relationships, and life satisfaction is improved (KavehFarsani et al., 2020).

Furthermore, this study's importance and results allow us to know that academic burnout and family communication predict the life satisfaction of Peruvian university students. Therefore, from a practical perspective, it would be important to implement extracurricular activities, such as promoting healthy study habits and strengthening effective family communication routines in students, to reduce the magnitude of academic burnout and increase life satisfaction.

4.1 Implications

The findings of this study have significant implications for both practice and future research on college students. First, measures should be taken to reduce students' academic burnout, as it can have detrimental effects on life satisfaction. It is suggested that educational institutions implement plans in which academic burnout can be better controlled. Through mentoring and student well-being programs, the implementation of strategies that help identify and control student academic burnout is recommended. Likewise, family communication should be considered a key factor to improve students' life satisfaction. It is important that educational institutions and policy makers continue to support and improve tutoring programs responsible for reducing levels of academic burnout. This includes awareness campaigns about the dangers of academic burnout that address misconceptions and encourage a clear understanding of the associated risks. In the case of students, it is also important that they can change their perspective in such a way that they become actively involved in improving their satisfaction with life and family communication and implement mechanisms that prevent academic burnout.

Concerning the limitations, the type of sampling is important to consider since the sample was obtained through non-probabilistic convenience sampling, which does not invalidate the verification of the structural model tested. However, selecting a sample with a more excellent representation of the Peruvian university population would

be feasible. On the other hand, the research design is cross-sectional, which does not allow us to establish causal relationships between the study variables. However, a longitudinal design may explain the variables' behavior more clearly. Furthermore, all the data used were obtained through self-reports, leaving the possible subjectivity of the participants' responses outside our control, which would put their validity and objectivity at risk.

5 Conclusion

The findings show that academic burnout has a negative relationship with life satisfaction and that family communication shows a positive relationship with life satisfaction. This implies that academic burnout and family communication predict the life satisfaction of Peruvian university students. Our study suggests that university educational institutions establish intervention programs for healthy study habits to reduce academic burnout and strengthen effective family communication routines, raising life satisfaction. For higher education, this study recommends implementing educational programs that improve students' ability to recognize and address academic burnout, as well as advocating for policies that promote better student family communication and thus raise levels of satisfaction with life.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Comité de Ética de la Escuela de Posgrado de la Universidad Peruana Unión. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

JG: Conceptualization, Investigation, Methodology, Validation, Writing – original draft, Writing – review & editing. RB: Investigation, Methodology, Validation, Writing – original draft. DB: Conceptualization, Formal analysis, Methodology, Writing – review & editing. JT-C: Conceptualization, Investigation, Methodology, Supervision, Writing – original draft, Writing – review & editing. IC: Data curation, Formal analysis, Funding acquisition, Resources, Validation, Visualization, Writing – review & editing.

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Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/feduc.2024.1408240/full#supplementary-material>

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