

MEDIATING ROLE OF PSYCHOLOGICAL CAPITAL BETWEEN ACADEMIC STRESS AND HEALTH BEHAVIORS IN UNIVERSITY STUDENTS DURING COVID-19

Jesús Manuel Guerrero-Alcedo¹, Lorena Espina-Romero², Freddy Roberpierre Jaimes-Alvarez¹, John Omar Espinoza-Quiroz¹ and Andrés Mil-Serrano^{1,3}

¹*Southern Scientific University*; ²*San Ignacio de Loyola University*; ³*Toulouse Lautrec Institute (Peru)*

Abstract

The present study aims to establish the mediating role of psychological capital in the relationship between academic stress and the health behaviors of Peruvian university students during the covid-19 pandemic. A non-probability sample of 708 students (548 females and 160 males), aged 18 to 61 years ($M=22.1$, $SD=6.0$), responded online to the Systemic Cognitivist Inventory for the Study of Academic Stress - Second Version of 21 Items, the Psychological Capital Questionnaire and the Lifestyle Questionnaire for Young University Students. The results of the study confirm that the model fits the data adequately, highlighting both the direct effect of academic stress on health behaviors and psychological capital, as well as the effect of psychological capital on health behaviors. It is evident that psychological capital acts as a partially mediating variable in the relationship between academic stress and health behaviors. These findings highlight the role of psychological capital as a mitigating factor for stress and an enhancer of healthy behaviors in university students.

KEY WORDS: *academic stress, health behaviors, psychological capital.*

Resumen

El presente estudio tuvo como objetivo establecer el rol mediador del capital psicológico en la relación entre el estrés académico y las conductas de salud de los estudiantes universitarios peruanos durante la pandemia del covid-19. Una muestra no probabilística de 708 estudiantes (548 mujeres y 160 hombres), de entre 18 y 61 años ($M=22,1$; $DT=6,0$), respondieron *online* al "Inventario SISCO de estrés académico", el "Cuestionario de capital psicológico" y el "Cuestionario de estilos de vida de jóvenes universitarios". Los resultados del estudio confirman que el modelo se ajusta adecuadamente a los datos, destacando tanto el efecto directo del estrés académico sobre las conductas de salud y el capital psicológico, como el efecto del capital psicológico sobre las conductas de salud. Es evidente que el

capital psicológico actúa como variable parcialmente mediadora en la relación entre el estrés académico y las conductas de salud. Estos resultados ponen de relieve el papel del capital psicológico como factor mitigador del estrés y potenciador de las conductas saludables en los estudiantes universitarios.

PALABRAS CLAVE: *estrés académico, conductas de salud, capital psicológico.*

Introduction

By the end of 2019, covid-19 began to spread around the world (Wu et al., 2020), and it was declared a pandemic on March 11, 2020 (WHO, 2020), causing more than 5 million deaths (Johns Hopkins University & Medicine, 2021). Peru experienced a progressive increase in the number of cases since March 2020, which led the national government to impose strict social restrictions to prevent its spread (Ministry of Health, 2020). In this regard, many educational institutions and universities in the country transitioned to online teaching, and their cultural, sports, and leisure facilities had to close their doors. Furthermore, traditional teaching and learning methods had to adapt to the new virtual changes (Espina-Romero, 2022).

All this situation is likely to have affected the physical and psychological health of university students, primarily due to high levels of academic stress caused by the shift to virtual education, which was scarcely used or unknown to most students and teachers in Peruvian universities (Tomas and Poroto, 2023). Before the covid-19 pandemic, some studies had reported symptoms of academic stress in Peruvian university students at low and moderate levels, ranging from 11.6% to 36.8% (Chávez and Peralta, 2019; Correa-Prieto, 2015; Tasayco, 2019). With the onset of the pandemic, these percentages gradually increased to approximately 47.1%, according to the study by Araoz et al. (2021). Other studies in the context of the pandemic reported percentages ranging from 55.8% (Cassaretto et al., 2021) to 97.3% (Allende et al., 2022) of students experiencing some level of academic stress, with the most predominant stressors being assessments, the perception of academic overload, and time limitations for completing academic tasks. Similarly, the most common symptoms reported by students were drowsiness, eating problems, and changes in eating routines. Finally, assertiveness skills and the development of a plan for carrying out academic activities were the most used management strategies to cope with stress (Cassaretto et al., 2021).

Academic stress, according to the cognitive systemic model proposed by Barraza (2006), involves a psychological state in which a variety of stimuli (exams, workload, grades, teaching methodology, among others) generate a systemic imbalance (physical, cognitive, and behavioral reactions). Students evaluate the situation and must confront it through various strategies to restore the balance disrupted.

In the international scientific literature, the consequences of academic stress and burnout on the health of university populations are described (Clabaugh et al., 2021; Fischer et al., 2016; Opoku-Acheampong et al., 2017; Pacic-Turk and Pavlović, 2020; Son et al., 2020). These effects may intensify during unexpected external events like the covid-19 pandemic due to lack of control, unpredictability, fear of

contagion, decreased interpersonal interactions, and perceptions of loneliness associated with social isolation (Mosanya, 2020). Additionally, in the national scientific literature, abrupt changes resulting from virtual education on the mental health of students are reported (Lovon and Cisneros, 2020).

Very little is known about the repercussions of academic stress on the health behaviors of Peruvian university students, and even less about the mediating role of psychological capital in this relationship. Some studies have shown that academic tasks, presentations, seeking help from teachers (Palomino and Nuñez, 2020), interpersonal relationships, emotional and cognitive reactions (Soto et al., 2020), internet connectivity issues, the teacher's virtual platform management, and learning organization (Lovon and Cisneros, 2020) were stressful factors that led to health symptoms such as headaches, fatigue, lack of energy, sleep disturbances, heightened sensitivity, anxiety, loss of control, worry, fears, and demotivation (Apaza et al., 2021).

In addition to the challenges mentioned earlier, the covid-19 pandemic also had a significant impact on scientific outreach and interdisciplinary collaboration in scientific research. Recent studies by Espina-Romero (2023b) shed light on how scientific outreach evolved in the post-pandemic context, emphasizing the importance of effectively communicating scientific information to society. Likewise, Espina-Romero's research (2023a) has underscored the need to promote collaboration and synergy among different scientific disciplines to address current challenges. These findings highlight the significance of our own research, which focuses on understanding how academic stress during the covid-19 pandemic can affect the health and behavior of university students, and how psychological capital can play a crucial mediating role in this relationship. Considering these perspectives, we can move towards more effective strategies to support our student community during these times of change and challenge.

In this context, a study conducted by Giuntella et al. (2021) using longitudinal data from students at a US university, before and during the covid-19 pandemic, found significant changes in behaviors such as physical activity, sleep, and time usage, with significant implications for mental health, including an increase in depressive symptoms. Likewise, Moriarty et al. (2021) reported a significant reduction in physical exercise and sleep habits, which were associated with students' stress levels. Gadi et al. (2022) mentioned that, due to this context, 51.5% of students made significant changes to their diet, a similar percentage reported changes in appetite (51.1%), while 45.5% engaged in less physical exercise, and 66.5% experienced changes in their sleep patterns.

The situation facing university students requires special attention because this population is in the transition phase between university and entering the job market; thus, they constitute a critical and important social resource (Guldager et al., 2021). Therefore, university institutions should feel an ethical responsibility to assess and address the signs of stress experienced by students and their health habits, especially during times of difficulty, by proposing approaches that reduce the negative impact on the health of those who are part of the academic community (O'Byrne et al., 2021).

The development of personal resources like psychological capital is necessary (Kim and Kweon, 2020) as it allows students to achieve goals and enhance their performance, giving a positive meaning to situations that enables them to adequately address internal and external demands of the context, promoting positive development in the face of these demands and improving their living conditions and adaptation, even in times of significant change (Salanova, 2008).

In the academic context, psychological capital is understood as an optimal state in which students can develop self-confidence in their own abilities (self-efficacy), persist in achieving academic goals or redirect them if necessary (hope), make positive attributions about current or future academic events (optimism), and recover from adverse situations and grow personally (resilience) to achieve academic success and improve their health status (González et al., 2017; Luthan et al., 2007; Martínez et al., 2021). This resource allows students greater cognitive openness, the ability to seek creative solutions to difficulties, and the enhancement of their capacity to cope with problems and challenges, which will directly and indirectly impact academic indicators and their health behaviors (González et al., 2017; Martínez et al., 2021). Research has reported that psychological capital is an excellent predictor of health behaviors in university students (González et al., 2017), especially when combined in a meditational model with other variables such as coping self-efficacy, which has the potential to increase health-protective behaviors (Maykrantz et al., 2021). Likewise, psychological capital has shown its protective effect against psychological stress (stress and psychological distress) and academic performance (Yumin et al., 2018).

This study aims to establish the mediating role of psychological capital between academic stress and health behaviors in students at a Peruvian university during the covid-19 pandemic context. Therefore, we propose the following hypotheses: H1) Academic stress influences health behaviors; H2) Academic stress influences psychological capital; H3) Psychological capital influences health behaviors; and H4) Psychological capital mediates the relationship between academic stress and health behaviors.

Method

Participants

A total of 708 students participated (548 females and 160 males), from various professional programs from a university center in the city of Lima, Peru, with ages ranging from 17 to 61 years ($M= 22.1$, $SD= 6.0$). The distribution by academic level was as follows: 121 (17%) were in their first to third academic cycle, 347 (49%) were in their fourth to sixth cycle, and 240 (34%) were in their seventh to tenth cycle.

In the Peruvian university system, undergraduate studies are organized into ten academic cycles, spread over five years. Each cycle is equivalent to a semester, and students' progress through these cycles as they complete the required courses. The first cycles (1 to 3) typically focus on general and basic subjects, while the intermediate cycles (4 to 6) are centered on more specialized subjects within the

field of study. The final cycles (7 to 10) are primarily dedicated to advanced courses, research projects, or professional internships, preparing students for entry into the job market. This structure differs from other countries, where the academic organization can vary significantly in terms of the duration and content of studies.

Instruments

- a) *Systemic Cognitivist Inventory for the Study of Academic Stress - Second Version of 21 Items* ("Inventario SIStémico COgnoscitivista para el estudio del estrés académico. Segunda versión de 21 ítems", SISCO-SV-21; Barraza, 2018). This scale has originally been validated in multiple Latin American countries and has been used in various research studies in Peru in its different versions (Alania et al., 2020; Olivas-Ugarte et al., 2021). In this study, the adapted version for assessed academic stress consisting of 21 items and three dimensions was utilized: stressors, symptoms, and coping strategies. The response scale ranges from 0 (Never) to 5 (Always). McDonald's omega coefficient values were acceptable for the stressors' dimension ($\omega = .87$), symptoms dimension ($\omega = .88$), and coping strategies dimension ($\omega = .87$). For construct validity confirmation, a CFA was conducted with the following results: $\chi^2/df = 4.95$, TLI = .981, CFI = .983, RMSEA = .075, SRMR = .046, GFI = .996.
- b) *Psychological Capital Questionnaire* (PCQ-12; Luthans et al., 2007), adapted version for the academic context by Martínez et al. (2021). This scale consisted of 12 items and 4 dimensions: self-efficacy, hope, resilience, and optimism. It has a six-point response scale ranging from 1 (Completely Disagree) to 6 (Completely Agree). This scale has shown adequate indicators of cultural stability (Martínez et al., 2021). The McDonald's omega value for this study were acceptable in the dimensions of self-efficacy ($\omega = .92$), hope ($\omega = .91$), resilience ($\omega = .84$), and optimism ($\omega = .91$). The conducted CFA yielded the following results: $\chi^2/df = 2.96$, TLI = .998, CFI = .999, RMSEA = .053, SRMR = .024, GFI = .999.
- c) *Lifestyle Questionnaire for Young University Students* ("Cuestionario de estilos de vida de jóvenes universitarios", CEVJU-R; Salazar et al., 2010), revised version (CEVJU r) for Lima students by Chau and Saravia (2016). This questionnaire for Lima consisted of 30 items and six dimensions: "Physical fitness and sports, organization of rest or leisure time, self-care and medical care, eating habits, drug consumption control, and sleep organization." It has a four-option response scale ranging from 0 (Never) to 3 (Always). McDonald's omega values for this study were acceptable in the dimensions of physical fitness and sports ($\omega = .76$), organization of rest and leisure time ($\omega = .73$), self-care and medical care ($\omega = .81$), eating habits ($\omega = .77$), drug consumption control ($\omega = .79$), and sleep organization ($\omega = .63$). The CFA analysis yielded the following results: $\chi^2/df = 1.50$, TLI = .955, CFI = .960, RMSEA = .027, SRMR = .059, GFI = .988.

Procedure

To carry out this research, coordination was established with directors from various faculties and professional programs at a higher education institution in Metropolitan Lima. The purpose of this coordination was to formally request the necessary permissions for administering the battery of instruments to the students. The administration of the instrument battery was done individually through virtual means in a single session. Prior to participation, students were required to provide informed consent. The instruments were presented in the following order: informed consent, personal data sheet, SISCO-SV-21, CEVJU r and PCQ. The online instrument battery was designed using Google Forms®. Students were instructed to respond to the instruments honestly. Subsequently, the instrument data was transferred to Excel® and corrected in accordance with the authors' instructions. The data obtained was then analyzed and presented with corresponding statistics, utilizing tables and figures. These findings were subsequently discussed in relation to literature, leading to plausible conclusions.

This is a quantitative cross-sectional study and was carried out from June to September 2022, following strictly adhered to the ethical guidelines proposed in international declarations for studies involving humans, in accordance with the Declaration of Helsinki, as well as the Code of Ethics and Deontology of the College of Psychologists of Peru. Informed consent was obtained from all participants. The study protocol and informed consent were reviewed and approved by the institutional research ethics committee of the Southern Scientific University, under record number 089-CIE-CIENTIFICA-2022.

Data analysis

The analysis of the collected data was conducted in accordance with the use of the lavaan package (Rosseel, 2012) in R Statistical Software version 4.0.5 (R Development Core Team, 2007). The theoretical model of the present study was subjected to analysis using structural equation modeling with the maximum likelihood robust estimator (MLR), which is the most appropriate for continuous variables and efficient in the face of multivariate non-normality (Muthen and Muthen, 2017). To assess the fit, the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root means square error of approximation (RMSEA), and the standardized root mean square residual (SRMR) were used. Acceptable values for CFI and TLI were $> .90$, while RMSEA and SRMR were $< .08$ (Hu and Bentler, 1999). Additionally, indirect effects were obtained using the bootstrapping technique (5000 repetitions), and confidence intervals were estimated to determine the indirect effect, with an expectation that its value does not pass through zero, thus assuming its significance, i.e., less than 0.05 (Shrout and Bolger, 2002). As for the reliability analysis, the internal consistency method with omega coefficient (ω) was used, which performs better compared to the limitations reported for the alpha coefficient (Cho, 2016; Sijtsma, 2009).

Results

Descriptive statistics and correlational analysis

The results indicate that university students present a moderate level of stressors, symptoms, and coping, as well as psychological capital. While health behaviors are at a low level. Stressors correlate positively with symptoms and negatively correlated with coping, psychological capital, and health behaviors. Symptoms correlate negatively with coping, psychological capital, and health behaviors. Finally, psychological capital correlates positively with health behaviors. All measurements have values of Mc Donald's Omegas greater than .75 (Table 1).

Table 1
Descriptive statistics, correlation and reliability

Variables	Range	M	SD	Asymmetry	Kurtosis	1	2	3	4	5
1. Stressors	0 - 35	22.8	6.3	-0.56	0.63	(.86)				
2. Symptoms	1 - 35	21.9	7.3	-0.30	-0.37	0.570**	(.88)			
3. Coping	0 - 35	22.4	6.5	-0.57	0.22	-0.102**	-0.223**	(.87)		
4. Psychological capital	12 - 72	48.4	14.1	-0.46	-0.53	-0.323**	-0.433**	0.476**	(.95)	
5. Health Behaviors	10 - 63	29.4	8.7	0.66	0.73	-0.135**	-0.200**	0.204**	0.297**	(.77)

Note: ** $p < .01$.

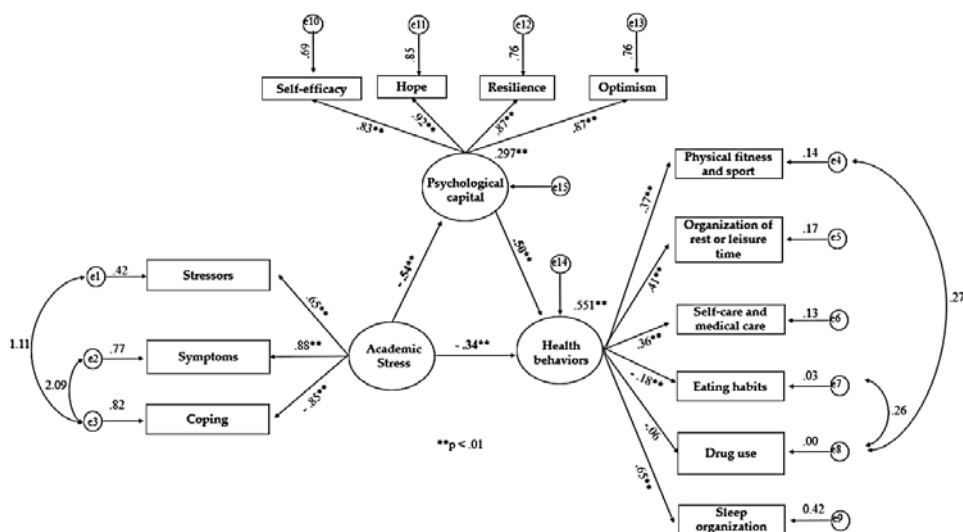
Hypothesis testing

Initially, an analysis was conducted using the robust maximum likelihood method (MLM), which resulted in an inadequate fit of the model data ($\chi^2 = 467$, $df = 62$; $p < .001$, TLI = .856; CFI = .886; SRMR = .079; RMSEA = .096, 95% CI [.088, .104]). A modification of the model was performed, identifying correlated errors between stressors, symptoms, and coping, as well as between drug use, physical condition/sport, and eating habits, which were supported in accordance with scientific literature. The analysis demonstrated that the theoretical model had an adequate fit to the data, with the following goodness-of-fit criteria: $\chi^2 = 226$, $df = 58$, $p < .001$, TLI = .936, CFI = .953, SRMR = .043, RMSEA = .064, 95% CI [.055, .073], with these values being appropriate. Furthermore, the results confirm that academic stress has a direct, negative, and significant influence on health behaviors ($\beta = -.340$; $p < .01$) and psychological capital ($\beta = -.545$; $p < .01$). Psychological capital has a direct, positive, and significant influence on health behaviors ($\beta = .501$; $p < .01$). These findings confirm hypotheses 1, 2, and 3. Table 2 presents the indirect effect of academic stress on health behaviors, in the presence of psychological capital, revealing a negative and significant effect ($\beta = -.34$; $z = -5.737$; $p < .01$) (Figure 1).

Table 2
Indirect effect analysis

Indirect effect	B	S.E.	95% CI		β	z	p
			LL	UL			
Academic stress → Psychological capital → Health behaviors	-0.061	0.010	-0.081	-0.041	-.273	-5.974	<.001

Figure 1
Resulting structural model (N= 708)



Note: ** p < .01.

Discussion

This study aimed to empirically verify the mediating role of psychological capital in the relationship between academic stress and health-related behaviors of students at a private higher education center located in Metropolitan Lima. The results are discussed below as reported in the literature.

The study confirms that academic stress has a significant negative impact on health behaviors among college students, where lower stress perception and better coping strategies are linked to healthier behaviors. Kim and Brown (2018) emphasize that perceived stress significantly affects unhealthy behaviors, particularly in college students who are at high risk due to their transitional phase into adulthood. Supporting this, Doak et al. (2022) and other studies highlight associations between high academic stress and poor dietary habits, decreased physical activity, and sleep quality.

The covid-19 pandemic exacerbated these issues, as Chen and Lucock (2022) report that pandemic-induced stress increased mental health risks, affecting students' academic success and personal lives. Pierre et al. (2021) observed both positive and negative changes in health behaviors during the pandemic, with significant concerns about physical activity and stress. Suksatan et al. (2021) further show that adversity and stress during the pandemic impacted Thai students' health behaviors, emphasizing the importance of coping skills.

In the Peruvian context, pre-pandemic studies by Duran and Mamani (2021) show adequate eating habits but low physical activity levels, which worsened during the pandemic according to Bautista and Rodríguez (2021). This worsening is attributed to increased academic stress, with Allende et al. (2022) confirming that stress significantly predicts poor sleep quality among students.

This study confirms the second research hypothesis by demonstrating that academic stress significantly influences psychological capital. Lower levels of academic stress are associated with fewer symptoms and better coping strategies, leading to higher psychological capital. Riolli et al. (2012) and Luthans et al. (2012) found that psychological capital helps students develop adaptive skills, making stress more manageable. Yumin et al. (2018) highlighted that psychological capital minimizes the negative effects of distress but not eustress, reinforcing the positive aspects of stress. Johnston and Cassidy (2020) further noted that psychological capital, enhanced by humor, buffers the negative impacts of academic stress on well-being. Smith and James (2021) supported these findings, showing that during the pandemic, psychological capital helped mitigate the negative effects of stress, fear of contagion, and social isolation. This body of evidence suggests that psychological capital plays a crucial role in reducing the impact of academic stress, though its effects vary depending on the type of stress encountered.

The results of this study support the third research hypothesis by demonstrating that psychological capital exerts a direct and significant influence on health-related behaviors. This suggests that students who can effectively cope with academic demands, maintain an optimistic outlook, pursue their personal goals, adapt when necessary, and deal with adverse situations while emerging stronger from them will substantially contribute to the development of healthier behaviors.

These findings are confirmed by González et al. (2017), who explored the association between psychological capital resources and health behaviors in Mexican university students. These authors found that all resources associated with psychological capital explained 33.3% of health behaviors. These findings highlight the potential of psychological capital resources, such as psychosocial resources, in promoting the development of healthier habits among university populations.

In contrast to what was reported by previous authors, Maykrantz et al. (2021) in the context of covid-19 found that psychological capital did not turn out to be a significant predictor of health behaviors. However, when incorporated into a serial mediation model, it can enhance the effect along with coping self-efficacy to mediate the relationship between self-leadership and health-protective behaviors.

The results confirm the fourth hypothesis, showing that academic stress indirectly affects health behaviors through the mediation of psychological capital. This partial mediation suggests that psychological capital plays a significant role in

reducing the negative impact of academic stress on health behaviors. Poots and Cassidy (2020) support this by demonstrating how psychological capital, along with self-compassion and social support, mediates the relationship between academic stress and psychological well-being, helping students manage stress and maintain well-being. Avey et al. (2009), Rahimnia et al. (2013), and Riolli et al. (2012) further highlights that psychological capital, through its components of optimism, hope, and resilience, equips students to handle stress effectively, promoting better health behaviors and shifting focus from stress-induced deficits to positive well-being. This enhanced adaptability contributes to academic success and healthier lifestyle choices, as noted by Poots and Cassidy (2020).

The present research work constitutes an important contribution to the fields of education and health, as it is one of the first national and international studies that demonstrates the role of psychological capital as a mediating variable that allows mitigating the effect of academic stress on the health-related behaviors of university students. In the Peruvian context, there is a need for further research to continue deepening our understanding of the influence of positive psychological resources in reducing academic stress. This will have a direct and indirect impact on the extent to which this population group can develop and maintain better health habits that help enhance their physical and psychological well-being, with implications for academic indicators as well.

Furthermore, the findings of this study highlight practical implications that should be considered by students and universities to promote healthier practices for health and effective stress management in this context. Universities, as agents of change whose goal is to educate future professionals in the country, must be attentive to and ensure the well-being of all their members. This implies that they can implement and/or enhance the design of policies and interventions that promote positive psychosocial factors or resources to help students adequately manage the demands of the academic environment and foster better health habits, thus benefiting not only their professional development but also their physical and psychological well-being.

Based on the study's findings, universities could implement psychological support programs focused on developing psychological capital, such as workshops on resilience, optimism, and self-efficacy, to help students more effectively cope with academic stress. Additionally, integrating wellness practices, such as regular physical activity programs and nutritional counseling, into the university curriculum is recommended to promote healthy habits. On an individual level, students could benefit from participating in support or mentoring groups that reinforce positive coping skills and improve their health behaviors.

An important limitation of this study is its correlational and cross-sectional design, which means that we cannot establish causal relationships between the variables studied. Although the findings suggest that psychological capital may be associated with a reduction in stress perception and an improvement in health behaviors, we cannot confidently assert that these effects are causal. It is possible that other unmeasured factors influence this relationship, and future longitudinal or experimental studies would be necessary to confirm the direction and nature of these associations.

Furthermore, the study was limited to considering only students from a single university center in Lima, which prevents the generalization of the results to students from other institutions, especially those from universities in different regions of Peru, who may face different realities. Additionally, the non-probabilistic sampling used in the study did not allow for obtaining a representative sample of students from all faculties of the university center. Moreover, the voluntary nature of participation and the virtual administration of the instruments may have reduced many students' interests in participating in the study. Finally, due to the covid-19 context, it is possible that many students perceived a higher number of stressors, which, when combined with the inherent academic stressors, could have exacerbated stress symptoms and led to changes in health habits during the confinement period, as suggested by various authors in their research.

References

- Alania, R. D., Llancari-Morales, R. A., Rafaele, M., & Dayan, D. I. (2020). Adaptación del Inventario de Estrés Académico SISCO SV al contexto de la crisis por covid-19 [Adaptation of the SISCO SV Academic Stress Inventory to the context of the covid-19 crisis]. *Socialium*, 4(2), 111-130. doi: 10.26490/uncp.sl.2020.4.2.669
- Allende, F. R., Acuña, J. H., Correa, L. E., & De La Cruz, J. A. (2022). Academic stress and sleep quality in times of the covid-19 pandemic in medical students from a university of Peru. *Revista de la Facultad de Medicina*, 70(3), e93475. doi: 10.15446/revfacmed.v70n3.93475
- Apaza, C., Maquera, P., Huanca-Frías, J., Supo-Quispe, L., Távora-Ramos, A., Dextre-Martínez, W., & Saldaña-Acosta, O. (2021). Factores psicosociales en estudiantes universitarios de Loreto, Ancash, Moquegua y Puno durante el confinamiento por el Covid-19, Perú [Comparison of psychosocial factors in university students from Loreto, Ancash, Moquegua and Puno confinement by Covid-19, Peru]. *Cuestiones Políticas*, 39(68), 51-69. doi: 10.46398/cuestpol.3968.02
- Araoz, E. G. E., Uchasara, H. J. M., Araoz, M. C. Z., & Roque, M. M. (2021). Estrés académico en estudiantes universitarios peruanos en tiempos de la pandemia del covid-19. *Archivos Venezolanos de Farmacología y Terapéutica*, 40(1), 88-93.
- Avey, J. B., Luthans, F., & Jensen, S. M. (2009). Psychological capital: A positive resource for combating employee stress and turnover. *Human Resource Management*, 48(5), 677-693. doi: 10.1002/hrm.20294
- Barraza, A. (2006). Un modelo conceptual para el estudio del estrés académico [A conceptual model for the study of academic stress]. *Revista Electrónica de Psicología Iztacala*, 9(3), 110-129.
- Barraza, A. (2018). *Inventario Sisco SV-21. Inventario Sistemico Cognoscitivista para el estudio del estrés académico. Segunda versión de 21 ítems [Sisco SV-21 Inventory. Systemic Cognitive Inventory for the study of academic stress. Second version of 21 items]*. ECORFAN.
- Bautista-Coaquira, M. H., & Rodríguez-Quiroz, M. Z. (2021). Correlación entre el estilo de vida y nivel de estrés en estudiantes de enfermería de una universidad peruana [Correlation between lifestyle and stress level in nursing students at a Peruvian university]. *Revista Peruana de Medicina Integrativa*, 6(4), 102-109. doi: 10.26722/rpmi.2021.v6i4.34
- Cassaretto, M., Vilela, P., & Gamarra, L. (2021). Estrés académico en universitarios peruanos: Importancia de las conductas de salud, características sociodemográficas y académicas

- [Academic stress in Peruvian college students: The importance of health behaviors, and sociodemographic and academic characteristics]. *Liberabit, Revista Peruana de Psicología*, 27(2), e482. doi: 10.24265/liberabit.2021.v27n2.07
- Chau, C., & Saravia, J.C. (2016). Conductas de salud en estudiantes universitarios limeños: validación del CEVJU [Health behaviors in university students from Lima: validation of CEVJU]. *Revista Iberoamericana de Diagnóstico y Evaluación e Avaliação Psicológica*, 41(1), 90-103.
- Chávez Parillo, J. R., & Peralta Gómez, R. Y. (2019). Estrés académico y autoestima en estudiantes de enfermería, Arequipa-Perú [Academic stress and self-esteem in nursing students, Arequipa-Perú]. *Revista de Ciencias Sociales (Ve)*, 25(E1), 384-399. doi: 10.31876/rcs.v25i1.29629
- Chen, T., & Lucock, M. (2022). The mental health of university students during the covid-19 pandemic: An online survey in the UK. *PLoS one*, 17(1), e0262562. doi: 10.1371/journal.pone.0262562
- Cho, E. (2016). Making reliability reliable: A systematic approach to reliability coefficients. *Organizational Research Methods*, 19(4), 651-682. doi: 10.1177/1094428116656239
- Clabaugh, A., Duque, J. F., & Fields, L. J. (2021). academic stress and emotional well-being in United States college students following onset of the covid-19 pandemic. *Frontiers in Psychology*, 12, 628787. doi: 10.3389/fpsyg.2021.628787
- Correa-Prieto, F. R. (2019). Estrés académico en estudiantes de medicina de la Universidad Cesar Vallejo, de Piura 2013 [Academic stress in medical students in the la Universidad Cesar Vallejo, of Piura 2013]. *Revista del Cuerpo Médico Hospital Nacional Almanzor Aguinaga Asenjo*, 8(2), 80-84. doi: 10.35434/rcmhnaaa.2015.82.202
- Doak, S., Kearney, J., McCormack, J., & Keaver, L. (2022). Stress levels of higher education students during covid-19 and their correlation with diet quality and lifestyle behaviours. *Proceedings of the Nutrition Society*, 81(OCE1), E42. doi: 10.1017/S0029665122000428
- Durán-Galdo, R., & Mamani-Urrutia, V. (2021). Hábitos alimentarios, actividad física y su asociación con el estrés académico en estudiantes universitarios de primer año de ciencias de la salud [Eating habits, physical activity and its association with academic stress in firstyear health science university students]. *Revista chilena de nutrición*, 48(3), 389-395. doi: 10.4067/s0717-75182021000300389
- Espina-Romero, L. (2022). Virtual teaching-learning processes during covid-19: A bibliometric review. *Revista de Ciencias Sociales*, 28(3), 345-361. doi: 10.31876/rcs.v28i3.38479
- Espina-Romero, L. C. (2023a). La divulgación científica postpandemia. *Revista Virtual Universidad Católica del Norte*, 68, 1-3. doi: 10.35575/rvucn.n68a1
- Espina Romero, L. (2023b). Colaboración e interdisciplinariedad en la investigación científica: Fomentando la sinergia para abordar los desafíos actuales [Collaboration and interdisciplinarity in scientific research: fostering synergy to address current challenges]. *IPSA Scientia, Revista Científica Multidisciplinaria*, 8(2), 8-9. doi: 10.25214/27114406.1627
- Fischer, S., Nater, U. M., & Laferton, J. A. C. (2016). Negative stress beliefs predict somatic symptoms in students under academic stress. *International Journal of Behavioral Medicine*, 23(6), 746-751. doi: 10.1007/s12529-016-9562-y
- González, J., Oropeza, R., Padrós, F., Colunga, C., Montes, R., & González, V. (2017). Capital psicológico y su relación con el estilo de vida de universitarios mexicanos [Psychological capital and its relationship with lifestyle of Mexican university students]. *Nutrición Hospitalaria*, 34(2), 439-443. doi: 10.20960/nh.172
- Guldager, J. D., Jervelund, S., & Berg-Beckhoff, G. (2021). Academic stress in Danish medical and health science students during the covid-19 lock-down. *Danish Medical Journal*, 68(7), A11200805.

- Hu, L.T., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1-55. doi: 10.1080/10705519909540118
- John Hopkins University & Medicine (2021). *Coronavirus Resource Center*. <https://coronavirus.jhu.edu/>
- Johnston, N., & Cassidy, T. (2020). Academic expectation stress, psychological capital, humour style and student wellbeing. *International Journal of Education*, 8(2). doi: 10.5121/ije.2020.8202
- Kim, S., & Kweon, Y. (2020). Psychological capital mediates the association between job stress and burnout of among Korean psychiatric nurses. *Healthcare*, 8(3), 199. doi: 10.3390/healthcare8030199
- Kim, J., & Brown, S. (2018). The associations between leisure, stress, and health behavior among university students. *American Journal of Health Education*, 49 (6), 375-383. doi: 10.1080/19325037.2018.1516583
- Lovón, M. A., & Cisneros, S. A. (2020). Repercusiones de las clases virtuales en los estudiantes universitarios en el contexto de la cuarentena por covid-19: El caso de la PUCP [Impact of virtual classes on the university students in the context of covid-19 quarantine: The case of the PUCP]. *Propósitos y Representaciones*, 8(SPE3), e588. doi: 10.20511/pyr2020.v8nSPE3.588
- Luthans, F., Youssef, C., & Avolio, B. J. (2007). *Psychological capital: Developing the human competitive edge*. Oxford University Press.
- Luthans, B. C., Luthans, K. W., & Jensen, S. M. (2012). The impact of business school students' psychological capital on academic performance. *Journal of Education for Business*, 87(5), 253-259. doi: 10.1080/08832323.2011.609844
- Luthans, F., Avolio, B. J., Avey, J. B. y Norman, S. M. (2007). Positive psychological capital: Measurement and relationship with performance and satisfaction. *Personnel Psychology*, 60(3), 541-572. doi: 10.1111/j.1744-6570.2007.00083.x
- Martínez, I. M., Meneghel, I., Carmona-Halty, M., & Youssef-Morgan, C. M. (2021). Adaptation and validation to Spanish of the Psychological Capital Questionnaire-12 (PCQ-12) in academic contexts. *Current Psychology*, 40, 3409-3416. doi: 10.1007/s12144-019-00276-z
- Maykrantz, S. A., Langlinais, L. A., Houghton, J. D., & Neck, C. P. (2021). Self-Leadership and Psychological capital as key cognitive resources for shaping health-protective behaviors during the covid-19 pandemic. *Administrative Sciences*, 11(2), 41. doi: 10.3390/admsci11020041
- Mikolajczyk, R. T., El Ansari, W., & Maxwell, A. E. (2009). Food consumption frequency and perceived stress and depressive symptoms among students in three European countries. *Nutrition Journal*, 8, 31. doi: 10.1186/1475-2891-8-31
- Ministerio de Salud (2020). *Decreto supremo que declara en emergencia sanitaria a nivel nacional por el plazo de noventa (90) días calendario y dicta medidas de prevención y control del covid-19* [Supreme Decree declaring a national Sanitary Emergency for a period of ninety (90) calendar days and dictating measures for the prevention and control of COVID-19.]. https://cdn.www.gob.pe/uploads/document/file/605928/DS_008-2020-SA.PDF
- Mosanya M. (2020). Buffering academic stress during the covid-19 pandemic related social isolation: Grit and growth mindset as protective factors against the impact of loneliness. *International Journal of Applied Positive Psychology*, 1-16. doi: 10.1007/s41042-020-00043-7
- Muthen, L., & Muthen, B. (2017). *Mplus user's guide* (8th Ed). Muthén & Muthén.

- O'Byrne, L., Gavin, B., Adamis, D., Lim, Y. X., & McNicholas, F. (2021). Levels of stress in medical students due to covid-19. *Journal of Medical Ethics, 47*(6), 383-388. doi: 10.1136/medethics-2020-107155
- Olivas-Ugarte, L., Morales-Hernández, S., & Solano-Jáuregui, M. (2021). Evidencias psicométricas de Inventario SISCO SV-21 para el estudio del estrés académico en universitarios peruanos [Psychometric evidence of SISCO SV-21 Inventory for the study of academic stress in Peruvian university students]. *Propósitos y Representaciones, 9*(2), e647. doi: 10.20511/pyr2021.v9n2.647
- Opoku-Acheampong, A., Kretchy, I. A., Acheampong, F., Afrane, B. A., Ashong, S., Tamakloe, B., & Nyarko, A. K. (2017). Perceived stress and quality of life of pharmacy students in University of Ghana. *BMC research notes, 10*(1), 115. doi: 10.1186/s13104-017-2439-6
- Pacic-Turk, L., & Pavlović, D. (2020). Perceived stress, coping styles and mindfulness as predictors of students' self-reported health behaviors. *Archives of Psychiatry Research: An International Journal of Psychiatry and Related Sciences, 56*(2), 109-128. doi: 10.20471/dec.2020.56.02.01
- Pierre, M., Wouters, E., Van de Velde, S., Buffel, V., Déchelotte, P., Van Hal, G., & Ladner, J. (2021). The impact of covid-19 lockdown on health behaviors among students of a French university. *International Journal of Environmental Research and Public Health, 18*(8), 4346. doi: 10.3390/ijerph18084346
- Poots, A., & Cassidy, T. (2020). Academic expectation, self-compassion, psychological capital, social support and student wellbeing. *International Journal of Educational Research, 99*, 101506. doi: 10.1016/j.ijer.2019.101506
- R Development Core Team (2007). *R: A language and environment for statistical computing. R foundation for statistical computing.* <http://www.R-project.org>
- Rahimnia, F., Mazidi, A., & Mohammadzadeh, Z. (2013). Emotional mediators of psychological capital on well-being: The role of stress, anxiety, and depression. *Management Science Letters, 3*(3), 913-926. doi: 10.5267/j.msl.2013.01.029
- Riulli, L., Savicki, V., & Richards, J. (2012). Psychological capital as a buffer to student stress. *Psychology, 3*, 1202-1207. doi: 10.4236/psych.2012.312A178.
- Salanova, M. (2008). Organizaciones saludables: Una aproximación desde la psicología positiva [Healthy organizations: A positive psychology approach]. In C. Vásquez, & Hervás, G. (Ed.), *Psicología positiva: Bases científicas del bienestar y la resiliencia* (pp. 403-427). Desclée De Brower.
- Salazar I. C., Varela, M. T., Lema, L., Tamayo, J. A., Duarte, C. y Equipo de investigación CEVJU Colombia (2010). Evaluación de las conductas de salud en jóvenes universitarios. *Revista de Salud Pública, 12*(4), 599-611.
- Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 7*, 422-445. doi: 10.1037/1082-989X.7.4.422
- Sijtsma, K. (2009). On the use, the misuse and the very limited of the Cronbach's alpha. *Psychometrika, 74*(1) 107-120. doi: 10.1007/S11336-008-9101-0
- Smith, A. P., & James, A. (2021). The well-being of students in a welsh secondary school before and after a covid-19 lockdown. *Journal of Education, Society and Behavioural Science, 34*(8), 42-51. doi: 10.9734/jesbs/2021/v34i830350
- Son, C., Hegde, S., Smith, A., Wang, X., & Sasangohar, F. (2020). Effects of covid-19 on college students' mental health in the United States: Interview survey study. *Journal of Medical Internet Research, 22*(9), e21279 doi: 10.2196/21279
- Suksatan, W., Choompunuch, B., Koontalay, A., Posai, V., & Abusafia, A. H. (2021). Predictors of health behaviors among undergraduate students during the covid-19 pandemic: A

- cross-sectional predictive study. *Journal of Multidisciplinary Healthcare*, 14, 727-734. doi: 10.2147/JMDH.S306718
- Tasayco, E.J. (2019). Estrés académico en estudiantes de enfermería del I al VIII ciclo de la Universidad Nacional San Luis Gonzaga, Ica - Perú 2018 [Academic stress in nursing students from I to VIII cycle of the National University San Luis Gonzaga, Ica - Peru 2018]. *Revista Enfermería a la Vanguardia*, 7(2), 29-40. doi: 10.35563/revan.v7i2.203
- Wu, F., Zhao, S., Yu, B., Chen, Y. M., Wang, W., Song, Z. G., Hu, Y., Tao, Z. W., Tian, J. H., Pei, Y. Y., Yuan, M. L., Zhang, Y. L., Dai, F. H., Liu, Y., Wang, Q. M., Zheng, J. J., Xu, L., Holmes, E. C., & Zhang, Y. Z. (2020). A new coronavirus associated with human respiratory disease in China. *Nature*, 579(7798), 265-269. doi: 10.1038/s41586-020-2008-3
- Yumin Chua, R., Lu, Y., & Sang-Ah, M. (2018). Mitigating academic distress: The role of psychological capital in a collectivistic Malaysian university student sample. *The Open Psychology Journal*, 11, 171-183. doi: 10.2174/1874350101811010171

RECEIVED: May 5, 2024

ACCEPTED: August 5, 2024