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Academic stress in undergraduate medical students

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Abstract

Stress is a natural and essential form of protection for the survival of the human species. Students in the university stage of health sciences who are immersed in this condition present low academic performance, will not be able to acquire the necessary medical knowledge and in the future, their medical skills will not be adequately developed. The objective of this work is to analyze the stress profile of medical-surgeon students at the beginning and end of the first semester. A descriptive, cross-sectional and analytical study was followed. The instrument used was the Stress Profile developed by Nowack and applied to 132 medical students of the School of Medicine of the Autonomous University of Tamaulipas in Tampico. The results show that the most affected areas are exercise, rest/sleep, food/nutrition and prevention, type A behavior, and threat minimization. It is concluded that students do not focus on practices to maintain good health during their academic life.

Keywords: stress profile, university students, academic stress, medical students.

Introduction

Nowadays, the word "stress" is very frequently mentioned in the conversations of university professors and students and is used interchangeably to refer to a set of factors that disrupt mental and physical health (Ángeles and Cañas, 2019). As mentioned by the American Psychological Association (APA, 2019: 102), stress "is a reaction to a short-term situation that becomes dangerous when it interferes with the ability to live for a prolonged time". Based on the above, it is understood that stress is an internal response to any external stimulus that produces an action, that is, a psychological, physiological, or emotional response that people generate as a critical response to adapt to both internal and external pressures to survive (Cairo-Martínez et al., 2020).

Entering university life involves various academic challenges that become stressful

experiences that confront university students in situations that increase their levels of stress, depression, and anxiety, as well as nervousness, tension, fatigue, overwhelm, and restlessness (Escobar-Zurita et al., 2018). Homework, evaluations, interviews, and meetings, among others, are activities that university students perform daily throughout the teaching-learning process, but when there is an overload of these, stress is generated as a response of the organism to cope with both personal and academic demands (Silva et al., 2020).

Today, higher education is facing a process of change and adaptation in the way of transmitting knowledge, this is due to the current conditions that are being presented worldwide due to the COVID-19 pandemic, which began to start from December 2019, spreading worldwide in the following months (Basturk, Dancer, and McNally, 2020), directly impacting teachers and students in academic stress. According to UNESCO data (IELSAC, 2020) in the American continent, the confinement began in March 2020 and Mexico was no exception, and this condition affected higher education institutions as they did not have the necessary contingency measures to continue with distance education, affecting students as academic activities were interrupted (Lucio et al., 2020), initiating a process of adaptation and reorganization in daily life, loss of social contact, and isolation.

Under this perspective and to give continuity to the teaching-learning process, it had to adapt to the virtual modality through the implementation of platforms (Gelineau and Dilts, 2021) to reduce the COVID-19 pandemic, so both teachers and students faced this context that generated drastic changes, increasing levels of stress and anxiety (Husky et al., 2020) and in people with diseases impact on the adaptation of their treatments (Khosravani et al., 2021). Derived from the above, the negative psychological consequences that occurred in people around the world led to stress, whose concept is the "set of neuroendocrine, immunological, emotional and behavioral processes and responses to situations that involve a greater adaptation than usual for the organism and/or are perceived by the individual as a threat (Vilca et al., 2022).

Literature review

Continuing with university studies in this way developed in the students a certain level of stress that triggered emotional, cognitive, and physiological problems, in addition to facing the academic stress associated with the change of teaching modality, experiencing fatigue, little interest in studying, nervousness and loss of control, triggering sleep disturbances, irresponsibility and other negative manifestations in the performance of their academic performance and the achievement of their personal and professional aspirations (Vilca et al., 2022).

In addition to the above, family conflicts, few hours of sleep, and poor academic performance generate higher levels of stress, especially in students whose socioeconomic level is low and are the ones with more risk factors that promote sleep deficiency, overweight or academic stress (González, 2020), being necessary to formulate and integrate counseling and stress management programs during learning so that they can face this problem (AlAteeq et al., 2020).

According to Zárate et al. (2017) academic stress: is a state that occurs when the student perceives negatively (distress) the demands of his environment, when those situations he faces during his training process are distressing and he loses control to face them and, sometimes, physical symptoms such as anxiety, fatigue, insomnia and academic expressions such as poor school performance, professional disinterest, absenteeism, and even dropout are manifested (p75).

For Cardona & Caballero (2019), the definition of stress can be described as the perception that the individual has of the environment in a personal way, which he/she considers as threatening by exceeding his/her resources that endanger his/her well-being, this condition can be experienced at any time of life, presenting different stressors in each of them. González (2020) comments that people who are satisfied with their lives have better skills and better control of their environment, so they manage adequate control of stressors, which allows them to generate a successful approach.

Several factors determine stress depending on each person, however, among the most common are those based on personality, self-esteem, and body resistance, being perceived differently according to each person, which leads to individual and subjective responses according to their adaptability. Stress attacks 50% of the population, which makes it a serious mental health problem and a serious generating factor of various pathologies (Ramos et al., 2019).

Stress generates various symptoms that can be physical, psychological, and behavioral; among the physical symptoms are insomnia, fatigue, headache, digestive problems, nail biting, tremors, etc. On the other hand, psychological symptoms are observed through restlessness, sadness, anguish, concentration problems, mental block, forgetfulness, etc., and finally behavioral symptoms such as conflicts, isolation, listlessness, and ingestion of alcoholic beverages or other substances (Cruz et al., 2018).

The American Psychological Association (APA, 2019) classifies stress as acute, the most common among people due to a hectic life and originating in everyday situations, finding among its symptoms: emotional agony, irritability, overexcitement, and digestive problems among others; episodic acute due to an accelerated lifestyle with many demanding responsibilities where the individual maintains an incessant worry. The main symptoms are over-agitation, persistent headaches, migraines, chest pain, hypertension, among others, and finally, chronic stress that originates from exposure to stress after long periods wearing out the body and mind.

From another point of view, there is negative stress, also called distress, and positive eustress. Distress occurs when the responses have not been sufficient about the physical, psychological, and/or biological demands, and the energy provided by the adaptive system is not consumed. In contrast, eustress is generated when the demands are responded to harmoniously, respecting the physiological parameters of the individual (Viteri, 2022). Taking into account the space in which stress occurs since the twentieth century, various investigations were conducted on this phenomenon applied to the environment in which it occurs. Thus, following this pattern, stress generated in an educational context is called academic stress (Daher et al., 2020).

Stressors in the academic environment generate an imbalance in students, causing the manifestation of symptoms, which must be addressed through appropriate strategies to restore their balance (García et al., 2017; Peña et al., 2018). Throughout life, people experience stressful situations, however, when these persist, people's reserves are depleted, triggering a series of problems that affect their activities (Rull et al. 2011). Sánchez (2018), comments that "academic stress is higher in higher education students due to the greater number of academic demands" (p. 29).

Regardless of the career that university students study, all are exposed to present these symptoms; however, in the fields of study that belong to the area of health sciences, they are more frequent due to the characteristics of the educational programs, since the academic demands are of high impact, requiring long hours of preparation and training as well as hours of practice (Avila et al., 2018), which causes factors such as "overwork, lack of time, incompatibility between interpersonal relationships, training obligations, sleep disorders, and sedentary lifestyle, coupled with the fact that most are foreigners and have an inadequate diet, leading to a high prevalence of psychological and physical discomfort among the university population" (Domez et al., 2020).

From the beginning of their training, medical students face a high degree of stress, causing the manifestation of fear, anger, incompetence, frustration, and guilt in most cases as a response to the situations that arise and when they cannot solve them adequately (Travesi-Raygoza et al., 2020). Therefore, students use psychological strategies to overcome and assimilate stress, however, in some cases the consequences are negative, causing problem avoidance, idealization of situations, social isolation, and excessive self-criticism. On the contrary, positive approaches that help reduce stress are the mechanisms they use to cope with problems,

communication, and support from others, as well as the expression of emotions (Delgado et al., 2020).

Among the consequences generated by academic stress are increased heart rate, sweating, muscle tension in arms and legs, shortness of breath, bruxism, sleep disorders, chronic fatigue, headache, as well as digestive problems (Rodríguez-Garza et al., 2014). In the behavioral aspect, low academic performance, isolation, tendency to argue, smoking, alcohol consumption, lack of desire, absenteeism, nervousness, and increased or decreased appetite and sleep stand out (Gutiérrez-Huby and Amador-Murguia, 2016).

This research is important because it will allow knowing the different situations that generate stress among university medical students at the South Campus of the Autonomous University of Tamaulipas. Considering the above, academic stress is one of the factors that most affect the optimal learning of students in this career. Derived from the above, the objective of this research was to analyze the stress profile of medical students at the beginning and end of the first semester.

Method

The research has a quantitative approach since the determination of the behavior of the sample was performed by collecting and analyzing the data through statistics (Sánchez et al., 2018). Regarding the design, this is a descriptive, cross-sectional and analytical type of research, since the stress profile was analyzed and data were collected at two moments at the beginning and the end of the school period (Cocunubo, 2021). The population is made up of first-year medical students of the Autonomous University of Tamaulipas and the sample consisted of a total of 132 students randomly selected during the period from August 11 to December 6, 2019, of which 62.9% (90) are female and 37.1% (53) are male, in terms of age, the results obtained show that 74.1% (106) are between 16 and 18 years old. 23.8% (34) were between 19 and 21 years old and 2.1% (3) were between 22 and 24 years old.

The technique used was the survey and the instrument to collect the data was the Stress Profile, which identifies characteristics and behaviors that protect or contribute to stress-related illnesses (Nowak, 2002: 147). This test is based on Lazarus' cognitive-transactional theory, used on several tests, and generates T-scores for 15 dimensions: stress, health habits, exercise, rest/sleep, eating/nutrition, prevention, ARC group, social support network, type A behavior, cognitive strength, positive appraisal, negative appraisal, threat minimization, problem focus, and psychological well-being (Haynes et al., 1980: 38). The stress profile was developed and standardized for the general population, being adapted and translated into Spanish for its application. The results obtained from the psychometric properties of the original instrument in test-retest reliability are in the range of 0.590 to 0.935 Cronbach's Alpha coefficient (Preciado-Srrano and Vázquez-Goñi, 2010; Pozos et al., 2014). The Statistical Package for Social Sciences (SPSS, 2010) version 2022 was used to evaluate the statistical analysis, systematizing the results through frequency and percentage tables.

Results

The results describe the before (test) and after (retest) of each of the areas in the application of the Stress Profile, in which 132 medical students participated (Figure 1), which showed:

About the exercise area, in the beginning, the high level was 22.7% and at the end of the semester 3% (P = 0.000), observing that they had a significant decrease in physical activity. In the area of rest/sleep, in the beginning, the high level was 0.8% and at the end 1.5 (P = 0.04). In the area of food/nutrition, the high level at the beginning was 14.4% and at the end of the semester, it was 8.3% (P = 0.001), observing a lack of control in the students' food given a load of academic hours, causing inadequate nutrition.

In the area of prevention, a high level of 55.3% was obtained at the beginning, and at the end, it was 24.2% (P = 0.001), the data show that for no reason they tend to avoid risks, so they do not have preventive health habits. In type A

behavior, the beginning of the high level was 15.9% and at the end of the semester, it was 13.3% (P = 0.01). At the beginning of the semester, to deal with stress, students exert excessive pressure to achieve their goals, being impatient or competitive before facing any activity or delay, which decreases a little at the end of the semester.

In threat minimization, the result at a high level was 53% at the beginning and 51% at the end (P = 0.01). In this area, students are observed to reduce the importance of problems when they are in a stressful situation. According to the results in the areas of stress, ARC cluster, social support network, cognitive strength, positive appraisal, negative appraisal, concentration on the problem, and psychological well-being, no significant values were obtained.

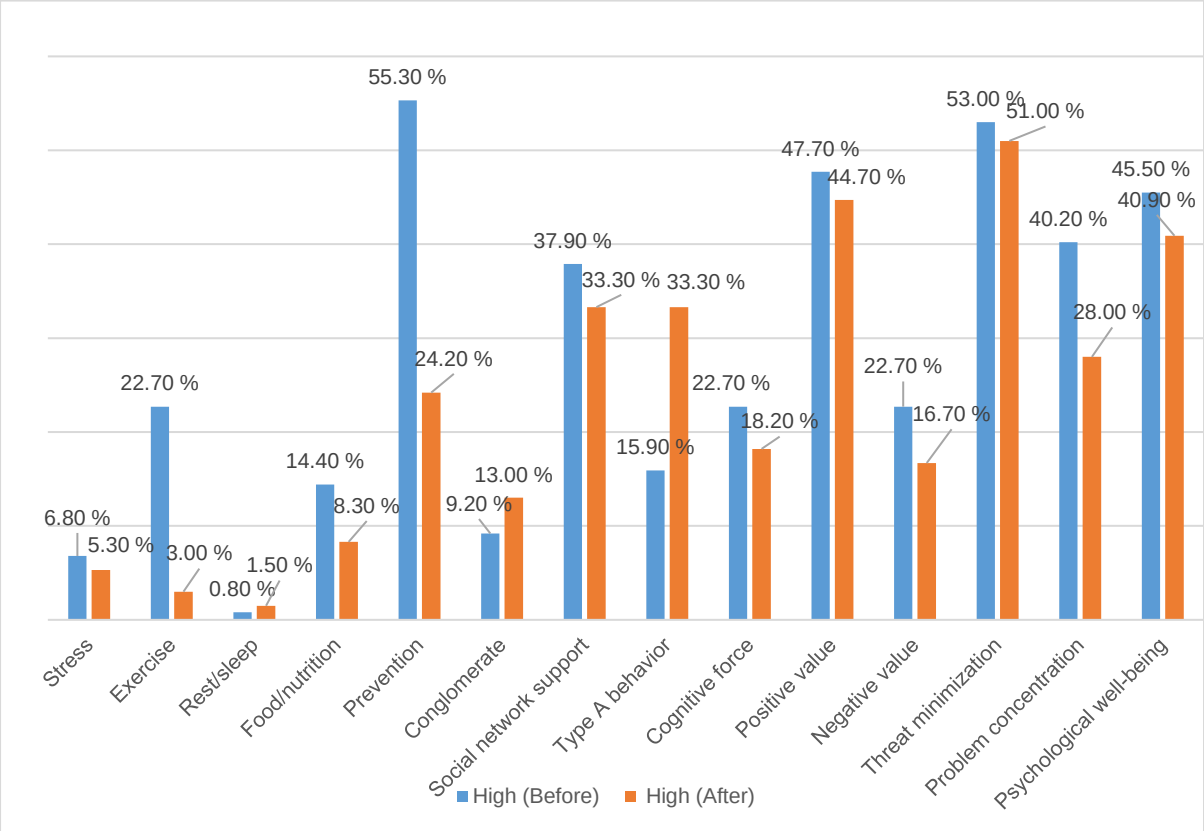

Figure 1. Results of the before (test) and after (retest) of each one of the dimensions in the application of the Nowack Stress Profile.

Discussion

These results coincide with those obtained by Ortiz-León et al. (2019) who obtained a statistically significant increase in rest/sleep (P = 0.046), cognitive strength (P = 0.016), health habits (P = 0.028), exercise (P = 0.034), social support network (P = 0.007) and psychological well-being (P = 0.009), in addition to a decrease in type A behavior (P = 0.017) and negative appraisal (P = 0.011).

However, in the research conducted by Preciado-Serrano and Vázquez-Goñi (2010), the results obtained from the participants show significance in the situations of stress in general, health habits, negative appraisal, and psychological well-being, and in the case of the variables of social support network, cognitive strength, positive appraisal, threat minimization, problem concentration, and psychological well-being, they did not show significance.

Young people entering university may still present adolescent characteristics according to Correa-Correa and Mendoza-Chávez (2021), so

they face the need to make perspective changes in their behavior to adapt to a new lifestyle, and there is no doubt that they will adopt coping strategies very different from those they used in the past to cope with the new demands that arise. According to Camacho and Barraza-Macías (2020), most university students lack strategies or present inadequate academic behavior for these demands.

Along the same lines, Maldonado-Vega and Paucar-Hospina (2021) mention that the changes involved in entering university involve a set of highly stressful situations, since students may experience a lack of control in the new environment where they develop, in addition to other determinants such as the abuse of caffeine, tobacco, psychoactive substances or the intake of tranquilizers that can trigger health disorders leading to school failure (Cabanach et al., 2018; Zárate et al., 2018).

In general, higher education students experience higher levels of stress, anxiety, or depression that influence their well-being and academic performance (Aloufi et al., 2021), which is caused by several stressors that are of great importance because academic stress is a factor that leads to the development of suicidal thoughts (Ying, You, & Guo, 2020); stressors such as financial and work anxiety, as well as institution and professor support on the dropout and academic performance of college students, are also present (Noman et al., 2021).

On the other hand, the pandemic has wreaked havoc on the global economy, causing massive job loss (Hossain, 2021) that has affected students as to participate in synchronous classes they must use a smartphone instead of a laptop or PC, which causes psychological distress such as anxiety and depression, being a high-risk factor for generating academic stress (Wang et al., 2020).

Conclusions

During academic life, the undergraduate medical student is at the mercy of various sources of stress such as the presentation of assignments, practices, tests, and exams, among others, which can have negative effects on overall health and academic performance. This study aimed to evaluate the predominant types of response to academic stress in medical students, whose results revealed a notable incidence in the areas of exercise, rest/sleep, food/nutrition, and prevention, which are the significant reliable protective resources for health, as well as in the items of type A behavior and threat minimization.

Derived from the above, it is observed that students do not perform practices aimed at maintaining health, nor do they develop a specific plan of action in the face of environmental stressors and those of the academic life involved in the career. Therefore, it is a priority to address this situation through interventions that teach strategies to promote stress reduction and thus favorably impact a better quality of life.

Consequently, it is necessary to implement strategies at the institutional level to prevent the effects of stress such as low academic performance, and student dropout, being the techniques used as aromatherapy with lavender oil, and forest therapy help reduce systolic and diastolic blood pressure, among others. Therefore, university institutions should move towards more collaborative and student-oriented models that use information and communication technologies in educational activities under a practical approach to achieve the desired educational objectives during and after the pandemic, in addition to implementing policies to stabilize such systems in terms of availability and accessibility of education due to the COVID-19.

In coping with stressors, university students have sought coping mechanisms using listening to music, watching television, and surfing the internet on topics of general and non-educational aspects, for which policy implementation is a priority and important university activities such as tutoring and academic counseling reduce academic stress in university students.

References

[1] AlAteeq, DA, Aljhani, S., & AlEesa, D. (2020). Perceived stress among students in virtual classrooms during the COVID-19 outbreak at KSA. Taibah University Journal of Medical Sciences, 15(5), 398-403.

[2] Angeles, M. S. and Cañas, K. E. (2019). Stressful events by sex in first-year medical students in a private school. Journal of Psychology of the Autonomous University of the State of Mexico. 8(15): 100-118.

[3] Aloufi, MA, Jarden, RJ, Gerdtz, MF, & Kapp, S. (2021). Reducing stress, anxiety, and depression in undergraduate nursing students: a systematic review. Nursing Education Today, 102, 104877.

[4] APA, American Psychological Association (2019). Psychology topics: Stress. [Online]. Available at: https://www.apa.org/topics/stress/index.html. Consultation date: December 10, 2021.

[5] Ávila, I. Y. C., Cantillo, A. B. and Estrada, L. R. A. (2018). Academic stress in nursing students from Cartagena, Colombia. Nursing Research: Image and Development. 20(2).

[6] Barros-Bastidas, C., & Turpo, O. (2020). La formación en investigación y su incidencia en la producción científica del profesorado de educa- ción de una universidad pública de Ecuador. Publicaciones, 50(2), 167–185. doi:10.30827/publicaciones.v50i2.13952

[7] Bharani, R., Dhivyadharshini, G., Priyanga, A., Iswariya, K., & Joys, JJ (2022). A study on perceived stress and mental well-being among undergraduate medical students. Journal of Positive School Psychology, 6(3), 5746-5752.

[8] Basturk, S.B., Dancer, CEJ, & McNally, T. (2020). Relationship of COVID-19 with Pregnancy. Pharmacological Research, 104743.

[9] Cabanach, R. G., Souto-Gestal, A., González-Doniz, L., and Taboada, V. F. (2018). Profiles of coping and academic stress in university students. Journal of Educational Research. 36(2): 421-433.

[10] Cairo-Martínez, J. C., Cairo-Pérez, J. C., and Mendieta-Pedroso, M. D. (2020). Presence of academic stress in third-year medical students at the "Aleida Fernández Chardiet" Clinical-Surgical Teaching Hospital. Medimay. 27(1): 68-77.

[11] Camacho, C. R. and Barraza-Macías, A. (2020). Validation of the SISCO SV-21 Inventory in Spanish university students. Durango Network of Educational Researchers A. C. [Online]. Available at: http://www.redie.mx/librosyrevistas/libros/validacioninventario.pdf. Consultation date: December 10, 2021.

[12] Cardona, E.Y.B., & Caballero, D.A.V. (2019). Stress and cognitive functioning in university students. Chilean Journal of Neuropsychology, 14(1), 23-29.

[13] Cocunubo, B.S.M. (2021). Relationship between stress coping strategies and academic performance in university students. [Online]. Available at: http://repository.unipiloto.edu.co/handle/20.500.12277/11007. Consultation date: December 10, 2021.

[14] Collados-Sánchez, J. M. and García-Cutillas, N. (2012). Risk of stress in Nursing students during clinical practices. Scientific Journal of Nursing. 4: 1-10.

[15] Correa-Correa, E. J. and Mendoza-Chávez, J. L. (2021). Resilience according to sex in students from two universities in the city of Cajamarca. Available at: http://repositorio.upagu.edu.pe/handle/UPAGU/1486. Consultation date: December 10, 2021.

[16] Cruz, D.A.R., Hernández, M.D.P.R., Morales, M.M.F., Villegas, L.F.U., & Pineda, Y.Z.D.V. (2018). Identification of academic stress in university students. Electronic Journal of Psychology, 8(16), 27-35.

[17] Daher, M., Jaramillo, A., & Rosati, A. (2020). Advances in the integral evaluation: contributions for social programs of intervention in poverty in non-governmental organizations. Journal of Social Studies, (74), 84-98.

[18] de Oca Rojas, Y. M., Bastidas, C. B., & Cabeza, S. N. C. (2022). Research methodology in entrepreneurship: A strategy for the scientific production of university teachers. Social Science Journal, 28(2), 381-391.

[19] Delgado, M. H. S., Castillo, H. H. J., Cavasos, H. C. A., Cervantes, N. E. A. and Guillén, S. F. (2020). Academic stress in young people between 18 and 25 years of age, at a professional level in a private

University in the South of Tamaulipas. Tutoring and Academic Advising Program. 24.

[20] Domez, K.S.R., Valencia, L.P.P., and Contreras, L.V.O. (2020). Stress in nursing students who carry out clinical practices in a university institution of Cartagena-Colombia, 2019: Stress in nursing students who carry out clinical practices in a university institution of Cartagena-Colombia, 2019. Archivos de Medicina (Manizales). 20(2): 437-448.

[21] Escobar-Zurita, E. R., Soria-de-Mesa, B. W., López-Proaño, G. F., and Peñafiel-Salazar, D. D. L. A. (2018). Management of academic stress; critical review. Atlante Notebooks of Education and Development. [Online]. Available at: https://www.eumed.net/rev/atlante/2018/08/estres- academico.html. Consultation date: December 10, 2021.

[22] García, L. H., da-Silva-Gherardi-Donato, E. C., Castillo, M. M. A., da-Silva, R. C., García, P. G., and García, V. M. (2017). Academic stress and alcohol consumption in new income university students / Academic stress and alcohol consumption in new income universities Journal Health NPEPS. 2(1): 133-147.

[23] Gelineau-Morel, R. & Dilts, J. (2021). Virtual education during COVID-19 and beyond. Pediatric Neurology, 119, 1-2.

[24] Gonzalez, L. (2020). Associated with the Covid-19 Pandemic. Article, ix(25), 158–179.

[25] Gonzalez-Lorenzo, S. (2020). Influence of family functioning and subjective well-being on coping strategies in psychology students at Comillas Pontifical University.

[26] Gutiérrez-Huby, A. M. and Amador-Murguia, M. E. (2016). Study of stress in the academic field to improve student performance. Quipukamayoc. 24(45): 23-28.

[27] Haynes, S., Feinleib, M., and Kannel, W. B. (1980). The relationship of psychosocial factors with coronary heart disease in the Framingham Study. Third Eight-year incidence of coronary heart disease. American Journal of Epidemiology. 111(1): 37-58.

[28] Hirsch, C. D., Barlem, E. L. D., Almeida, L. K. D., Tomaschewski-Barlem, J. G., Lunardi, V. L., and Ramos, A. M. (2018). Stress triggers in the educational environment from the perspective of nursing students. Text & Context-Enfermagem. 27.

[29] Hossain, M. (2021). The effect of the Covid-19 on sharing economy activities. Journal of Cleaner Production, 280, 124782.

[30] Husky, M.M., Kovess-Masfety, V., & Swendsen, J.D. (2020). Stress and anxiety among university students in France during the mandatory confinement due to Covid-19. Integrative Psychiatry, 102, 152191.

[31] Khosravani, V., Aardema, F., Ardestani, SMS, and Bastan, FS (2021). The impact of the coronavirus pandemic on symptom-specific dimensions and severity of OCD: A comparison before and during COVID-19 in the context of stress responses. Journal of Obsessive-Compulsive and Related Disorders, 29, 100626.

[32] López, M. J. C., Castillo, A. L., Maldonado, A. A. P., & Casados, J. C. (2020). Strategies to enhance learning and academic performance in university students. Venezuelan Journal of Management, 25(90), 579-594.

[33] Lucio, P. B., Zimerman, A. A., Altamirano, C. A. L., Alcaraz, V. A. L., & Domínguez, J. L. C. (2020). National Survey of Teachers before COVID-19. Challenges for distance education. Latin American Journal of Educational Studies (Mexico), 50, 41-88.

[34] Maldonado-Vega, E. S. and Paucar-Hospina, E. N. (2021). Academic stress and resilience in students of the Faculty of Education of a State University of Huancayo–2020. [Online]. Available at: http://www.repositorio.upla.edu.pe/handle/20.500.12848/2222. Consultation date: December 10, 2021.

[35] Nowack, K. (2002). Stress profile. Mexico: The modern manual. 15 pp.

[36] Ortiz-León, S., Sandoval-Bosch, E., Adame-Rivas, S., Ramírez-Avila, C. E., Jaimes-Medrano, A. L., and Ruiz-Ruisánchez, A. (2019). Stress management; result of two interventions: cognitive behavioral and yoga, in irregular medical students. Research in Medical Education. 8(30): 9-17.

[37] Peña-Paredes, E., Mendoza, L. I. B., Cabañas, R. P., Avila, L. R. and Sales, K. G. G. (2018). Stress and coping strategies in Higher Level Students of the

Autonomous University of Guerrero. NURE research: Scientific Journal of Nursing. 15(92): 1.

[38] Pozos, R. B. E., Aguilera, V. M., Acosta, F. M. and Pando, M. M. (2014). Stress profile and chronic stress in Mexican migrants in Canada. Journal of Public Health. 16(1): 63-75.

[39] Preciado-Serrano, M. D. L. and Vázquez-Goñi, J. M. (2010). Profile of stress and burnout syndrome in Mexican dental students from a public university. Chilean journal of neuro-psychiatry. 48(1): 11-19.

[40] Ramos, V., Pantoja, O., Tejera, E., & Gonzalez, M.S. (2019). Study of work stress and coping mechanisms in Ecuadorian public institutions. Espacios Magazine, 40(7), 8.

[41] Rodríguez-Garza, M. D. R., Sanmiguel-Salazar, M. F., Muñoz-Muñoz, A., and Rodríguez-Rodríguez, C. E. (2014). Stress in medical students at the beginning and end of their academic training. Ibero-American Journal of Education. 66: 105-122.

[42] Rull, M. A. P., Sánchez, M. L. S., Cano, E. V., Méndez, M. T. C., Montiel, P. H. and García, F. V. (2011). Academic stress in university students. Psychology and health. 21(1): 31-37.

[43] Sanchez, V.A. (2018). Relationship between academic stress and suicidal ideation in university students. Eureka. 15(1): 27-38.

[44] Silva, R. M. F., López, C. J. J. and Meza, Z. M. E. C. (2020). Academic stress in university students. Research and Science. 28(79): 75-83.

[45] SPSS, Statistical Package for the Social Sciences (2010). IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 22. Armonk, NY: IBM Corp.

[46] Travesi-Raygoza. A. G., Cocom-Rivera S. G., Och-Castillo J. M., Hernández-Chavez, L. and García-Araiza, H. J. (2020). University stress in medical students of the University of Quintana Roo. Health Quintana Roo. 12(41): 13-17.

[47] Usha, S. and Solomon, M.D. (2022). Academic stress and emotional intelligence of late adolescents attending online classes. Journal of Positive School Psychology, 2766-2778.

[48] Vilca, O. M. L., Espinoza, N. B., Ugarte, V. E. A., & Ramos, J. R. G. (2022). Academic stress in university students in the face of virtual education associated with covid-19. PURIQ, 4(1), 56-65

[49] Viteri, R., & Ileyn, L. (2022). Relationship between academic stress and depression in university students from PUCE-AMBATO (Bachelor's thesis, Pontificia Universidad Católica del Ecuador).

[50] Wang, JL, Rost, DH, Qiao, RJ, & Monk, R. (2020). Academic stress and smartphone dependency among Chinese adolescents: A moderated mediation model. Children and Youth Services Review, 118, 105029.

[51] Ying, J., You, J., & Guo, J. (2020). The protective effects of youthful assets on the associations between academic stress, emotional regulatory self-efficacy, and suicidal risk: a moderately mediated model. Children and Youth Services Review, 119, 105660.

[52] Zárate, N. E., Soto, M. G., Castro, M. L. and Quintero, J. R. (2017). Academic stress in university students: preventive measures. Magazine of High Technology and Society. 9(4): 92-98.

[53] Zárate-Depraect. N. E., Soto-Decuir, M. G., Martínez-Aguirre, E. G., Castro-Castrio, M. L., García-Jau, R. A. and López-Leyva, N. M. (2018). Study habits and stress in students of the health area. FEM: Journal of the Medical Education Foundation. 21(3): 153-157.rch: Scientific Journal of Nursing. 15(92): 1.