



## Academic stress and adaptation to university life: mediation of cognitive-emotional regulation and social support

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**Título:** Estrés académico y adaptación a la vida universitaria: mediación de la regulación cognitivo-emocional y el apoyo social.

**Resumen:** La vida universitaria implica retos personales, sociales, académicos e institucionales a los que los estudiantes deben adaptarse no sólo para lograr el éxito académico sino también para garantizar una buena salud física y mental durante la carrera. Este periodo puede estar influenciado por situaciones estresantes que pueden afectar a nivel personal y académico. El objetivo del presente estudio fue determinar, mediante un análisis con ecuaciones estructurales, si diversas estrategias de regulación cognitivo-emocional y el apoyo social percibido, actúan como mediadores del efecto del estrés sobre la adaptación a la vida universitaria en 555 estudiantes universitarios colombianos (437 mujeres, 78,7%) con edades comprendidas entre los 16 y los 49 años ( $M = 22,83$ ;  $DT = 4,774$ ). Los resultados muestran que las estrategias de regulación cognitivo-emocional positivas (Focalización y Reinterpretación), negativas (Rumiación, Autoculpabilización y Culpar a otros) y el apoyo social son mediadores del efecto del estrés sobre la adaptación a la vida universitaria.

**Palabras clave:** Estrés. Adaptación a la vida universitaria. Regulación cognitivo-emocional. Apoyo social. Estudiantes universitarios.

**Abstract:** University life involve personal, social, academic, and institutional challenges to which the students must adapt not only to achieve academic success but also to guarantee a good physical and mental health during the career. This period can be influenced by stressful situations that can affect at personal and academic level. The objective of the present study was to determine, through an analysis with structural equations, whether various cognitive-emotional regulation strategies and perceived social support, act as mediators of the effect of stress on adaptation to university life in 555 Colombian university students (437 women, 78.7%) with ages from 16 to 49 years ( $M = 22.83$ ;  $SD = 4.774$ ). The results show that the cognitive-emotional regulation strategies positive (Focus and Reappraisal), negative (Rumination, Self-blame and Blaming others) and social support are mediators of the effect of stress on adaptation to university life.

**Keywords:** Stress. Adaptation to university life. Cognitive-emotional regulation. Social support. University students.

### Introduction

University life involves a series of personal, social, academic, and institutional challenges to which the student must adapt (Arguedas, 2010) not only to achieve academic success but also to guarantee a good state of physical and mental health during the career (Chau & Saravia, 2014). This period can be influenced by inevitable stressful situations that, if not properly managed, can affect the student at a personal and academic level (Caballero et al., 2007; Mícin & Bagladi, 2011). Some studies have shown that high stress is associated with poor adaptation and this, in turn, can lead to health problems (Barraza, 2006; Chau & Van den Broucke, 2005), psychopathology (Berking & Wupperman, 2012; Carpenter & Trull, 2013; Cisler et al., 2010; Domínguez-Lara, 2017; Restrepo et al., 2018), low academic performance (Richardson et al., 2012), prolongation, postponement or even abandonment of the study (Álvarez et al., 2011; Álvarez et al., 2006).

Although previous studies have shown the association between stress and difficulty adapting to university life (García-Ros et al., 2011; Martín, 2007; Román et al., 2008), it is necessary to understand the mechanisms through which this relationship occurs since a stressful event by itself does not

generate certain responses, but rather requires an assessment, which can be neutral, positive (when the person has resources) or negative (when a loss or threat is perceived), and depending on this the individual will prepare to deploy strategies to deal with the situation (Lazarus & Folkman, 1986).

Stress refers to a complex reaction (cognitive, emotional, and behavioral) that is generated when an unexpected situation requires great effort or exceeds the coping ability of an individual, who values it as threatening (harm or obstacle) or stimulating (challenge) (Lazarus & Folkman, 1986). Stress is related to physical, mental, or emotional tension generated by environmental, situational, or personal demands. According to the transactional model of stress (Lazarus & Folkman, 1986), interaction with the environment is mediated by cognitive and emotional processes that define the individual's way of coping (Barraza, 2006). The indicators of the imbalance of the cognitive-systemic model of stress (Barraza, 2007) indicate that it involves physical, psychological and behavioral reactions, which vary in terms of manifestation, quantity and intensity in each person and situation (Berrío & Mazo, 2011).

Regarding physical reactions, some theories based on the response to stress state that it affects the homeostasis of the organism, inducing changes in the system that can manifest, for example, body pain and difficulties in sleep organization. Some studies have shown that stress in students is associated with sleep disorders, lack of energy and drowsiness (Mendoza et al., 2010), and somatic complaints such as headache, back pain, stomach ache, palpitations or tachycardias, feeling

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of shortness of breath, among others (Barraza 2007; Bedoya & Vásquez, 2019; Chau & Van den Broucke, 2005; Feldman et al., 2008). As for the psychological reactions, most reported in the literature are worry, anxiety, distress, depression, among others (Cornelisse-Vermaat et al., 2006, Márquez et al., 2009; Vaez et al., 2004; Von Bothmer & Fridlung, 2003). And, finally, the most recurrent behavioral reactions are the increase or decrease in food consumption, isolation, and disinterest in carrying out academic activities (Restrepo et al., 2020).

From the psychosocial point of view, stress within the university environment refers to aspects such as pressure, demands, and dysfunctions that can influence the state of health, emotional well-being, interpersonal relationships, performance and adaptation of students (Alfonso et al., 2015) based on the interaction between stressful events, the perception of them, mediating variables (for example, coping strategies and social support) and the effects of this experience (Berrío & Mazo, 2011; Caldera et al., 2007; Martín, 2007).

According to Lazarus and Folkman (1986), to cope with stress, “constantly changing cognitive and behavioral efforts that are developed to handle specific external and/or internal demands that are evaluated as excess or overflowing of the individual's resources are required” (p. 141); within this process, the person sometimes presents some adaptive strategies and other maladaptive ones. The former is those that are more functional aimed at actively coping with the stressful situation (Contreras & Esguerra, 2006; Sicre & Casaro, 2014), and the maladaptive ones that correspond to avoidance behaviors may be less functional (Barra & Vaccaro, 2013; Brissette et al., 2002).

The hypothesis of coping as a restorer of systemic balance emerges from the cognitive-systemic model of stress (Berrío & Mazo, 2011), which proposes that, given the imbalance caused by stress, the person uses various strategies, among which find emotional regulation (Gross, 1998). This is defined as the set of cognitive processes (automatic or controlled, conscious or unconscious) that influence the experience, management, and expression of emotions to adapt to a context or depending on the goals of the individual (Gross, 1999; Gross & Thompson, 2007), and whose purpose according to Koole (2009) is to guide the flow of emotions, whether positive or negative, towards an increase, maintenance or decrease.

Cognitive emotion regulation refers to the conscious cognitive way of handling emotional information (Garnefski et al., 2002), which is part of the concept of emotional regulation related to extrinsic and intrinsic processes responsible to monitor, evaluate and modify emotional reactions, specifically their intensity and duration characteristics (Gross, 1999; Thompson, 1994). Although there are many forms of emotional regulation, this study will address the proposals by Garnefski and Kraaij (2007), among which are some associated with negative affect such as Ruminating (thinking excessively about feelings or problems associated with a negative event), Catastrophizing (anticipatory thoughts of exag-

gerated or disproportionate consequences), Self-blaming and Blaming others (causal attribution of the event to oneself or others respectively). Among the strategies associated with positive affect are Positive reappraisal (pleasant and happy thoughts after a negative event), Positive reinterpretation (giving new meaning to the situation without focusing on the negative consequences), Putting into perspective (relativize gravity of the event comparing it with other negative events or reconsidering its impact), Acceptance (experiencing the events without judging them or trying to change them), Refocalization of plans (diverting thought towards strategies focused on solving the problem) (Garnefski & Kraaij, 2007).

As part of the set of strategies for coping with stress, there is social support (García-Alonso & Medina-Gómez, 2016), which can be defined as the perception that one has of emotional support, of sharing common interests, of being understood and respected by close people (Feldman et al., 2008). Also, it refers to the social, material and informational resources (Berrío & Mazo, 2011) that function as a protective factor against stress, allowing adjustment, adaptation, performance, and satisfaction (Chau & Saravia, 2014; Román & Hernández, 2005) and which in turn is associated with health and well-being (Rosa-Rodríguez et al., 2015; Walton & Cohen, 2011).

From the transactional stress model (Lazarus, 2000), adaptation, in general, implies adjustment to internal and/or external demands and pressures. For its part, adaptation to university life implies a constant effort by the student to respond to internal and academic demands, which due to its changing nature can trigger stress and affect performance (Rodríguez-Ayan & Sotelo, 2014). In this regard, Almeida et al. (2002) and Soares et al. (2006) propose three domains of university adaptation. The first refers to the Student and is related to their autonomy, perception of competition, physical and psychological well-being; the second refers to the Course and has to do with adaptation to it, performance, study methods, knowledge, time management, anxiety about evaluations, etc. Finally, there is the Context, referring to institutional adaptation, extracurricular activities, relationships with peers, economic, and family resources. From these three domains, five specific domains emerge to operationalize the measurement of the concept of university adaptation, namely: Personal (focused on the student and their well-being), Career and Study (focused on the Course, future perspective and ability to manage academic demands), Interpersonal and Institutional (focused on the Context, interpersonal relationships, interaction with the institution and with administrative staff) (Almeida et al., 2002).

The health of students in universities is a topic of interest not only for medicine and psychology, due to the short, medium and long-term effects, but also for universities because academic failure and student desertion are problematic every more frequent, which studied this reality in Colombian universities and contrast with international studies would identify issues that require timely intervention, to promote healthier universities, proposing strategies and alternatives for uni-

versity students to take responsibility, assume an active role of self-care and that they are capable of generating a healthy life project as part of their personal, academic and professional training.

Based on the transactional model of stress, the objective of the present study was to determine, through an analysis with structural equations, whether various cognitive-emotional regulation strategies and various forms of perceived social support, act as mediators of the effect of stress on adaptation to university life. Additionally, measurements on health behaviors, general and mental health were included to assess their relationship with stress and adaptation. The study hypothesis was that both regulation strategies and social support partially mediate between stress and adaptation and that there are also relationships between these and health, quality of life, and mental health behaviors. From the results, programs could be proposed and implemented aimed at the intervention of psychological regulation in stressful situations and optimization in the use of social resources.

## Method

### Sample

The study was carried out with 555 Colombian university students (437 women, 78.7%) between the ages of 16 and 49 ( $M = 22.83$ ;  $SD = 4.774$ ) from different cities in the country. There were undergraduate students from all ten semesters of the university ( $M = 5.95$ ;  $SD = 2.444$ ), being the type of sampling for convenience.

### Measures

*SISCO Inventory of Academic Stress* (Barraza, 2007) contains 5 sections, 31 items distributed as follows: a filter item that allows determining if the person is a candidate to answer the test. An item that identifies the intensity level of academic stress; 8 items on the frequency in which the demands of the environment are valued as stressors; 15 items that measure the frequency with which stress stimulus reactions occur, and 6 items that identify the frequency of use of coping strategies. In Colombia, the factorial structure proposed by the original author has been confirmed (Malo et al., 2010). Cronbach's alpha of the questionnaire in the present study was .88.

*Cognitive Emotion Regulation Questionnaire* (CERQ, Garnefski & Kraaij, 2007, the Spanish version of Dominguez & Medrano, 2016) it contains 36 items and measures 9 strategies (Rumination, Catastrophization, Self-blame, Blaming others, Putting into perspective, Acceptance, Positive reappraisal, Positive reinterpretation, Refocalization of plans) with 4 items each that are scored on a Likert scale from 0 to 5. Cronbach's alpha of the questionnaire in the present study was .87.

*Perception of Social Support* it was measured with questions created *ad hoc* by asking the students in a scale from 0 to 10

how much support do they think they receive in their studies from Parents, Friends, Teachers and the University (for example services such as Library, academic advising, psychological service, etc.).

*Student Adaptation to College Questionnaire* (SACQ, Baker & Siryk, 1989). Composed of 50 items divided into 4 dimensions (academic, social, personal-emotional, and institutional adaptation) and 3 additional items that are part of the total score. It has a Likert-type response format with 9 options from 1 (not applicable at all) to 9 (applies to me). The adaptation to Spanish made by Rodríguez et al. (2012) found Cronbach's alpha coefficients of .95 for the global scale and between .79 and .83 for the other scales. The Cronbach's alpha for the global scale in the present study was .87.

*SF-36 Health Questionnaire* (Ware & Sherbourne, 1992) consists of 36 items that describe the transition of health status in the last year and eight specific areas (General health perception, Physical function, Social function, Physical role, Emotional role, Mental health, Vitality, Body pain). The validity and reliability of the instrument have been confirmed in the Colombian population (Lugo et al., 2006).

*Health Behaviors* were measured with a 30-item questionnaire created by Cassaretto et al. (n.d.) for which they took the first part of the CEVJU Health and Lifestyle Practices Questionnaire from Arrivillaga & Salazar (2005) and the Questionnaire for the measurement of physical health (nutrition, sexuality, and sport) used for the study with university students from the Consorcio de Universidades (2006). It measures health habits in 5 areas: a) Sleep organization, b) Recreation and free time management, c) Condition, physical activity, and sport, d) Eating habits, and e) Consumption of alcohol, tobacco, and other drugs. Cronbach's alpha of the questionnaire in the present study was .78 for the global scale.

*The General Health Questionnaire* (GHQ-12, Goldberg, 1978). It is an instrument used to assess mental health in the general population. It is made up of 12 items that measure two dimensions: psychological well-being and functioning. Internal consistency of .78 and a two-factor structure were reported in the general population in Colombia (Campo, 2007). Cronbach's alpha of the questionnaire in the present study was .90.

### Procedure

The project was approved by the Ethics Committee of the Universidad Cooperativa de Colombia by act number 002 of March 14, 2018. The request for sampling was presented to different universities in several cities in Colombia. Once the study was presented, to those who agreed to participate voluntarily were sent a link with the digital questionnaire that include the informed consent, in accordance to Resolution 8430 of 1993 of the Colombian Ministry of Health, since this is a study classified as "With no risk" considering that the tests used are not for diagnostic but for screening, so they may not require a printed signature for

consent and the expressed acceptance of the participant in the online form is sufficient. This link also contains the sociodemographic questionnaire and the scales that were answered using a computer with internet access.

### Statistical Analyses

Exploratory Factor Analysis (EFA) was run on IBM SPSS v. 24 with all the dimensions (as described in the previous section) of the instruments through the principal axis factoring and through the Promax rotation method to find a good measurement model. The pattern matrix of this model was imported in IBM AMOS v. 24 where analyzes were performed to find the measurement model with the best goodness-of-fit indexes using the maximum likelihood method. From this measurement model, the Structural Equation Modeling (SEM) began. Skewness was assessed to verify the multivariate normality of the sample. Relative chi-square (CMIN/DF), Root Mean Squared Residual (RMR), Goodness of Fit Index (GFI), Normed Fit Index (NFI), Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA),  $\rho$  of Close Fit (PCLOSE) and Standardized Root Mean-Square (SRMR) were calculated to assess the fit of the data to the hypothetical model. Bootstrapping was used to test direct, indirect, and total effects.

### Results

The first EFA resulted in ten factors (KMO = .871 and Bartlett's test of sphericity  $p < .000$ ) that explained 52.32% of the variance. Because some dimensions did not meet the criteria (coefficients greater than .4), they were removed. These dimensions were: Eating habits (CEVJU), Control of drug use (CEVJU), Functioning (GHQ-12), General perception of health (SF-36), Social function (SF-36) and Coping strategies (SISCO). A second EFA was performed that resulted in eight

factors (KMO = .860 and Bartlett's test of sphericity  $p < .000$ ) that explained 54.03% of the variance.

Again, the dimensions with coefficients below .4 were eliminated: Physical activity and sport (CEVJU) and Physical role (SF-36). This third analysis resulted in eight factors (KMO = .859 and Bartlett's test of sphericity  $p < .000$ ) that explained 57.76% of the variance. The following dimension was removed due to the value of the coefficient: Physical function (SF-36). A new EFA was performed that resulted in seven factors (KMO = .858 and Bartlett's test of sphericity  $p < .000$ ) that explained 57.15% of the variance. The following dimensions were eliminated due to having coefficients lower than .4: Recreation and free time management (CEVJU) and Self-care and medical care (CEVJU). This EFA resulted in six factors (KMO = .856 and Bartlett's test of sphericity  $p < .000$ ) that explained 57.44% of the variance. The Personal Adaptation dimension (SACQ) was eliminated because it had no theoretical correspondence with the factor and the last analysis was performed. Finally, six factors were obtained (KMO = .839 and Bartlett's test of sphericity  $p < .000$ ) that explained 56.80% of the variance.

The pattern matrix was imported into IBM AMOS v. 24. An analysis was performed to find the measurement model with the best goodness-of-fit indices using the maximum likelihood method. An exploration of the initial model showed the need to eliminate the sixth factor because it only had two dimensions, Mental Health (SF-36) and Vitality (SF-36), and did not allow the analysis to be run. A measurement model with five factors remained, called: Stress (6 dimensions), Positive regulation (4 dimensions), Negative regulation (4 dimensions), Social support (4 dimensions), and Adaptation (3 dimensions). The multivariate distribution of this model was not normal (kurtosis = 79.39). The values of the indices were: CMIN / DF = 5.34; RMR = 2.059; GFI = .848; CFI = .858; RMSEA = .088; PCLOSE = .000. Table 1 shows the validity measures of the model.

**Table 1**  
*Validity Measures of the Measurement Model.*

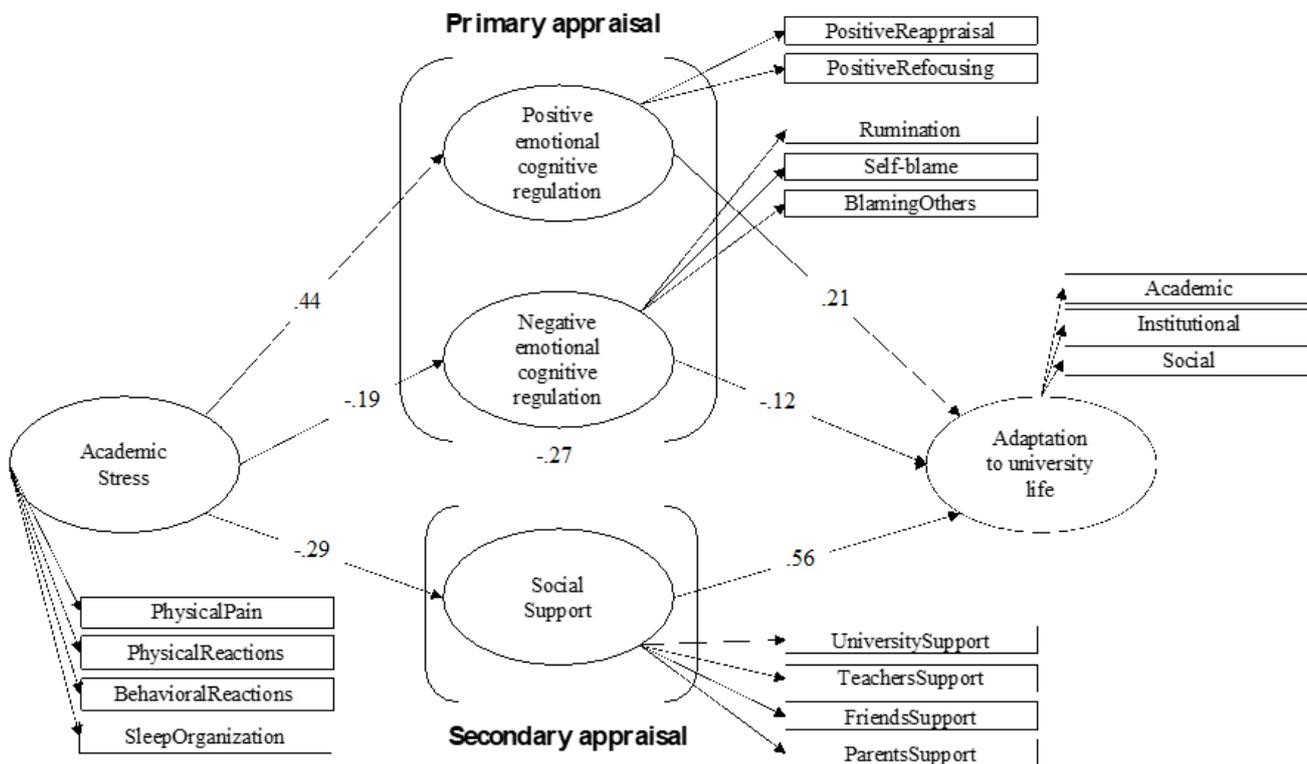
	CR <sup>1</sup>	AVE <sup>2</sup>	MSV <sup>3</sup>	S	PR	NR	SS	A
Stress (S)	0.81	0.56	0.28	0.75				
Positive Reg. (PR)	0.80	0.52	0.08	-0.16**	0.72			
Negative Reg. (NR)	0.78	0.48	0.25	0.50**	0.10*	0.69		
Social support (SS)	0.75	0.45	0.42	-0.29**	0.11*	-0.11*	0.67	
Adaptation (A)	0.79	0.57	0.42	.053**	0.28**	-0.31**	0.65**	0.75

<sup>1</sup>CR = Composite Reliability; <sup>2</sup>AVE = Average Variance Extracted; <sup>3</sup>MSV = Maximum Shared Variance. \* $p < .01$ ; \*\* $p < .001$ .

From this measurement model, the Structural Equation Modeling (SEM) began. To test the hypothesis that positive and negative regulation and social support are mediators of the effect of stress on adaptation to university life, the model shown in Figure 1 was constructed. Through the revision of the modification indexes, the following changes were made: error 21 and error 19 were correlated, the Acceptance and Putting into perspective of the Positive Regulation factor;

Catastrophization of the Negative Regulation factor, and the Quality of life and Psychological reactions of the Stress factor were eliminated. The goodness of fit indices was: CMIN / DF = 2.95; RMR = 1.563; GFI = .940; NFI = .914; CFI = .940; RMSEA = .060; PCLOSE = .22; SRMR = .0492. All direct and indirect standardized effects were statistically significant for  $p < .001$ .

**Figure 1**  
Structural Equation Model of Direct and Indirect Effects (Primary and Secondary Appraisal) of Stress over Adaptation.



## Discussion

As it could be seen in the results previously described, none of the dimensions of mental health measurements were included in the final model, and only a general health dimension (of the initial eight) and a health behavior dimension (of the initial five) did both associated with stress. On the other hand, the fact that only a relationship has been found between the dimensions of body pain, physical reactions, behavioral reactions and sleep organization with stress, can be understood from the fact that university students, when facing greater academic demands that cause stress, may experience exhaustion, lack of interest and self-criticism (Caballero et al., 2007), which could explain the physical and psychological manifestations of stress reported in this study, besides, the sleep disorders are the most frequently present in university students, with a high prevalence of drowsiness or increased need for sleep (Mendoza et al., 2010).

Likewise, González et al. (2018), in their study on the effects on physiological responses generated by stress based on coping style, showed that students who use low active and social coping they are undergoing major alterations in physiological responses to stress such as physical exhaustion, sleep disturbances, irritability, and negative thoughts, and students who use active and social coping are the least experiencing physiological changes in stressful situations.

The main finding of the present study partially confirmed the hypothesis since the factorial and structural analysis allowed establishing a mediation model in which stress has direct and indirect effects on adaptation to university life through positive and negative emotional cognitive regulation and social support, whose effects were statistically significant. Standardized coefficients and their signs indicated that positive regulation and social support reduce the negative effect of stress on adaptation, while negative regulation worsens the effect of stress. Furthermore, social support has a greater effect on the relationship between stress and adaptation.

According to the transactional model of stress (Lazarus & Folkman, 1986), the individual response to stimuli depends on the cognitive evaluation that makes of them through a primary assessment, which involves evaluating the threat of the situation, and a secondary assessment, which involves evaluating the resources available to deal with the stressful situation. Positive and negative emotional cognitive regulation is part of the mechanisms involved in the primary cognitive evaluation. In the present model, positive focusing and positive reappraisal constituted the positive factor; and rumination, self-blaming, and blaming others, the negative factor. On the other hand, social support is part of the mechanisms on which secondary evaluation depends, and in the present model was formed based on the perception of

social support from parents, friends, teachers, and the university.

Positive reappraisal and positive refocusing are active coping strategies related to positive psychological states (Folkman, 1997). Both strategies are characteristic of the optimistic cognitive style of people who try to make the best of any situation. Some studies have indicated that optimism improves academic performance (Gordeeva et al., 2020; Tetzner & Becker, 2017) and has been considered as a factor that promotes positive adaptation and resilience in university life (Leary & DeRosier, 2012; Meneghelet al., 2019).

Homework overload, evaluations, class participation, written assignments, and exposures have been reported in the literature as the most frequent stressors among university students (Berrío & Mazo, 2011; Restrepo et al., 2020) because they test the student's academic efficiency and effectiveness. Then, the self-efficacy perceived by the student is key in evaluating these situations as stressful. Self-efficacy has been associated with optimism (Karademas, 2006) and academic performance (Meral et al., 2012). Being able to regulate thoughts and emotions is a measure of cognitive regulatory capacity, which is associated with self-efficacy and beliefs about self-efficacy in emotional regulation (Alessandri et al., 2014). Positive psychological states can improve cognitive functioning (Ashby et al., 1999), allow adaptive coping (Folkman & Moskowitz, 2000) and lead to rewarding and enriching social exchanges (Fredrickson & Joiner, 2002). All of these favor adaptation to university life, since they can positively affect academic performance, psychological well-being, and social relationships.

Contrary to previous regulatory strategies, rumination, self-blame, and blaming others are associated with negative psychological states. Self-blame and rumination are among the most important predictors of negative emotions (Martin & Dahlen, 2005). Rumination is one of the factors mainly related to depression and anxiety (Aldao et al., 2010) and some harmful effects associated with it have been identified, such as negativism, poor ability to solve problems, inhibition of instrumental behavior, reduction in social support, worry and inattention (Lyubomirsky et al., 2003; Nolen-Hoeksema et al., 2008). Rumination is considered a type of maladaptive coping (Thompson et al., 2010). After all, it affects the individual's response to stressors, causing more detrimental consequences on behavior, because it does not allow the individual to seek a solution to the problem, but rather forces him to stay focused on concomitant negative thoughts and feelings. Furthermore, it is a predictor of psychological distress in university students (Morrison & O'Connor, 2005) since its negative effects on cognitive functioning may explain why this form of coping affects academic performance. Impairments in cognitive flexibility, inhibition, and attention due to rumination have been documented even after controlling for negative mood (Brinker et al., 2013).

Self-blame is related to a decrease in self-esteem, hopelessness, and depressed mood (Zahn et al., 2015), which could also affect the ability to cope with the academic, eco-

nomie, social, and institutional stressors of the university life. As for blaming others, not much literature is available, however, it is most likely a personality trait with low levels of consciousness and low levels of perceived control, which induces a feeling of helplessness and loss of control that undermines confidence to solve problems and deal with problematic situations (Skinner & Zimmer-Gembeck, 2011). Rumination, self-blame, and blaming others are regulatory strategies in which cognition and emotion focus on the causes of the problem and not its solution. In this way, the negative thoughts and emotions associated with failure are likely to worsen. These forms of maladaptive coping affect not only on college adjustment but also affect students' mental and physical health. Maladaptive coping is related to a lower quality of life and psychological well-being. Therefore, students are more vulnerable to unhealthy habits, which will exacerbate the problem.

Social support refers to the social resources that people perceive as available when they need help to face a situation that exceeds their resources. Social support arises from the network of interpersonal relationships that individuals build with other people, social structures, and institutions (Williams et al., 2004). Each of them is an additional resource for the student when facing difficult situations. According to the present model, perceived social support from parents, friends, teachers, and the university cushion the effect of stress on adaptation. Parents and friends probably offer emotional support, while teachers and the university provide instrumental support (academic support).

Although university students are mostly young adults ages 18 to 26, parents can be important in promoting beneficial educational outcomes and can predict functioning. A family environment that is perceived as involved and support with autonomy will promote the persistence of students in the university (Ratelle et al., 2005). As reported in other studies, parental emotional support is negatively correlated with stress (Sy et al., 2011). For their part, friends and colleagues also have a positive effect on academic performance and adaptation to university life through the creation of emotional and intellectual support networks, such as the relationships of close friends or study groups (Cousins et al., 2017; Swenson et al., 2008). According to Stadtfeld et al. (2019), socially isolated students have significantly lower test scores and are more likely to dropout of college.

Teacher's support is also negatively correlated with stress, anxiety, depression, shame, anger, worry, boredom, and hopelessness in college students (Lei et al., 2018). Although teachers are among the top academic stressors for students, they are also, but not the only, motivators and providers of academic support (Thompson & Mazer, 2009). Regarding the social support received by the university, one of the main tasks of the higher education institutions in the country is that from the different instances that take care of the university welfare seek to reduce the impact of different adverse factors that may affect the academic performance of their students, through the implementation of support, ori-

entation and programs in different aspects that facilitate the coping with university demands and minimize possible negative effects (Denovan & Macaskill, 2017; Fornés-Vives et al., 2016).

Thus, the relationship found in this study between institutional support with stress and adaptation to university life can be explained because there are institutional aspects that generate the perception of being accepted, which increases the sense of belonging, health, and well-being in the students (Walton & Cohen, 2011; Zepke & Leach, 2010). Taking into account that social support is a resource for coping, a greater perception of social support is associated with a lower intensity of academic stress (Feldman et al., 2008), constituting a protective factor that enables adaptation, enhances performance and satisfaction (Román & Hernández, 2005), and increases the probability of success in the comprehensive training process.

The findings reported in this research offer evidence of the importance of guiding student health services towards promoting positive aspects related to health. Along these lines, the results suggest strengthening those instances that promote the perception of support that teachers and the different instances within the institution provides to students. Also, another action aimed at student health care is based on promoting the use of positive cognitive-emotional regulation strategies and the replacement or reduction of the use of negative strategies, as well as the adequate management of academic stress. This proposal is consistent with the World Health Organization's Skills for Life approach (WHO, 2003), which proposes the development of capacities that allow individuals to face the challenges of the contemporary world in different contexts, among them the academic field. Finally, it is considered that strengthening social support, emotional regulation and stress management enhances personal and interpersonal resources that will allow students to have tools to adapt to university life, helping them to fulfill their comprehensive training objective.

## Conclusions

The implementation of a structural equation model allowed a complex analysis verifying the direct contribution of a set of independent variables, which could be called predictors (stress) and/or moderators (strategies of cognitive-emotional regulation and social support), and their interaction and influence on a dependent variable (adaptation to university life), making it possible to validate a theoretical and empirical model. On the other hand, the SEM evidences the validity of the instruments controlling possible measurement errors, with which it can be said that the scales used in the present study are valid and reliable instruments for the measurement of the study variables in the country and university population composed mostly of young adults.

The results of the present study confirm that the cognitive-emotional regulation strategies positive (Focus and Reappraisal), negative (Rumination, self-blame and blaming

others) and social support are mediators of the effect of stress on adaptation to university life, which in practice can be used to understand the underlying mechanisms of that relationship, and at the same time show where the prevention and promotion plans and programs that seek to reduce stress involvement in university students should be directed. That is, these results can be used as evidence to guide prevention, promotion, and health education programs from university welfare entities, which guide the strengthening and use of positive cognitive-emotional regulation strategies, social support, and healthy habits life in the presence of stressful situations in the academic and interpersonal field, to guarantee a better adaptation to university life in all its spheres, which in turn would influence a better state of health and academic success.

The results of the present study should be interpreted with caution due to certain methodological limitations. Some of the measurement instruments have not been psychometrically analyzed in the country where the study was conducted, nor do they have adaptations to the population with which they worked. Additionally, a large part of the sample was made up of women, as well as students from the social sciences area. A cross-sectional design does not allow to draw a causal ordering among the variables, however, the SEM analysis provides some information about the possible direction of the relationship.

For future studies, the implementation of longitudinal designs is recommended, to evaluate the evolution of the emotional response of students in the three stages of university life (beginning, intermediate, and end -the time of practices-). Thus, it could be identified whether academic stressors and coping strategies vary according to these stages. It is also convenient to include self-report instruments, measures of external informants, such as parents and teachers, and the use of structured interviews. Control the number of students by semester and career, trying to have a proportionate sample of the initial, intermediate, and final levels. Some studies have shown that the emotional response of students can vary depending on the particularities of the careers (medical sciences vs. social sciences vs. engineering/mathematics), so care must be taken with the selection of participants, trying to include just one of these areas or, if several are included, have a balanced amount for each group.

Despite these limitations, the hypothesized relationship has been found among all the variables, consistent with previous theories and research, and is also one of the few studies carried out in the region that seek to address these variables using a structural equation model, and based on a sample of students from different universities and cities around the country.

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