

Multivariate Analysis of Factors Related to Emotional Regulation and Executive Functions in Adolescents Post Covid-19

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Abstract

The confinement by Covid 19 affected several aspects of the lives of human beings. In addition to the health affectation, there was evidence of havoc in the emotional life of the people, in this case the analysis is focused on the emotional regulation strategies that the adolescents were able to develop and how they were dynamized with some indicators of executive functions. By means of a multivariate analysis, the strategies of emotional regulation and the relationship with the development of ex-ecutive functions in Ecuadorian adolescents were analyzed. The instruments used were: Emotional Regulation Questionnaire and EFECO Scale for Executive Functions in self-report format. The results show that most adolescents use emotional regulation strategies such as cognitive reap-praisal and emotional suppression; the components of inhibition, cognitive flexibility, initiative, planning, working memory, monitoring, emotional control and organization of materials present high average levels, reaching an optimal development in adolescence; the emotional regulation strategies and the components of the executive functions present a positive correlation. According to the multivariate analysis, the development of executive functions is dependent on emotional regulation strategies. Cognitive reappraisal as an emotional regulation strategy is significantly related to emotional control in the study sample.

Keywords: Adolescents; emotional; regulation; executive functions; emotions.

1. Introduction

Adolescence is one of the crucial and important stages in the development of every human being, in which great changes occur at neuropsychological (attention, planning, language, working memory, etc.), biological (body changes, sexual maturity), physical, psychological, social levels, where adolescents experience intense emotions and face stressful situations (Lillo Espinosa, 2004; Hidalgo Vicario y Ceñal González-Fierro, 2014; Igor et al., 2017; Marcia Olhaberry y Sieverson, 2022). Stressful situations that can cause, in almost 13% of people, important indicators of emotional uncontrol, presenting symptoms of sudden changes in mood. Unicef indicates that at some stage of life some psychological behavioral alteration occurs, and both international organizations agree that adolescents are a population that can be considered vulnerable due to the different situations that affect the regulation of emotions (Unicef, 2021).

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Within the development of the emotional life of the adolescent, it is important to consider the macro and micro contexts of social and emotional development, in this sense the macro context of confinement derived from the situation of the Covid 19 pandemic, caused alterations in the physical conditions and mental health of individuals (Palacio-Ortiz et al., 2020; Mahapatra y Sharma, 2020). The confinement caused havoc in the process, in which adolescents learn to regulate emotions due to the scarce development of interaction and self-regulation strategies, the difficulty to express them increased the prevalence of mental health disorders (Zumba Tello y Moreta Herrera, 2022).

Emotions represent a neuropsychobiological process that allows individuals to adapt to their environment, ensuring their survival (Tabernero y Politis, 2014). Thus, individuals, in their process of development and evolution have learned to regulate their emotions, opting for strategies that facilitate such adaptation (Godínez Castillo y Flores, 2019). Bisquerra (2016) points out that emotions can be of three types: positive, negative and ambiguous. Positive emotions are characterized by being pleasant, ensuring well-being. Negative emotions, are shown as threatening, loss of emotional well-being. Ambiguous emotions are categorized as positive or negative depending on the context of the event. Human beings possess the appropriate capacity to manage their emotions in unpleasant situations and possess coping tools to regulate their emotions (pág. 47).

Emotion management is due to the process of emotional regulation (ER) that the person can develop (Pérez Lalama et al., 2020), this process achieves that person can express their emotions to modulate the duration and intensity of their response. ER is important for both physical and mental health, as well as academic and work performance of individuals (Andrés et al., 2017; Andrés et al., 2020).

In addition, emotional regulation is linked to ER strategies, due to the fact that they allow changing the individual's emotional experience and response. Thus, emotional regulation strategies contribute to the emotional processing of the individual, decreasing the emotional impact, resignifying or modifying the thoughts about a particular situation (Gross J. , 2014; Tani et al., 2015; Sarmiento Henrique et al., 2017; Andrés et al., 2020).

Bisquerra, proposes five emotional competencies: emotional competence, emotional regulation, emotional autonomy, social competence and competence for life and well-being (Bisquerra Alzina, 2003; Bisquerra Alzina y Pérez Escoda, 2007; Fragozo Luzuriaga, 2015). Gross (1998) proposes several types of emotional regulation strategies: such as situation selection, modification, attentional deployment, cognitive change and modulation of emotional response. Based on research, he elaborates his own model, in which he distributes two strategies of emotional regulation (2003): cognitive reappraisal and suppression. Cognitive reevaluation consists of modifying those emotional stimuli or irrational thoughts by those that help us to have a positive attitude. Expressive suppression refers to the emotional response, in the inhibition of emotions.

In recent years, Cognitive Neuroscience, Behavioral Neurology and Neuropsychology have shown a growing interest in the study of the neural substrates and brain activity of cognitive processes, especially executive functions (Tirapu Ustárriz y Lario, 2008).

Portellano defines executive functions as a "set of high-level cognitive skills that allow the resolution of complex problems" (2009). For Verdejo García and Bechara, executive functions are "a set of skills involved in the generation, monitoring, regulation, execution and readjustment of appropriate behaviors ..." (2010). Other authors call executive functions (EF), as a set of higher order processes that comprise a series of cognitive mechanisms, in which tasks or mental operations are performed: conflict resolution, decision making, planning, reasoning, emotional behavior regulation and systematization of input and output information for task execution (Bombín y otros, 2014; Acosta Rodríguez y otros, 2017; Pérez Lalama y otros, 2020; Michelli, 2020; Hernández y otros, 2021), maintaining a good performance in the social, cognitive and psychological area. The participation of the mentioned tasks or activities, are those that have a relationship

with the frontal cerebral lobes in which they are involved in the regulation and processing of the emotional response before a stimulus.

Executive functions (EF) develop sequentially and progressively from childhood to adolescence and are involved in the capacity for self-control, emotional regulation and organization of behavior (Rodríguez-Martínez et al., 2021). So these manifest a greater development in adolescence, due to the fact that a greater perception and discrimination of daily life situations is presented, and also all these functions are integrated allowing greater control of cognitive, emotional and behavioral capacity (Belloa y Monroy, 2019). It depends on the maturation of the prefrontal cortex and this process starts from the birth of the individual until strengthening between 20 and 25 years, highlighting reaching the capacity for conflict resolution, planning and linguistic mastery between 18 and 29 years (García Molina et al., 2009). On the other hand, Best and Miller (2009) propose four stages in which executive functions develop.

In adolescence, social, cultural and academic demands increase, so that emotional regulation strategies, development and maturation of executive functions allow the individual to actively participate to counteract them (Andrés y otros, 2020). Indeed, emotional regulation intervenes in the development of executive functions, specifically attention, decision making, inhibition, working memory and cognitive flexibility (Medranoa et al., 2016; Andrés et al., 2016). On the other hand, emotional regulation allows mechanisms to be activated by which they evaluate and modify a person's emotional state to opt for strategies that result from some cognitive processes. Considering this, it is important to pay attention to the strategies of -emotional regulation given that they are the key to develop and maintain mental health in young people (Extremera et al., 2020)

Emotional regulation is conditioned by neurological and neuropsychological maturity, so that a deficit, alteration or impairment of the frontal lobes implies a problem in regulating emotions and social behavior (Perry y Dollar , 2021). When an individual experiences a particular situation, he generates strategies that allow him to cope with the situation and in turn regulate his emotions in order to optimize his resources and achieve his personal and social goals (Cantero García y Alonso Tapia, 2018; Olhaberry y Sieversobn, 2022).

Studies indicate that executive functions have an impact on the emotional and behavioral regulation of adolescents, in such a way that monitoring involves supervising and being aware of their behavior and planning their activities; inhibition allows them to suppress inappropriate behaviors and maintain their attention on the activities they are performing; working memory is indispensable to maintain information and regulate appropriate behavior in classes; cognitive flexibility involves using strategies to respond appropriately to their educational context; organization of materials is important for the learning process; planning allows maintaining a sequence or order to perform tasks; and emotional regulation regulates emotional expression and response (Ramos y otros, 2017).

Some researchers explain that in adolescence the development of the prefrontal cortex continues and cortical regions are immature, which leads to disruptive behaviors, instant gratification and lack of emotional regulation. Thus, from a neuropsychological point of view, it is necessary to pay attention to adolescents since their executive functions are in the process of neuropsychological maturation, so they will present greater difficulty in regulating their emotions and behavior (Herrerias , 2014). From a social perspective, it is important to know to what extent emotional regulation is related to executive functions, due to the fact that they have an impact on the cognitive and emotional development of the adolescent (Lopera y otros, 2018). Knowledge of these bases implies improving the quality of life and the integral development of the individual, through early intervention from the therapeutic and psychoeducational field.

It is important to determine the role of emotional regulation in the development of executive functions in adolescents aged 14 to 17 years, raising the following questions:

- What are the emotional regulation strategies present in adolescents?
- How are executive functions performed in adolescents?
- How are emotional regulation and executive functions related in adolescents?

2. Materials and Methods

The study was directed from a quantitative approach of correlational analysis because it describes, conceptualizes and characterizes the role of emotional regulation in the development of executive functions (Domínguez, 2015; Hernández y otros, 2014). A non-experimental research design was applied. The type of research determined is cross-sectional, given that the sample data collection is performed at a certain point in time (Domínguez, 2015). In addition, a type of non-probabilistic intentional sampling by convenience was established, characterized by the intentional selection of a group of individuals who meet the selected criteria, under inclusion and exclusion criteria, so that they meet the specific characteristics for the development of the study.

2.1 Participants and materials

The study considered adolescents aged 14 to 17 years from the province of Guayas, Ecuador. A total of 105 adolescents completed the inclusion criteria, including informed consent from their guardians, willingness to participate and having participated in all the proposed questionnaires (Table 1).

2.2 Sample selection process

The selection of the sample was carried out in three phases, which are detailed below:

The study proposal was submitted from the Academic Committee of the Master's Degree in Psychology to the Vice Rectorate of Research and Graduate Studies. The proposal considered the Institution's code of ethics and the protocol of the International Code of Ethics of the Declaration of Helsinki where the ethical criteria and informed consents were described. The study was approved according to the guidelines of the Academic Committee and the Vice-rectorate of Research and Graduate Studies with code: MaePsicoNeuro01.

The sample was selected according to the following inclusion criteria: Ecuadorian nationality, being a student at an educational center, adolescents between 14 and 17 years of age, not having a disability, participating voluntarily and presenting informed consent.

Measurement instruments were applied: a drive link was shared with adolescents whose guardians agreed to their sons or daughters participating in the study.

2.3 Instruments

Emotional Regulation Questionnaire (ERQ)

The Emotional Regulation Questionnaire (Table 2), is an instrument developed by Gross and John in 2003 with the purpose of assessing emotional regulation strategies in adolescents aged 12 to 18 years. Gullone and Taffe (2012) conducted a study in which it was obtained that the cognitive reappraisal factor has a Cronbach's alpha of 0.83 points, and the expressive suppression factor of 0.75 points. It was concluded that, the instrument presents adequate internal consistency, construct validity and convergent validity, constituting a measurement instrument with adequate psychometric properties (Navarro Saldaña et al., 2021).

Table 2. Emotional regulation strategies in adolescents

Levels	Cognitive Reassessment		Emotional Suppression	
	n	%	n	%
Low	10	9,5%	7	6,7%
Medium	47	44,8%	41	39%
High	48	45,7%	57	54,3%
Total	105	100%	105	100%

EFECO Scale for Executive Functions in Self-report Format.

The EFECO scale, is an instrument developed and validated by Garcia (2015), which poses an ecological assessment of executive functions such as cognitive flexibility, monitoring, emotional control, inhibitory control, initiative, working memory, organization of materials and planning (Ramos et al., 2016; Ramos et al., 2017) propose the validation and adaptation of the EFECO scale for the adolescent population in the educational setting, through the exhaustive review of experts who conducted the linguistic study relevant to each item to adapt it to the Ecuadorian context in a self-report version.

The evaluation of the internal consistency of this instrument consisted of an analysis of Cronbach's alpha coefficient, so that this construct is validated by evidencing a coefficient $\alpha=.95$, which affirms that the instrument meets an adequate parameter of reliability. In the construct validity analysis, it was found that the two-factor model of executive function presents better adjustment indexes (López Cárdena y Ramos Galarza, 2020).

3. Results

The data collected in the study were analyzed in the SPSS statistical program, by means of which it was performed:

Analysis to determine the reliability of the assessment instruments, same that evidences an index of $\alpha = 0.959$ for the EFECO scale and $\alpha = 0.852$ for the ERQ, which implies high reliability and internal consistency. A descriptive analysis (Table 3) of the study variables to identify the emotional regulation strategies presented by the adolescents and to analyze the performance of their executive functions, by means of cut-off points that establish low, medium and high levels of these. Hierarchical Cluster Analysis Multivariate Analysis.

Table 3 Descriptive Statistics

Variables	Mean	Standard Deviation	Variance
Cognitive Reevaluation	30,50	7,349	54,002
Emotional Suppression	20,07	5,549	30,794
Monitoring	17,34	5,002	25,016
Inhibition	18,41	5,036	25,360
Cognitive Flexibility	11,61	2,874	8,260
Emotional Control	13,17	3,859	14,893
Planning	13,00	3,698	13,673
Organization of materials	14,08	4,456	19,860
Initiative	17,96	5,931	35,172
Working memory	18,87	5,344	28,559

For the description of the data of the normalized variables, a multivariate cluster statistical analysis was developed in order to identify groups that share similar characteristics; cluster analysis (Figure 1) brings together different multivariate techniques with the objective of grouping objects according to their characteristics. The

resulting clusters according to this analysis should show a high level of homogeneity within the cluster and a high level of heterogeneity outside the cluster (Álvarez Cáceres, 1994), the SPSS hierarchical clustering procedure reports all the steps performed in the analysis, so it is easy to see which elements or clusters have merged at each step and how far apart they were when they merged. This makes it possible to assess the heterogeneity of the clusters. This section presents that the adolescents are classified into three groups or 3 clusters characterized by the use of emotional regulation strategies.

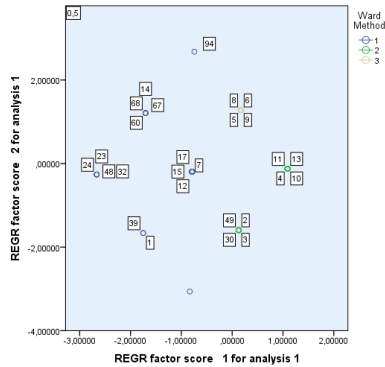


Figure 1. Hierarchical Cluster Analysis.

Table 4 KMO and Bartlett's test

KMO and Bartlett's test			
Kaiser-Meyer-Olkin measure of sample adequacy.			
Kaiser-Meyer-Olkin.			0,5
Bartlett's test for sphericity	Approximate	Chi-square	17,956
		gl	1
		Sig.	0

The KMO index is used to compare the magnitudes of the observed multiple correlation coefficients with the magnitudes of partial correlation coefficients (Alvarez, 1995). When the value of the index is low, less than 0.5, the application of the analysis is discouraged, since the correlations between pairs of variables cannot be explained by the other variables. The closer the KMO index is to 1, the more appropriate is the use of factor analysis. The test result shows the KMO index = 0.5 > 0.05. Then it does make sense to perform a factor analysis,

Table 5 Prueba ANOVA de 2 factores.

2-factor ANOVA		Sum of squares	gl	Root mean square	F	Sig.
Reevaluation (Grouped)*	Inter-group	20,119	1	20,119	85,884	,000
	Inter-group	24,129	103	,234		
Ward Method	Total	44,248	104			
Suppression (Grouped)*	Inter-group	22,019	1	22,019	124,809	,000
	Inter-group	18,171	103	,176		
Ward Method	Total	40,190	104			

ANOVA and post-hoc tests will allow us to verify that the cluster analysis carried out for the different variables is correct, in the sense of being able to verify the existence of significant differences between the groups considered. The results shown below confirm the goodness of fit of the analysis.

Table 6 Correlational Analysis of Variables

		R. Cog	Em.Sup	Monitoring	Inhibition	Cog Flex	Cont. Emo	Planning	O_of_mat	Initiative	Working memory
R. Cog	Corr.Pearson	1									
	Sig. bilateral)										
Em. Sup	N	105									
	Corr.Pearson	,607**	1								
	Sig.(bilateral)	,000									
Monitoring	N	105	105								
	Corr.Pearson	,295**	,160	1							
	Sig. bilateral)	,002	,104								
Inhibition	N	105	105	105							
	Corr.Pearson	,212*	,086	,722**	1						
	Sig.(bilateral)	,030	,383	,000							
Cog Flex	N	105	105	105	105						
	Corr.Pearson	,268**	,023	,743**	,786**	1					
	Sig. bilateral)	,006	,813	,000	,000						
Cont. Emo	N	105	105	105	105	105					
	Corr.Pearson	,320**	,092	,617**	,743**	,700**	1				
	Sig. bilateral)	,001	,353	,000	,000	,000					
Planning	N	105	105	105	105	105	105				
	Corr.Pearson	,315**	,120	,712**	,743**	,814**	,666**	1			
	Sig.(bilateral)	,001	,221	,000	,000	,000	,000				
O_of_mat	N	105	105	105	105	105	105	105			
	Corr.Pearson	,251**	,033	,690**	,763**	,785**	,683**	,704**	1		
	Sig. bilateral)	,010	,739	,000	,000	,000	,000	,000			
Initiative	N	105	105	105	105	105	105	105	105		
	Corr.Pearson	,287**	,049	,726**	,751**	,774**	,671**	,753**	,719**	1	
	Sig. bilateral)	,003	,621	,000	,000	,000	,000	,000	,000		
Working memory	N	105	105	105	105	105	105	105	105	105	
	Corr.Pearson	,296**	,120	,804**	,775**	,798**	,733**	,780**	,763**	,810**	1
	Sig. bilateral)	,002	,224	,000	,000	,000	,000	,000	,000	,000	
	N	105	105	105	105	105	105	105	105	105	105

Note: R. Cog (Reevaluation cognitive); Em. Sup (Emotion suppression); Cog. Flexibility (Cognitive); Org_of materials (Organization of materials)

According to the results of the univariate descriptive analysis of emotional regulation strategies in adolescents, emotional suppression, which refers to inhibiting emotions, is found at high average levels (93.3%). Likewise, cognitive reappraisal, referring to the ability to reinterpret a situation, is found at high average levels (90.5%). The study sample resorts to the strategies of emotional suppression and cognitive reappraisal to regulate their emotions.

The performance of executive functions in adolescents is evident Inhibition, referring to regulating one's own behavior, is found at high average levels (78.1%). Cognitive flexibility, referring to the ability to adapt easily, is found at medium-high levels (76.2%). Initiative, referring to the ability to undertake a task, is found at medium-high levels (74.3%). Planning, referring to the planning of goals, is at medium-high levels (73.4%).

Working memory, referring to the ability to maintain information, is at medium-high levels (71.5%). Monitoring, referring to habitually checking the execution of a task, is at medium-high levels (70.5%). Emotional control, referring to modulating the emotional response, is found at medium-high levels (65.8%). The organization of materials, referring to the order of work, is at medium-high levels (65.7%). Thus, it is established that the executive functions of the sample studied present a medium-high performance.

The results indicate a positive relationship between emotional regulation strategies and executive functions. This implies that, with a significance level of (0.01), when there are high levels in the cognitive reappraisal strategy, there is a greater development in the components of emotional control (,320**), planning (,315**), working memory (,296**), monitoring (,295**), initiative (,287**), cognitive flexibility (,268**) and organization of materials (251**). Meanwhile, with a significance level of (0.05), when there are low levels in the cognitive reappraisal strategy, there is a greater development in the inhibition component (,212*).

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Table 7 Chi-square test: Emotional regulation and executive functions.

	Chi-Square Test	Value	df	Asymptotic significance (bilateral)
Cognitive	Pearson's Chi-square	15, 329 ^a	4	,004
Reevaluation	Likelihood ratio	17, 257	4	,002
and Emotional	Linear by linear association	10, 809	1	,001
Control	N of valid cases	105		

4. Discussion

The purpose of the study is to identify those emotional regulation strategies used by adolescents and the development of executive functions. The results show that adolescent's resort to emotional suppression at a medium-high level (93.3%), followed by a (90.5%) cognitive reappraisal strategy, indicating that they prefer not to express emotions or find it difficult, this may be due to changes that are generated in adolescence or by other types of variables such as parenting, academic level, etc. (Guzmán González et al., 2016). This is in contrast to the study by de (Navarro Saldaña y otros, 2021), who indicate in their study that adolescents frequently use cognitive reevaluation as a strategy for emotional regulation in a natural way, this makes the individual's behavior have the competencies to solve a type of conflict in the face of a negative situation. In a study conducted in adult population in Argentina, according to their results they obtained, that the percentile scores finding significant differences according to sex, where women have a tendency with the cognitive reappraisal strategy and men with the expressive suppression strategy. (Augerot et al., 2018) have conducted a similar study but with the application of another questionnaire of Cognitive Emotional Regulation - CERQ, in which consisted of identifying the strategies of emotional regulation according to sex in the population of 13 and 16 years old in Argentina, where it was evidenced that females use the cognitive strategies of positive focus, reinterpretation and relocation in the plans by males employ the strategy of positive focus. In Colombia, a study of emotional regulation strategies associated with pathologies was conducted, as a result, where there is a relationship between post-traumatic stress with the strategies of suppression of

thoughts, ruminations and worry and compulsion obsession related to cognitive reevaluation, punishment strategy, worry (González et al., 2017). It is important that the types of emotional regulation strategies, used in moments of difficult situations, highlight cognitive reappraisal as one of the favorable strategies in the life of adolescents, which allows them to reevaluate the situation and make better decisions (González et al., 2017; Meléndez et al., 2020; Puigbó et al., 2019).

The results of the research showed a significant relationship (0.05) between the emotional regulation strategies of cognitive reappraisal with the executive functions where they present a correlation in the component of emotional control (.320**), planning (.315**), working memory (.296**), monitoring (.295**), initiative (.287**), cognitive flexibility (.268**) and organization of materials (.251**), working memory (.296**), monitoring (.295**), initiative (.287**), cognitive flexibility (.268**) and organization of materials (.251**), showing that when there are low levels in the cognitive reappraisal strategy, there is a greater development in the inhibition component. A study in Argentina, "Función ejecutivas y regulación la emoción", with a sample of 9 to 12 years old, applying a methodology with a quantitative approach, cross-sectional design and correlation, with a type of probability sampling by convenience, fulfilling the objective of our study, finding a significant relationship between working memory, cognitive flexibility, and inhibitory control with cognitive reappraisal, showing that, the higher the level of cognitive flexibility, and inhibitory control, the higher the levels of cognitive reappraisal (Andrés y otros, 2016).. A similar study where it was conducted with a population of adolescents between 12 to 18 years old, the following result was obtained, where it was verified that emotional regulation strategies possess a relationship in a significant way with executive functions, where they concluded that those adolescents who know how to manage or manage their emotions use cognitive reappraisal, and those who do not have a good management of their emotions, use expressive suppression (Lantrip et al., 2015).

Executive functions are involved in the performance of emotional regulation in adolescents, as a result it was shown from the study, that the strategy of cognitive reappraisal, possess a relationship between the different executive functions such as: inhibition, cognitive flexibility, initiative, planning, working memory, monitoring, emotional control, organization of materials, had medium high levels in the implication, where each of the executive functions, have a specific function when applying cognitive reappraisal as a strategy (Guzmán González et al., 2016; Augerot et al., 2018).

5. Conclusions

Emotional regulation is a mechanism for identifying, expressing and regulating emotions in the face of a given experience, and therefore plays a fundamental role in the performance of executive functions. The multivariate analysis determined that emotional regulation is a predominant factor in the development of executive functions in Ecuadorian adolescents, so that the following conclusions are drawn:

With respect to the objective about identifying emotional regulation strategies, it was finalized that, in this sample of adolescents, both cognitive reappraisal and emotional suppression maintain high average levels. This refers to the fact that, on some occasions, adolescents prefer to reinterpret the way they experience a situation; however, at other times, they may choose to suppress their emotions. It can be pointed out that this is due to the individual's capacity to activate mechanisms that allow him to modify his emotional expression and response in order to adapt to his environment.

With reference to the analysis of the performance of executive functions, it was concluded that the components of inhibition, cognitive flexibility, initiative, planning, working memory, monitoring, emotional control and organization of materials present

high average levels, reaching an optimal development for the age of the sample studied. This indicates that they have developed the ability to regulate their behavior, adapt to their environment, undertake an activity, plan goals, retain information, check the execution of a task, modulate their emotional response and organize their work. This is explained by the maturation of the prefrontal cortex reached during adolescence.

As for the relationship between emotional regulation and executive functions, a significant correlation between both variables is evident. Thus, high levels in the cognitive reappraisal strategy represent a greater development in the components of emotional control, planning, working memory, monitoring, initiative, cognitive flexibility, organization of materials and inhibition. Specifically, when adolescents wish to increase positive emotions, it is easier for them to be focused; when faced with stressful situations, they organize themselves, propose solutions and maintain study habits; by changing their way of thinking, it is easier for them to focus and maintain their study habits. In short, when the individual is able to reinterpret an experience to counteract its emotional impact, he or she is intervening in the development of executive functions.

Finally, and according to the multivariate analysis, it was concluded that the development of executive functions depends on emotional regulation strategies, specifically, emotional control depends on cognitive reappraisal. It should be noted that this is due to the fact that cognitive reappraisal favors cognitive control of both the individual's emotional expression and response.

According to the findings of this study, it is important to consider that future research should address components of emotional intelligence as part of the process of intrapersonal management of adolescents to minimize the effects of anxiety and depression. Likewise, similar characteristics should continue to be explored in other age groups considering variables such as educational levels, parenting styles and others that could contribute to the science of emotions and their relationship with academic, professional and family performance.

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