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Difference Between The Scores Of The Variable Emotional Intelligence According To The Sex In The Students Of 8th, 9th And 10th Grade Of A Public Institution

Diferencia Entre Las Puntuaciones De La Variable Inteligencia Emocional Según El Sexo En Los Estudiantes De 8°, 9° Y 10° De Una Institución Pública

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Attention to emotions, emotional clarity, school education, emotional intelligence, emotional repair, biological sex, mental health.

ABSTRACT

The main objective of this study was to analyze the differences in emotional intelligence scores among students of different grades in a public institution in Cucuta, according to their biological sex. A quantitative approach with a non-experimental design was adopted and a stratified random sampling with proportional allocation was applied. The questionnaire used was the Trait Meta-Mood Scale (TMMS-24) Colombian version, and the data were analyzed using SPSS 29.0. The results revealed that female students showed greater attention to emotions compared to their male counterparts, with 44.0% and 38.6%, respectively. In addition, male students exhibited greater emotional clarity (29.8%) compared to female students (21.3%). In terms of emotional repair, 61.4% of male students demonstrated adequate emotion repair compared to 28.0% of female students. As a conclusion, it can be said that biological sex seems to be related to differences in the dimensions of emotional intelligence in students. Females tend to pay more attention to emotions, while males show greater emotional clarity and capacity for emotional repair.

Palabras Claves:

Atención a las emociones, claridad emocional, educación escolar, inteligencia emocional, reparación de las emociones, sexo biológico, salud mental.

RESUMEN

El objetivo principal de este estudio fue analizar las diferencias en las puntuaciones de inteligencia emocional entre estudiantes de diferentes grados en una institución pública en Cúcuta, según su sexo biológico. Se adoptó un enfoque cuantitativo con un diseño no experimental y se aplicó un muestreo aleatorio estratificado con afijación proporcional. El cuestionario utilizado fue el Trait Meta-Mood Scale (TMMS-24) versión colombiana, y los datos se analizaron utilizando SPSS 29.0. Los resultados revelaron que las estudiantes femeninas mostraron una mayor atención a las emociones en comparación con sus contrapartes masculinas, con un 44,0% y 38,6% respectivamente. Además, los estudiantes masculinos exhibieron una mayor claridad emocional (29,8%) en comparación con las estudiantes femeninas (21,3%). En cuanto a la reparación emocional, el 61,4% de los estudiantes masculinos demostraron una adecuada reparación de las emociones, en comparación con el 28,0% de las estudiantes femeninas. Como conclusión, se puede decir que el sexo biológico parece estar relacionado con las diferencias en las dimensiones de la inteligencia emocional en los estudiantes. Las mujeres tienden a prestar más atención a las emociones, mientras que los hombres muestran una mayor claridad emocional y capacidad de reparación emocional.

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Introduction

In the educational field, emotional intelligence (EI) has become a topic of great importance. According to the Ministry of National Education-MEN (2017), the introduction of emotional education is a special measure aimed at mitigating various problems that are prominent in schools. These problems include student dropout, bullying, violence in the school environment, and more. In addition to counteracting these problems, emotional education also aims to prevent obstacles in the learning process and improve academic achievement.

It is evident that these mentioned risk factors can have a negative impact on both the physical and mental health of students, which could increase the likelihood of developing psychological disorders such as anxiety and depression (Puertas Molero et al., 2020).

Globally, anxiety and depression disorders among adolescents have experienced a 25% increase in prevalence, according to the World Health Organization (WHO, 2022). A previous survey conducted in Latin America and the Caribbean in 2020 revealed that 8,444 adolescents and young people reported anxiety symptoms in 27% of cases and depression symptoms in 15% (UNICEF, 2020). In the specific context of Colombia, in the city of Cúcuta, worrying mental health figures were recorded: 57% anxiety, 35% depression and 8% suicide (Alcaldía de San José de Cúcuta, 2020).

For this reason, in recent years, emotional intelligence (EI) has become a central theme of numerous investigations, this being understood as the ability to recognize, understand and manage one's own emotional development as well as that of others (Ariza-Hernández, 2017).

In the educational context, cultivating adequate emotional intelligence involves developing skills to strengthen and manage emotions, which in turn contributes to improving coexistence in the school environment, academic performance, informed decision making and understanding of the environment around us (Puertas Molero et al., 2020).

However, when difficulties arise in the identification and regulation of emotions, various consequences can be generated in the school environment. These consequences can manifest themselves in problematic behaviors in the classroom, such as disruptive behaviors. Among these behaviors are verbal or physical aggression, non-compliance with rules and lack of participation in school activities.

These actions have the potential to create a disruptive environment for the individual learning process and affect other students in a negative way (Quirama & Mosquera Gonzáles, 2018). From this, it can be concluded that emotional intelligence plays a fundamental role in promoting a healthy educational environment and in the comprehensive development of students.

Background

In the following section, relevant research related to the topic addressed in this study is presented. The selection of these studies was based on criteria such as the population, the instrument used and the variables examined.

Gallegos & López (2020), in their study "Motivation and emotional intelligence in high school. Differences by sex", analyzed the level of emotional intelligence and motivation in high school students aged between 12 and 17 years. In addition, they explored the differences in variables according to the sex of the students. They used a quantitative approach methodology and descriptive analysis, with a sample of 464 high school students belonging to four public schools in the region. For data collection, the instruments "Trait Meta-Mood Scale" and "Sport Motivation Scale-II" were applied.

The results indicated that a large proportion of the participants showed deficiencies in terms

of adequate emotional intelligence values and that they were self-determinedly motivated in a specific subject. In relation to gender, it was observed that males showed high levels of self-determined motivation, while females stood out for their high emotional attention ($p<.0001$). The main conclusion was that women possess greater emotional awareness, competence in recognizing their feelings and better identification compared to men.

On the other hand, Angulo et al. (2023) examined the relationship between emotional intelligence and academic performance, as well as possible differences according to sex and family type. The sample consisted of 214 adolescents aged 14 to 17 years. The research was based on a quantitative correlational approach, with a non-experimental and cross-sectional design, using non-probabilistic convenience sampling. The Trait Meta-Mood Scale 24 was used, and the results indicated that no correlation was found between the two variables. However, sex differences were identified, specifically in the emotional perception dimension. Women's scores were higher than men's, whereas, in the emotional regulation dimension, men obtained high scores.

Finally, Valenzuela-Aparicio et al. (2023) conducted the research entitled "Relationship of emotional intelligence and bullying in adolescents", where the connection between emotional intelligence and bullying was explored in 141 ninth and tenth grade students of an institution in the capital of Norte de Santander. The sample was distributed with 68 male and 73 female students, and the TMM-24 scale and the bullying assessment according to Avilés & Elices (2007) were applied. The methodology adopted was quantitative approach, non-experimental design and correlational scope, with systematic probability sampling. The results revealed a relationship between the dimensions of emotional clarity and emotional repair, and allowed understanding that those students who have difficulties in understanding and regulating their emotions, usually lack the resources to face bullying situations and seek help.

This research highlights the importance of emotional intelligence in various educational contexts, from motivation and academic performance to its relationship with bullying, and also offers a slightly broader and more complete perspective of how emotional skills can come to influence students' lives and how these gender differences can also play a significant role in these aspects.

Theoretical Bases

In order to achieve a complete understanding of the present research, the variable object of study has been defined and is described below:

Emotional intelligence (EI): according to the approach proposed by Salovey & Mayer (1990 cited by Rincón & Rodríguez, 2018) emotional intelligence is defined as a set of diverse dimensions that converge in an ability that a person possesses to understand and manage their own emotions. This ability encompasses the capacity to regulate and adjust emotions according to individual needs.

Within this model, the TMMS-24 instrument is divided into the following dimensions:

Emotional Attention: this dimension involves initial emotional perception, i.e., the ability to identify and feel emotions both in oneself and in others in an adequate manner (Salovey & Mayer, 1990).

Emotional clarity: This dimension assesses the perception and understanding of one's own emotional states, allowing for greater clarity in the interpretation of emotions (Salovey & Mayer, 1990).

Emotional regulation: This dimension measures the perception and capacity to modify emotional states, as well as the evaluation of the strategies

used to effect such modification (Salovey & Mayer, 1990).

Relationship Of Emotional Intelligence With Biological Sex

From the perspective of neuroanatomy, emotions have an important anchorage in the amygdala, a subcortical structure located in the medial temporal lobe that plays a fundamental role in the involuntary processing of emotional expressions in men and women (Silva, 2008).

In terms of the division of the cerebral hemispheres (left and right), it has been observed that women tend to show greater emotional expression. This is attributed to the fact that their information processing is mainly centered in the right hemisphere, which is more involved in emotional functions. In contrast, in men, greater connectivity is found between both hemispheres, with one focused on linguistic aspects and the other on emotional processing (De la Serna, 2017).

Emotional Intelligence In Adolescence

According to Erik Erikson's theory of psychosocial development, emotional intelligence in adolescence can be understood through its developmental stages. In the Identity vs. Role Confusion stage, which occurs during adolescence (ages 12 to 18), young people explore both their personal and social identity.

This includes the formation of a self-image, the definition of values, beliefs and goals, and this is where emotional intelligence plays an essential role in this stage, as it involves the ability to explore and understand one's own emotions, and to establish healthy relationships with others. Successful identity development at this stage is characterized by a clear understanding of who they are and what they aspire to in life (Erikson, 2000).

Materials and Methods

In this research project, a quantitative paradigmatic approach was adopted, which is based on the collection and analysis of numerical data and focuses on previously defined variables (Tamayo, 2015). In addition, a descriptive and comparative approach was used. The research design adopted was non-experimental, since there was no manipulation of variables, but rather an observation in a natural environment (Hernández Sampieri et al., 2014). Within the category of non-experimental designs, the cross-sectional study was selected, which involves data collection at a single time point (Hernández Sampieri et al., 2014).

The study population consisted of adolescent students, both female and male, belonging to a public educational institution located in the city of Cúcuta, Norte de Santander. The population was restricted to eighth, ninth and tenth grades, with a total of 164 students.

An initial sample of 116 students was planned. However, it is relevant to highlight that in several groups a greater participation was observed, therefore, instead of eliminating the additional samples, it was decided to include them in the analysis. Thus, the effective sample of students who participated in the application of the instrument was 132 students. This adjustment in the sample size made it possible to reach a confidence level of 99%.

Table I. Calculation Of The Optimum Sample Size

Calculation of the optimal sample size	
Maximum permissible margin of error	5,0%
Population size	164
Size at 95% confidence level	116
Size for a 97% confidence level	122
Size for a 99% confidence level	132

Following the previously determined sample size calculation, the stratified random sampling technique with proportional allocation was used. In this method, the population was divided into subgroups, highlighting in particular the grades and sexes present in these two subgroups: subgroup 1 (male) and subgroup 2 (female). This division resulted in the formation of a total of 10 strata.

The use of stratified random sampling with proportional allocation made it possible to take into account the different sex and grade proportions present in the student population. This stratified sampling technique is used when subgroups are identified in the population that have particular characteristics that may influence the results. By proportionally assigning an adequate number of participants from each stratum, it ensures that the sample is representative and that the results can be generalized with greater confidence to the entire population.

Table II. Stratified Random Sampling With Proportional Allocation

Stratum	Subgroup	Proportion	Stratum sample	Collected
1	Female 8°2	12,2%	14	14
2	Female 8°3	12,2%	14	18
3	Female 9°4	12,2%	14	19
4	Female 10°2	7,9%	9	11
5	Female 10°3	9,1%	11	13
6	Male 8°2	8,5%	10	10
7	Male 8°3	10,4%	12	13
8	Male 9°4	10,4%	12	13
9	Male 10°2	9,8%	11	11
10	Male 10°3	7,3%	8	10
		100,0%	116	132

Instrument

A characterization form specifically designed to collect demographic data was used. On the other hand, the Trait Meta-Mood Scale (TMMS-24) was used to assess emotional intelligence. This instrument originated from the reduced version of the Trait Meta-Mood Scale-48 developed by Salovey et al. (1995) and later adapted by a research team from the University of Malaga in Spain, led by the authors Fernández et al. (2004). The reduced version consists of three dimensions and a total of 24 items, which are scored on a Likert-type scale, similar to the original instrument.

This tool has been validated in its Spanish version, and has been demonstrated in previous studies in Colombia, where Uribe & Gómez (2008) used it in their research. The reliability of the scale, measured through Cronbach's Alpha coefficient, is considerably high, with a value of 0.927. In turn, in the three dimensions that make up the instrument, a solid internal consistency of 0.90 is observed for the emotional attention dimension, 0.90 for the emotional clarity dimension and 0.86 for the emotional repair dimension.

The choice of the Trait Meta-Mood Scale (TMMS-24) as an instrument to assess emotional intelligence is based on its previous adaptation and validation, both internationally and in the Colombian context. Its robustness in terms of reliability and internal consistency supports the soundness of the measurements to be obtained in this research. The use of validated and reliable instruments is essential to ensure the quality and reliability of the data collected and, ultimately, to support the conclusions and findings of the study.

Table IV. Variable System

Variable	Operational Definition	Dimensions	Typology of Variable	Indicators
Emotional Intelligence	Trait Meta-Mood Scale (TMMS-24)	Attention to emotions (Perception)	Scale	1-8
		Emotional clarity (Understanding)		9-16
		Emotional repair (Regulation)		17-24

Data Analysis

It was carried out through the use of two main computer tools: the Statistical Package for Social Sciences (SPSS 29.0) program, which was used to manage and analyze the data, and Microsoft Excel, which was used to create tables. In addition, following the established methodology, the range of the mean was calculated and the hypotheses were tested by applying the Mann-Whitney U Test (Méndez et al., 2018).

The use of technological tools such as SPSS and Microsoft Excel allowed efficient and accurate management of the data collected in the study. Regarding the Mann-Whitney U Test, its choice is based on its suitability for comparing two independent groups in terms of their means and distributions, especially when the data do not follow a normal distribution. This test is applied in the context of the hypotheses raised in the study, allowing us to verify whether there are significant differences in the emotional intelligence variable between the sex groups.

Results And Discussion

Demographic Data

The sample consisted of 132 students, whose ages ranged from 11 to 18 years. Regarding the demographic characteristics of the data (see Table V), it is revealed that 29.6 % (n=39) of the students were under 13 years of age, while the age group between 14 and 16 years represented 67.4 % (n=89). On the other hand, the remaining 3.1 % (n=4) corresponded to students between 17 and 18 years of age. In relation to the distribution by grade, it is observed that the eighth grade led the participation with 41.7% (n=55), followed by the tenth grade with 34.1% (n=45), while the ninth grade registered the lowest participation rate, with 24.2% (n=32).

In terms of gender, the analysis indicates that 56.8 % (n=75) of the participants were female, while 43.2 % (n=57) were male. In relation to the socioeconomic variable "stratum", it was observed that stratum 3 was the most represented, with 50.8 % (n=67), followed by stratum 2 with 21.2 % (n=28). In addition, stratum 4 contributed 15.2% (n=20) of the total sample. In the last two places of participation are strata 1 and 6, with a contribution of 11.4 % (n=15) and 1.5 % (n=2) respectively.

Table V. Demographic Data Characteristics

Data Total		Count	%
Age	11	1	0,8%
	12	11	8,3%
	13	27	20,5%
	14	35	26,5%
	15	32	24,2%
	16	22	16,7%
	17	3	2,3%
	18	1	0,8%
Grade	Eighth	55	41,7%
	Ninth	32	24,2%
	Tenth	45	34,1%
Gender	Female	75	56,8%
	Male	57	43,2%
Stratum	1	15	11,4%
	2	28	21,2%
	3	67	50,8%
	4	20	15,2%
	6	2	1,5%

Continuing with the description of the demographic variables, the results presented in Table VI are as follows:

Regarding the variable "type of family", the prevalence of the nuclear family stood out, which represented 52.3% (n=69) of the cases. In second place was the mononuclear family with 23.5% (n=31). The extended family ranked third with 16.7% (n=22) and, finally, the reconstituted family had a representation of 7.6% (n=10) among the participants. No students belonging to adoptive families were identified.

On the other hand, analyzing the variable "number of siblings", the highest percentage, equivalent to 27.3% (n=36) of the students, indicated having 2 siblings. A 25.0% (n=33) stated having 3 siblings, followed by 19.7% (n=26) who stated having 1 sibling. In addition, 12.9% (n=17) of the students mentioned having no siblings (0 siblings), and 15.1% (n=20) indicated having 4 or more siblings.

Regarding the variable "Number of children", it was noted that 56.8% (n=75) were in the first position (oldest child), while 26.5% (n=35) were in the second position. On the other hand, 12.9% (n=17) were in the third position, and the remaining 3.8% (n=5) identified themselves as the fourth child in the family.

In relation to the number of years in the educational institution, it is observed that 90.9% (n=120) of the students reported having been between 1 and 5 years in the institution. The 11 to 15 years was reported by 3.0% (n=4), while only 2.3% (n=3) mentioned having been between 6 and 10 years in the institution.

Regarding the variable "number of years lost", 66.7% (n=88) of the participants reported not having lost academic years. On the other hand, 24.2% (n=32) indicated having missed one year, while 9.1% (n=7) reported having missed 2 or 3 years.

Table VI. Characteristics Of Demographic Data

Data Total		Count	%
Type of family	Nuclear	69	52,3%
	Extensive	22	16,7%
	Single parent	31	23,5%
	Reconstituted	10	7,6%
	Adoptive	0	0,0%
Number of siblings	0	17	12,9%
	1	26	19,7%
	2	36	27,3%
	3	33	25,0%
	4	12	9,1%
	5	6	4,5%
	6	2	1,5%
Number of children I am with	1	75	56,8%
	2	35	26,5%
	3	17	12,9%
	4	5	3,8%
Number of years in the institution	0	5	3,8%
	1 to 5 years	120	90,9%
	6 to 10 years	3	2,3%
	11 to 15 years	4	3,0%
N° of years lost	0	88	66,7%
	1	32	24,2%
	2	11	8,3%
	3	1	0,8%

Results Of The Emotional Intelligence Instrument According To Biological Sex

In reference to Table VII, in the dimension related to attention to emotions, it was possible to analyze the evaluation of 75 female students. In this group, it was found that 48.0% (n=36) of the participants showed low attention to emotions, while 44.0% (n=33) showed adequate attention to this emotional aspect. In a lower percentage, 8% (n=6) of the students indicated paying excessive attention to emotions.

On the other hand, as for the 57 male students who were evaluated, it is observed that 50.9% (n=29) of them exhibited low attention to emotions. A 38.6% (n=22) of the male students demonstrated adequate attention to emotions, while 10.5% (n=6) indicated excessive attention to emotions.

Based on these results, it can be inferred that the male gender tends to pay less attention to emotions compared to the female gender. In contrast, female students presented an attention considered adequate towards emotions.

Table VII. Dimension Attention To Emotions And Biological Sex

Attention to emotions	Female	%	Male	%
Presta poca atención	36	48,0	29	50,9
Adecuada atención	33	44,0	22	38,6
Presta demasiada atención	6	8,0	6	10,5
Total	75	100	57	100

Then, when examining Table VIII and considering the level of Emotional Clarity, it is found that, in the case of the female sex, 76.0% (n=57) showed the need to improve their emotional clarity. In contrast, 21.3% (n=16) showed an emotional clarity considered adequate, while 2.7% (n=2) showed an excellent level of emotional clarity.

In relation to the male sex, 66.7% (n=38) of the participants indicated the need to improve their emotional clarity. Next, 29.8% (n=17) of the male group exhibited emotional clarity rated as adequate.

Therefore, it can be deduced that, with regard to the dimension of emotional clarity, the female sex shows a tendency towards the need to improve this emotional ability. In contrast, the male sex shows a prevalence of emotional clarity considered adequate.

Table VIII. Emotional Clarity And Biological Sex

Emotional Clarity	Female	%	Male	%
Improve your emotional clarity	57	76,0	38	66,7
Adequate emotional clarity	16	21,3	17	29,8
Excellent emotional clarity	2	2,7	2	3,5
Total	75	100	57	100

In Table IX, when considering the dimension of Emotion Repair, the following results are observed:

For the female gender, 68.0% (n=51) of the participants demonstrated a need to improve their ability to repair emotions. In addition, 28.0% (n=21) indicated having an adequate ability to repair emotions, while 4.0% (n=3) of the female students manifested an excellent ability to repair emotions.

On the other hand, as for the male gender, 31.6% (n=18) of the participants acknowledged that they should improve their emotion repair skills. In contrast, 61.4% (n=35) of male students reported adequate emotion repair ability. At a higher level, 7.0% (n=4) of male students demonstrated excellent emotion repair skills.

These results suggest that, with regard to the Emotion Repair dimension, the male gender appears to be in a more favorable position compared to the female gender. This is reflected in the higher scores obtained by male students in terms of their ability to repair emotions in an adequate manner.

Table IX. Emotion Repair Dimension And Biological Sex.

Emotional repair	Female	%	Male	%
Improving your emotional repair	51	68,0	18	31,6
Adequate emotional repair	21	28,0	35	61,4
Excellent emotion repair	3	4,0	4	7,0
Total	75	100	57	100

Hypothesis Contrasting

This is followed by nonparametric hypothesis testing focused on the verification of statistically significant differences in the analysis.

In this case, the nonparametric approach implies that certain specific distributions of the data are not assumed, which makes it suitable for situations where parametric assumptions are not met.

The search for significant statistical differences is essential to determine whether the observations made in the study are the result of chance or whether there are substantive relationships between the variables analyzed.

Table X. Hypothesis Testing

Hypothesis testing summary	Null Hypothesis	Test	Decision
1	The distribution of Attention to emotions are the same in the Sex variable.	Mann-Whitney U test for independent samples	Reject H0.
2	The distribution of Emotional clarity is the same in the Sex variable.	Mann-Whitney U test for independent samples	Reject H0.
3	The distribution of Emotion repair is the same across gender.	Mann-Whitney U test for independent samples	Reject H0.

To understand the information presented in Table XI, it is essential to consider the following:
Dimension 1 (D1): Attention to emotions.
Dimension 2 (D 2): Emotional clarity.
Dimension 3 (D 3): Emotional repair.

When analyzing the results derived from the application of the Mann-Whitney U Test (as shown in Table XI), a difference of statistical significance was found between the female and male variables in relation to the dimensions of Attention to emotions (p0.00), Emotional clarity (p0.01) and Repair of emotions (p0.00).

This statistical analysis made it possible to identify significant patterns in the behavior of sex with respect to the different dimensions of emotional intelligence. It stands out that women show a greater tendency to pay attention to emotions, with a rank of 75.45, compared to men who presented a rank of 56.04 in this dimension. On the other hand, men exhibit greater emotional clarity, with a rank of 75.57, as opposed to women whose rank in this dimension was 59.61. In the Emotion Repair dimension, men register a higher level of ability with a rank of 78.97, in contrast to women who obtained a lower rank of 57.02.

Table XI. Analysis Of Descriptive Statistics Of The Mann-Whitney U-Test On The Dimensions Of Emotional Intelligence And Sex.

	Female Male			Female Male		
Mann-Whitney U test	(D 1)	(D 2)	(D 3)	(D 1)	(D 2)	(D 3)
Range of the mean	74,4	59,6	57,0	56,0	75,5	78,9
Contrast statistic	1,54	2,65	2,84	1,54	2,65	2,84
Asymptotic significance	0,00	0,01	0,00	0,00	0,01	0,00

The main objective of this study was to determine the differences in the scores of the emotional intelligence variable as a function of biological sex among 8th, 9th and 10th grade students in a public educational institution in Cúcuta, Norte de Santander. The sample consisted of 132 participants. According to sociodemographic data, 56.8% (n=75) of the participants were female, while 43.2% (n=57) were male. In terms of academic grade, the distribution was as follows: 41.7% (n=55) corresponded to eighth grade students, 24.2% (n=32) to ninth grade and 34.1% (n=45) to tenth grade.

The results showed statistically significant differences in the different dimensions of emotional intelligence, divided between the two biological sex subgroups, i.e., group 1 male and group 2 female. In line with the stated hypotheses, the null hypothesis (H0) was rejected in all cases, leading to

the acceptance of the alternative research hypotheses (H1), (H2) and (H3).

These findings underline the importance of considering biological sex when assessing emotional intelligence in students of different academic grades.

A similar phenomenon was observed in the results obtained in the research conducted by Azpiazu and colleagues (2022), in which discrepancies were observed in the scores of the emotional intelligence instrument. In line with this, it was evidenced that female participants exhibited higher levels in the Emotional Attention dimension compared to male adolescents. In contrast, male participants showed higher scores in the Emotional Clarity and Emotional Repair dimensions.

Likewise, similarities were identified with the findings made in the research conducted by Torres and his team (2020). In their study, significant differences were found in the Emotional Attention dimension, which turned out to be more pronounced in students from rural areas (0.091). Similarly, a greater presence of this dimension was observed in the female sex compared to the male sex. It is important to note that, despite these differences, all scores in both populations were considered adequate.

In addition, it was found that, in the first dimension of the emotional intelligence variable in relation to sex, female students presented adequate attention to emotions, representing 44.0% (n=33), in contrast to male students who obtained a percentage of 38.6% (n=22). A study related to these results was conducted by Saucedo and coworkers (2019), where it was observed that women tend to grant greater attention to their feelings compared to men. In another study, conducted by Gallegos and Lopez (2020), it was found that women exhibited a higher level in the emotional attention dimension ($p<.0001$).

In this line of thought, it can be concluded that women have a greater awareness of their emotions, possess more developed competencies in recognizing their own feelings and demonstrate a superior ability in emotional identification compared to men. Similar results to those mentioned above were also found in the research conducted by Gutiérrez (2020), in which differences were identified in the dimension of emotional attention. This research concluded that women exhibit a greater ability to perceive more easily both their own emotions and the emotions of others.

Thus, through the analysis of neuroanatomy in relation to emotions, Silva (2008) found that the amygdala, a subcortical structure located in the medial temporal lobe, plays an essential role in the automatic processing of emotional expressions in individuals of both sexes, women and men. As far as sex differences are concerned, research such as that of the cerebral hemispheres (left and right) reveals that women exhibit a greater manifestation of emotions. This phenomenon arises because women process information more prominently through the right hemisphere, which is known for its strong involvement in emotion-related functions. In contrast, in the case of men, there is a greater connection between both hemispheres, where one focuses on linguistic aspects and the other on emotional processing (De la Serna, 2017).

The results obtained in this research, particularly in the dimension of emotional attention and the higher scores in the female sex, support and align with previous findings based on neuroanatomy and differences in emotional processing between men and women.

In relation to the emotional clarity dimension, both women, with 76.0% (n=57), and men, with 66.7% (n=38), presented the need to improve their emotional clarity. However, when analyzing the scores obtained in this dimension according to sex, it was observed that in the male group there was an adequate emotional clarity in a percentage of 29.8% (n=17), while in the female group this percentage

was 21.3% (n=16). Comparing these findings with the research conducted by Saucedo and colleagues (2019), it was found that 62.7% of the participants needed to improve the clarity of their emotions. Within this group, 52.1% were female and 47.9% were male. Consequently, it is suggested that men tend to exhibit adequate emotional clarity compared to women.

An additional study, conducted by Azpiazu et al. (2022), also supports these results by finding that men obtained higher scores on the emotional clarity dimension, with a mean (M) of 26.62% and a standard deviation (SD) of 6.35%. These results reinforce the trend observed in the present investigation, indicating greater emotional clarity in the male sex compared to the female sex.

An additional study, conducted by Azpiazu et al. (2022), also supports these results by finding that males obtained higher scores on the emotional clarity dimension, with an average (M) of 26.62% and a standard deviation (SD) of 6.35%. These results reinforce the trend observed in the present investigation, indicating greater emotional clarity in the male sex compared to the female sex.

From a theoretical perspective, it has been noted that the increased size of the corpus callosum and anterior commissure in the female brain has been cited as support for the notion that females possess a greater ability to understand emotions. This suggestion implies that the female brain may have circuitry genetically predisposed toward empathy, whereas the male brain may be more inclined toward analysis, exploration, and system building (Molero et al., 2020). Furthermore, in terms of cognitive development, it is relevant to note that adequate emotional understanding is also influenced by age. The stage of adolescence, in particular, is considered critical in this regard, as interactions and social skills play a vital role in the process of improving emotional understanding as maturity is reached (Cantero, 2019).

Focusing on the last dimension, it was found that 68.0% (n=51) of women needed to improve their ability to repair emotions, compared to 61.4% (n=35) of men who showed adequate emotional repair. These results resemble research findings by Azpiazu and colleagues (2022), who observed that men scored higher on the emotional repair dimension. This relates to the ability of individuals to regulate their own emotional states effectively and to understand them. Furthermore, the study by Angulo et al. (2023) also supports these results, as they identified that the male sex exhibited elevated scores on emotion regulation.

From a broader theoretical perspective, Paul MacLean's triune brain theory highlights the crucial role of the limbic system as the "second brain," which plays essential roles in emotional processes and emotion regulation. In addition, this brain structure also plays a fundamental role in attributing emotional meaning to social events occurring in the environment, which may be related to the observed differences in emotional repair between sexes (Gonzalez, 2015).

Conclusions

Historically, females have been recognized for showing a higher degree of concern in relation to emotional care. In particular, it is noted that female adolescents tend to be more emotionally focused and reflective in their approach to managing their feelings compared to male students. This focus on emotional intelligence is reflected as a set of beliefs that people have about their own ability to process emotionally charged information. According to the results obtained in this research, the following conclusions can be drawn:

The general objective of the research was oriented to determine if there are differences in the scores of the emotional intelligence variable in relation to the sex of the students. The sociodemographic data revealed that 56.8% of the participants were female, while 43.2% were male.

Likewise, they were distributed in the different grades, with 41.7% in eighth grade, 24.2% in ninth grade and 34.1% in tenth grade. The sample ranged in age from 11 to 18 years.

On the other hand, the comparison of the dimensions of emotional intelligence by gender proved to be significantly different. Female participants showed adequate attention to emotions, while male participants presented adequate emotional clarity and emotional repair. This led to the acceptance of the alternative hypotheses put forward, demonstrating that the distributions of emotional intelligence scores vary by sex.

Ultimately, based on the data collected, it can be concluded that the developmental period of adolescence in high school students has an influence on how they perceive emotional intelligence. Furthermore, the possibility is raised that these results are a consequence of the cognitive-emotional changes that occur due to the brain and psychosocial development specific to the sample studied.

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