Vol. 32, No. S1, 2025
ISSN: 1972-6325
https://www.tpmap.org/

Open Access

INTERPERSONAL RELATIONS IN SCHOOL AND THEIR INCIDENCE IN ADOLESCENT ANXIETY: A MULTIVARIATE ANALYSIS

ELKA JENNIFER ALMEIDA MONGE
UNIVERSIDAD ESTATAL DE MILAGRO
EMAIL: ealmeidam@unemi.edu.ec, ORCID: https://orcid.org/0000-0001-8507-5949

HOLGUER ESTUARDO ROMERO URREA
UNIVERSIDAD ESTATAL DE MILAGRO
EMAIL: hromerou@unemi.edu.ec, ORCID: https://orcid.org/0000-0002-0877-0339

EDMUNDO YANGUELY ZEA MOREIRA
UNIVERSIDAD ESTATAL DE MILAGRO
EMAIL: ezeam@unemi.edu.ec, ORCID: https://orcid.org/0000-0003-3482-5628

GLADYS EUGENIA LINDAO GÓMEZ
UNIVERSIDAD ESPÍRITU SANTO
EMAIL: gelindao@uees.edu.ec, ORCID: https://orcid.org/0000-0003-0132-5459

ANGIE DAYANA VILLAMAR GAVILANES
UNIVERSIDAD TÉCNICA ESTATAL DE QUEVEDO
EMAIL: avillamar@uteq.edu.ec, ORCID: https://orcid.org/0000-0003-2473-8766

MARÍA NOEMÍ ALCHUNDIA MENDOZA
UNIVERSIDAD ESTATAL DE MILAGRO
EMAIL: malchundiam@unemi.edu.ec, ORCID: https://orcid.org/0000-0002-5619-3660

Abstract
Adolescence is a critical stage in the formation of the individual, marked by physical, psychological, and social changes. Interpersonal relationships are of particular significance during this period of development, impacting not only the process of socialization, but also the mental well-being of individuals. Anxiety disorders, for instance, have been observed to be particularly prevalent among adolescents, with the quality and nature of their relationships with peers, families, and the environment contributing to the exacerbation of these symptoms. This study aims to examine the impact of interpersonal relationships in the school context on anxiety levels in adolescents between the ages of 14 and 17. A sample of 790 secondary school students was examined using two instruments: the Questionnaire for the Assessment of Interpersonal Difficulties in Adolescence (CEDIA) and the Social Anxiety Scale for Adolescents (SAS-A). The findings of the study suggest a substantial correlation between interpersonal challenges and anxiety levels, underscoring the significance of recognizing and addressing these factors in preventive interventions aimed at fostering adolescent emotional well-being.
Keywords: interpersonal relationships, anxiety, adolescents, socialization, mental health

Vol. 32, No. S1, 2025
ISSN: 1972-6325
https://www.tpmap.org/

INTRODUCTION

Adolescence is a transitional stage that encompasses fundamental changes in the biological, psychological, and social aspects of the individual (Pérez et al., 2023). During this period, adolescents undergo an intensive process of searching for identity, independence, and group affiliation, which influences the quality of their interpersonal relationships (Silva Diverio, 2007). These relationships, encompassing interactions with peers, family, and society at large, play a pivotal role in the social and emotional development of adolescents, thereby influencing their personality and future behavior (Martínez González et al., 2018).

According to socialization theory, adolescents are not only influenced by their social environment, but also actively respond to it, shaping their behavior according to social and personal expectations (Simkin & Becerra, 2013). In this context, interpersonal relationships assume particular significance, as adolescents constantly seek acceptance from their peers and social recognition, factors that are directly linked to their self-esteem and emotional well-being (Vázquez Iglesias, 2015).

However, interpersonal relationships do not always have a positive effect; factors such as social criticism, fear of negative evaluation, and difficulties in social interaction can generate high levels of anxiety in adolescents, affecting their ability to relate to others appropriately (Samaniego & Buenahora, 2016). Anxiety, defined as an emotional response to stimuli perceived as threatening, can manifest itself in various forms, including physiological, cognitive, and behavioral symptoms (Gaeta González and Martínez-Otero Pérez, 2014). Chronic anxiety can result in the development of disorders such as social phobia, which impose substantial limitations on an adolescent's social and academic life (Mardomingo Sanz, 2005).

Research into the relationship between interpersonal difficulties and anxiety in adolescents has revealed that a lack of adequate social skills and a lack of family support can increase the risk of developing anxiety disorders (Orgilés et al., 2012). Studies have shown that adolescents with social phobia face significant challenges in areas such as relationships with the opposite sex, public speaking, and maintaining healthy family relationships (Méndez, Inglés, & Hidalgo, 2002).

Conversely, secure attachment, cultivated in childhood through robust and stable family relationships, has been shown to serve as a protective factor against anxiety, promoting social adaptation and positive emotional development in adolescents (Camps-Pons et al., 2014). This form of attachment fosters the development of trust in oneself and in others, thereby promoting the establishment of healthy interpersonal relationships. These relationships, in turn, contribute to the reduction of anxiety levels (Bowlby, Attachment and Loss - 1. Attachment, 1998).

THEORY OF INTERPERSONAL RELATIONSHIPS

The emotional and social development of adolescents is influenced by interpersonal relationships. In 1969, John Bowlby established the theoretical framework of Attachment Theory, which posits that the emotional bonds formed during early childhood, predominantly with primary caregivers, exert a profound and enduring influence on the development of interpersonal relationships and emotional regulation. The attachment styles that develop in childhood, such as secure, anxious, or avoidant, have been shown to significantly impact adolescents' perceptions of and interactions with others, potentially influencing their self-esteem, social skills, and vulnerability to mental health challenges (Masapanta Solís y Núñez Núñez, 2022).

Extensive research indicates that adolescents who have developed a secure attachment style, characterized by trust in others and the ability to seek emotional support, are more likely to acquire strong social skills (Masapanta Solís y Núñez Núñez, 2022). These skills enable them to establish meaningful connections with their peers, communicate effectively, resolve conflicts constructively, and consequently, confront the challenges and anxieties associated with adolescence with greater resilience (Mikulincer & Shaver, 2019).The theoretical foundation of interpersonal relationships originated from the pioneering investigations into social interaction. Kurt Lewin, with his concept of the "psychological field," was a pioneer in the study of how people perceive and respond to their social environment. According to Lewin, an individual's behavior is determined by the dynamic interaction between the person and their immediate environment, which includes other individuals and social groups. This perspective underscores the pivotal role that interpersonal relationships play in shaping subjective behavior and experience (Moran Cuastumal y Ortiz Cerón, 2020).

In recent decades, the field of interpersonal theory has undergone significant expansion and refinement, with contributions from diverse theoretical frameworks (Moran Cuastumal y Ortiz Cerón, 2020):

- **The Attachment Theory:** As mentioned above, this theory helps to understand how early attachment experiences affect relationships throughout life. Researchers such as Mikulincer and Shaver (2019) have expanded on this idea by examining associations between attachment styles and various aspects of adulthood, such as job satisfaction and mental health.
- **The theory of social interdependence:** Proposed by Kelley and Thibaut (1978), this theory emphasizes the reciprocal nature of interpersonal relationships and how individuals evaluate the costs and benefits of interactions.
- **The theory of self-perception:** This theory proposed by Bem (1972) suggests that people infer their attitudes and feelings by observing their behavior in social situations.
- **Social neuroscience:** This new discipline allows us to study the neural mechanisms underlying social interactions and reveals the importance of brain regions such as the amygdala and the prefrontal cortex in detecting and responding to social cues.

THE ROLE OF INTERPERSONAL RELATIONSHIPS IN ADOLESCENT ANXIETY

In adolescence, anxiety is a complex emotion that can manifest itself in a variety of ways. Recent research indicates that interpersonal relationships are an important factor in the cause and expression of anxiety. Insecure attachment styles of adolescents, which are characterized by ambivalence or avoidance, have higher levels of social anxiety and have more difficulty establishing and maintaining satisfying relationships. These results highlight the importance of early relationships in the development of mental health during adolescence (Ein-Dor et al., 2017).

- **Family relationships:** The quality of family relationships has been identified as an important factor in the risk of developing anxiety in adolescence. Feelings of insecurity, low self-esteem, and anxiety can be caused by frequent family conflicts, authoritarian or neglectful parenting styles, and poor communication (Caguana Sopa y Tobar Viera, 2022)
- **Relationships with peers:** Friendships are essential for the social and emotional development of young people. Positive relationships with peers can provide social support, boost self-confidence, and relieve stress. However, experiences of isolation, bullying, or social rejection can increase the risk of developing anxiety disorders (Resset, 2016)
- **Online social networks:** The use of social networks has changed the way adolescents interact and relate to each other. Social platforms can help people connect socially, but they can also cause anxiety, loneliness, and feelings of social comparison (Twenge, 2017).

The Impact of Interpersonal Relationships on Anxiety

Recent studies have begun to elucidate the pivotal function of interpersonal relationships in the development of adolescent mental health. A mounting body of scientific evidence underscores the pivotal impact of the quality of social relationships among peers, family members, and other affiliated groups on young people's emotional well-being. Longitudinal studies have demonstrated that the quality of interpersonal relationships during adolescence can serve as a predictor of mental health in adulthood. This suggests that enhancing social connections during this period of development may have a positive impact on long-term psychological well-being.(Luo et al., 2021)

Longitudinal studies, such as one by Cohen, Janicki, & Williams (2021), have demonstrated that adolescents who perceive positive and supportive relationships with their peers and family members tend to report significantly lower levels of anxiety, depression, and other mood disorders. These findings lend support to the hypothesis that social support functions as a protective factor against the psychological risks associated with adolescence.

Conversely, the poor quality of relationships has been consistently associated with poorer mental health. Research conducted by Keller, Smith, & Lewis (2022) has demonstrated that young individuals grappling with feelings of loneliness, social isolation, or recurrent interpersonal conflicts are more prone to exhibiting symptoms of anxiety, behavioral alterations, and challenges in adapting to their environment. The underlying mechanisms that give rise to these adverse effects are multifaceted and may include, but are not limited to, chronic activation of the hypothalamic-pituitary-adrenal (HPA) axis, reduced production of oxytocin (a neurotransmitter implicated in social

bonding), and altered patterns of brain activity. The areas implicated in reward and emotion regulation (Guarín Corredor, 2022).

MULTIVARIATE ANALYSIS OF INTERPERSONAL RELATIONSHIPS AND ANXIETY

Multivariate analysis is an indispensable tool in modern psychological research, especially when complex relationships between multiple variables are discovered. As Tabachnick & Fidell (2023) have noted, this statistical approach is of value in the domain of interpersonal research, as it enables the concurrent examination of the effects of different dimensions of social experience. Beyond simple bivariate correlations, multivariate analysis facilitates the modeling of more complex causal relationships and the identification of patterns of interaction that may be overlooked in less sophisticated analyses.

According to García and Martínez (2023), their research pioneered the use of multivariate analysis to elucidate the intricate interrelationships between diverse types of interpersonal relationships and anxiety experiences. By analyzing the influence of factors such as family relationships, friendship, and the quality of social interaction, the authors attained a more precise and detailed understanding of the mechanisms underlying this phenomenon.

Their findings revealed a common pattern: negative family relationships, characterized by constant conflict, lack of emotional support, or dysfunctional communication, have a significantly more negative impact on people's psychological well-being, manifesting themselves in elevated levels of anxiety. Conversely, positive social interactions outside the family unit, such as friendships and fulfilling romantic relationships, have been shown to act as protective factors, mitigating the adverse effects of familial challenges.(Liu et al., 2020)This study underscores the pivotal role of social relationships in shaping mental health and underscores the necessity to address the underlying factors of anxiety comprehensively. According to García and Martínez (2023), enhancing our comprehension of the psychosocial mechanisms that contribute to anxiety entails considering the simultaneous influence of multiple social factors.

The emotional well-being of adolescents is significantly influenced by their interpersonal relationships. Evidence suggests that fostering healthy relationships may serve as an effective method of reducing anxiety in this demographic. To further explore the intricacies of this relationship, additional research employing multivariate methodologies is necessary. Recent studies have indicated that positive interpersonal relationships can alleviate stress by increasing oxytocin production, a hormone associated with reducing anxiety and enhancing well-being. Additionally, the possession of robust social connections has been shown to engender feelings of belonging and social support, which, in turn, have been demonstrated to enhance self-esteem and mitigate anxiety (Heinrichs et al., 2020). The present study aims to examine the relationship between interpersonal relationships and anxiety levels in adolescents between the ages of 14 and 17. It is hypothesized that difficulties in social interactions, as well as a lack of assertiveness and fear of negative evaluation, are associated with elevated anxiety levels in this demographic. To this end, two standardized assessment instruments were utilized: the Questionnaire for the Assessment of Interpersonal Difficulties in Adolescence (CEDIA) and the Social Anxiety Scale for Adolescents (SAS-A). These instruments enabled the identification of the primary domains of conflict in interpersonal relationships and their impact on the mental health of adolescents.

This study aims to contribute to the fields of psychology and education by providing evidence on the importance of fostering healthy interpersonal relationships and preventing the onset of anxiety disorders in adolescents through psychoeducational interventions and support programs in the school and family context.

METHOD

For the present study, a sample of 790 individuals was selected who completed a questionnaire on social anxiety and interpersonal relationships. Participants were divided into three age groups. The present research was carried out in the following institutions: San Antonio Franciscan Educational Unit, Milagro Christian Lyceum, Jerusalem Educational Unit of private support, José María Velasco Ibarra School, Vicente Anda Aguirre School, Milagro Technical School, Otto Arosemena Gómez Educational Unit, fiscal support.

Children under 14 years old (< 14 years old)

Between 14 and 16 years old

Over 17 years old (≥ 17 years old)

The sample selection procedure was executed in a random and simple manner. The inclusion criteria stipulated that the participants must be enrolled in public or private educational institutions and must be between the

ages of 13 and 17. Conversely, adolescents who were not currently enrolled in school were excluded from participation. The questionnaire was anonymous, and the data was treated under strict confidentiality rules. Participation in the study was voluntary, and respondents were free to decline or withdraw from the survey at any time.

INSTRUMENTS

In order to analyze the study variables, that is, interpersonal difficulties and social anxiety, two instruments have been selected for the purpose of evaluating the aforementioned variables. To measure the first variable, the Questionnaire on Interpersonal Difficulties in Adolescence was applied, and the second variable was measured using the Anxiety for Adolescents Scale (SAS-A).

The questionnaire on interpersonal difficulties in adolescence, also known as CEDIA in its Spanish version and as the Questionnaire of Interpersonal Difficulties for Adolescents (QIDA) in its English version, was utilized. This instrument is designed for application in the adolescent population, with a range of ages from 12 to 18 years. The instrument is composed of 36 items, which are divided into five dimensions: assertiveness, heterosexual relationships, public speaking, family relationships, and close friendships.

The assertiveness dimension (AS) encompasses behaviors such as articulating complaints in response to illogical requests, advocating for rights, and requesting information (16 items). The heterosexual relationships dimension (HR) encompasses the interactions an individual has with the opposite gender (seven items). Public speaking (PS) refers to the act of expressing oneself orally in a setting where an audience is present (five items). The family relationship (RF) dimension is intended to assess anxiety specifically related to the family context. Finally, the dimension of close friendships (A) is designed to evaluate the criticisms issued by friends (male/female) that include the expression of apologies or gratitude.

The Social Anxiety Scale for Adolescents, Spanish version (SAS-A), is a type of self-report that serves as a tool to assess the perception of adolescent social anxiety. It is composed of 18 questions distributed in three dimensions: Fear of negative evaluation / fear of negative evaluation (FNE), social avoidance and distress-new / social avoidance and distress-new.

The first scale (FNE) focuses on the concerns that young people have regarding how others evaluate them. It comprises eight items designed to assess the extent to which adolescents fear criticism or negative appraisals from their social environment. The second scale (SAD-N) analyzes the degree of discomfort that adolescents experience when facing unknown or new social contacts. This dimension includes six items that focus on the tendency of adolescents to avoid social situations due to the discomfort they generate. The third scale, termed SAD-G, quantifies the extent of general discomfort experienced by adolescents in various social interactions. This dimension comprises four items, and its purpose is to identify how young people feel in social environments in general. The quantitative analysis of the data collected employs a five-point Likert scale, thereby enabling the calculation of mean values and standard deviations. (1 = nothing, 5 = all the time).

PROCEDURE

The data collection process entailed the formulation and establishment of the questions through the question pro platform. This platform served as the repository for the study's respective information, the informed consent, and the ethical principles and Helsinki Agreement that guided the study's conduct. The questions of the questionnaires were added with their respective options, divided into sections for each of the instruments applied. Following their establishment on the platform, the questionnaires were disseminated to the participants via a link, enabling them to complete the survey (APA, 2017; Miranda-Novales y Villasís-Keever, 2019)

STATISTICAL ANALYSIS

The analysis of the data was conducted using the SPSS programs for Windows and R Studio. Prior to conducting the requisite statistical analyses, the presence of any lost data was ascertained through a frequency analysis of the variables to be utilized in the research study.

The subsequent descriptive analysis was conducted to ascertain the characteristics of the sample, thereby ensuring that each participant was duly considered in the subsequent decision-making process. In this instance, sociodemographic variables were considered.

An initial descriptive analysis was conducted to obtain information on the mean, standard deviation, and frequencies of the responses by age group. Additionally, heat maps were generated to illustrate the correlation between the tables, thereby indicating the strength of the relationship between the dimensions. To establish the association between the variables of interpersonal relationships, anxiety of adolescents, and its components, Pearson's correlation was employed.

Finally, a multivariate statistical technique, STATIS (Structuration des Tableaux à Trois Indices de la Statistique), was applied to facilitate the comparison of multiple data tables that are structurally related. The analysis was executed using the open-source statistical software RStudio Version 2024.04.2+764 (Gonzalez Narvaez et al., 2020).

RESULTS

DESCRIPTIVE DATA ANALYSIS

The following table illustrates the general characteristics of the study, which include the following demographic variables: gender, age, course, and type of institution. The results indicate that females exhibit a higher level of participation, constituting 57.1% (451) of the total, while males comprise 42.9% (339). The age range of the participants was from 12 to 17 years, with a distribution as follows: The proportion of participants in the 16-year age group was 28.8% (304), followed by the 17-year age group with 24.5% (304), the 15-year age group with 21.2% (263), the 14-year age group with 11.4% (141), the 13-year age group with 7.6% (94), and the 12-year age group with 6.5% (81).

(TABLE 1)

The following general inferences can be derived from the data presented in Table 1: the proportion of women is lower (57.1%) compared to that of men (42.9%). The most participants are in the last years of secondary education (15, 16 and 17 years old), with a significant concentration in the first year of secondary education.

There is a discernible upward trend in the number of students as they advance in their studies, with a particularly notable increase in the final years of high school. The majority of participants hail from fiscal entities (70.1%), while a smaller proportion are from private entities (29.9%).

(TABLE 2)

A comparative analysis reveals that women exhibit a marginally elevated mean score on the FNE scale (25.18) in comparison to men (23.55). The variability in FNE scores is comparable between both groups, suggesting that the variability in FNE scores is comparable between men and women.

In both scenarios (SAD_NEW and SAD_General), women demonstrated slightly higher average scores compared to men. A parallel can be drawn between the dispersion of the data in both clusters for these two differentiated variables and the dispersion of the FNE data.

The FNE, SAD_NEW, and SAD_General variables exhibited slightly elevated means in comparison to male subjects. The observed similarity in the standard deviation of both groups across all variables indicates that the dispersion of the data is comparable.

(TABLE 3)

The descriptive statistics of the FNE, SAD-N, and SAD-G dimensions in the table provide an overview of the distribution of the data obtained in this study, which includes 804 participants.

For FNE, the men is 3.041, indicating that participants have, on average, a moderate level of concern about being negatively evaluated by others. The standard deviation of 0.660 indicates that the variability in responses is not substantial, with most participants having scores that are close to the mean. The skewness, measuring -0.065, indicates a slight negative skewness, yet with an absolute value close to zero, suggesting that the symmetry is relatively good. The kurtosis of 0.095 indicates a relatively flat distribution, with a peak close to 0, resembling a normal distribution.

In the context of SAD-N (Non-generalized social anxiety), the mean score of 2.889 indicates a level of social anxiety that is slightly lower than that observed in FNE. The standard deviation of 0.724 indicates a slightly higher dispersion than that observed in FNE. The skewness, measured as 0.619, indicates a rightward tilt in the distribution, suggesting a bias towards higher scores. However, the presence of some high scores extends the right tail of the distribution. The kurtosis value of 2.686 indicates that the distribution is leptocurtic, meaning it is more concentrated around the mean with heavier tails than a normal distribution.

For SAD-G, the mean is 2.613, the lowest of the three dimensions, indicating that generalized social anxiety is lower than fear of negative evaluation and non-generalized anxiety in this sample. The standard deviation of 1.180 indicates greater variability in responses, suggesting that participants exhibit a wider range of generalized social anxiety levels. The asymmetry is 1.230, indicating a pronounced positive skew. This indicates that a greater proportion of participants have low scores (indicated by the volume on the left), while a smaller proportion have very high scores (which rise towards more positive values), resulting in the longer right tail. Kurtosis, measuring the concentration of the distribution around the mean, is found to be 3.903, indicating a leptocurtic distribution with pronounced concentration around the mean and extended tails. This suggests a reduction in the dispersion of the data, though the presence of some extreme values is evident.

TABLE 4

Tables 4 and 5 show the internal consistency by applying Cronbach's Alpha to know its reliability. The ensuing discussion will present the findings concerning the reliability of the instruments utilized in the study. Specifically, the SAS-A instrument yielded a value of 0.877. A similar procedure was followed for the CEDIA instrument, resulting in a value of .955. According to the extant literature, values greater than 0.7 are generally considered acceptable. Conversely, values exceeding 0.8 are indicative of substantial internal consistency, while values greater than 0.9 signify excellent internal consistency (Sisniegas Vergara et al., 2023; Vega Martíneza et al., 2019; Well et al., 2023).

(TABLE 5)

(TABLE 6)

A correlation, a type of statistical test that aims to measure the relationship or association between variables (Torales et al., 2017), is generally one of the most frequently used to employ the relationship between variables (Arias Molina et al., 2021).

Some authors establish a frame of reference that indicates when there is a correlation between variables (Hernández Lalinde and Peñaloza Tarazona, 2018; Tabachnick and Fidell, 2014). As Galindo Domínguez (2020) points out, the interpretation of correlation values in the context of literature is as follows: values ranging from 0.20 to 0.20 signify a very low correlation; 0.40 to 0.20 indicates a low correlation; 0.60 to 0.40 denotes a medium correlation; 0.80 to 0.60 indicates a high correlation; and 1 to 0.80 signifies a very high correlation.

(TABLE 7)

The variables of the dimensions of social anxiety were correlated with interpersonal difficulties. According to the results presented in Table 6, the variables fear of negative evaluation (EFN) exhibited a significant correlation with assertiveness, demonstrating a value of .415. Additionally, a correlation was observed between EFN and public speaking (.472), as well as between EFN and heterosexual relationships (.416). Galindo Domínguez (2020) noted a medium positive correlation or moderate correlation. Similarly, the variable social avoidance and discomfort (SAD_NEW) demonstrated a moderate positive correlation with assertiveness (.523), heterosexual relationships (.500), and public speaking (.583). Finally, social avoidance and general discomfort (SAD-G) demonstrated a moderate positive correlation with assertiveness (.484), heterosexual relationships (.461), and public speaking (.545). The correlation map between these variables is depicted in Figure 1.

(FIGURE 1)

MULTIVARIATE ANALYSIS: STATIS

The application of the STATIS multivariate technique (Plantes, 1976) facilitates the integration of multiple interrelated data tables. The utility of this technique lies in its capacity to facilitate the exploration of the dimensions of social anxiety and interpersonal relationships across diverse age groups. The three primary dimensions that will be examined are as follows: The first is the fear of negative evaluation (FNE), which is characterized by an apprehension of being judged or criticized by others. The second is non-generalized social anxiety (SAD-N), which is defined by an excessive concern about social interactions and interactions with specific individuals. The third is generalized social anxiety (SAD-G), which is characterized by a pervasive fear of social rejection or embarrassment. The application of the STATIS multivariate technique is particularly advantageous in examining the relationship between social anxiety and interpersonal relationships across different age groups. The data is categorized into three age groups: under 14 years old, between 14 and 16 years old, and over 17 years old.

This approach enables the synthesis of information from these groups, facilitating the identification of patterns and differences in the manifestation of social anxiety across age groups. The ensuing discussion will delineate the findings that emerged from this investigation, elucidating the interrelationships among the dimensions of anxiety and the disparate age groups. This analysis will be accompanied by the exposition of salient patterns and distinctions that were discerned among the study's subgroups (Abdi et al., 2012).

INTERSTRUCTURE

In the interstructure, the proximity of the lines indicates the similarity between the groups. In this instance, the lines are in close proximity, suggesting that the age groups exhibit comparable behaviors with respect to the dimensions of social anxiety examined (FNE, SAD-N, SAD-G). As depicted in Figure 2(a), the variations in anxiety levels across age groups are not as pronounced, which could imply that social anxiety is a pervasive phenomenon during various stages of adolescence. The graph of eigenvalues, located in the lower left corner, substantiates that the initial principal components manifest substantial variability in the data across the various age groups. This finding suggests that the primary characteristics associated with social anxiety can be captured by the first components of the analysis. This approach enables the compression of information, thereby highlighting the differences between age groups, though these differences are not considered to be of a significant nature. The first two components account for 99.68% of the variability in the data, indicating that these components encapsulate the vast majority of the pertinent information.

Figure 2(b) offers further insight into the contribution of each age group to the principal components, as depicted by the dispersion between Cos^2 and table weight. It was observed that the "14 to 16 years" group exhibited a higher Cos^2 value, indicating that this group contributes more strongly to the global model. This observation suggests that mid-adolescence is a period during which social anxiety is particularly salient, and that individuals of this age group have a significant impact on the primary components of the analysis. In contrast, the "<14 years" and "≥17 years" groups exhibited lower weights under these models, indicating their reduced representation in the models. This suggests that while social anxiety does have an effect, it is less significant in these younger age groups compared to adolescents aged 14 to 16.

(FIGURE 2)

COMMITMENT

As illustrated in Figure 2(a) of the commitment, the three dimensions of social anxiety are projected as follows: FNE, SAD-N, and SAD-G are represented in the space defined by the first two main components. Vectors represent these dimensions, originating at the origin and illustrating the contribution and relationship of each dimension to the main components. It is evident in Figure 2(a) that the FNE has a substantial load along this axis, indicating its strong correlation with the first component. Consequently, it plays a pivotal role in explaining the overall variability within the analysis. The SAD-N and SAD-G dimensions, while present, exhibit a reduced load in relation to the first component, suggesting a comparatively modest impact on this component in comparison to the FNE.

The second component, situated on the vertical axis, appears to play a less significant role in explaining the overall variability, as the vectors tend to align more closely with the first component. However, subtle variations in the slope of the vectors along this axis can offer more precise insights into the nuances of their inter-dimensional differences. The SAD-N and SAD-G components demonstrate a closer proximity to the negative aspect of the second component, thereby indicating an inverse relationship, both with each other and with the second component, in comparison to the FNE component, which exhibits a positive slope along this axis.

(FIGURE 3)

As illustrated in Figure 3(a), the first component emerges as the primary differentiating factor between the dimensions of social anxiety, with the FNE proving to be the most salient. In this particular instance, SAD-N and SAD-G exert a lesser influence yet maintain equal importance in elucidating the underlying relationships between the dimensions of anxiety across the designated age groups. In Figure 2(b), the cells of the matrix represent the correlation coefficients between the data tables of the various groups.

Figure 3(b) represents a vector correlation index that shows the similarity or dissimilarity with which the three age groups studied relate in their responses to the dimensions of social anxiety. The cells in the matrix are indicative of the correlation coefficients between the data tables of the various groups, with values ranging from 0.97 to 1.00, denoting a high degree of similarity between the groups.

Values outside the diagonal indicate correlations between different age groups.

The correlation between the age groups of 14 to 16 years and under 14 years is indicated by the following: 0.99, indicating a high degree of similarity between these two groups with respect to social anxiety.

A similar correlation (0.99) was observed between the 14-16 age group and the older age group, suggesting that social anxiety patterns among early adolescents (14-16 years) and those over 17 years of age are comparable.

The under-14 group and the over-17 group exhibited a correlation of 0.97, indicating less pronounced similarity in anxiety patterns between these two age groups.

A dendrogram situated at the summit of the graph illustrates the hierarchical relationship between the age groups. The 14-16 age group and the 17-and-over age group exhibit the strongest correlation at the apex of the chart, while the under-14 age group demonstrates slightly diminished correlation. This observation suggests that, in general, younger adolescents exhibit slightly greater disparities compared to the two older age groups, although the correlation remains notably high.

INTRASTRUCTURE

The intrastructure graph illustrates the relationship between the various observations within each age group that were analyzed. It demonstrates the internal connections of the tables corresponding to the groups "<14 years," "14 to 16 years," and "≥17 years." Each data point on the graph corresponds to a participant or observation within the designated age group. The distances between these points reflect the degree of similarity or dissimilarity between the observations in terms of the dimensions of social anxiety studied.

A greater dispersion of observations is evident among the under-14 age group, with some points far from the center, such as 445, 139, and 419. This finding suggests that within this group, there is a greater variability in responses related to the dimensions of social anxiety. This finding suggests the presence of heterogeneity in the manifestation of social anxiety within this specific group, indicating that levels of social anxiety may not be universally applicable to all individuals.

The 14-16 age group exhibits a higher degree of aggregation, suggesting that individuals within this age range demonstrate more homogeneous responses with respect to social anxiety-related dimensions. However, some observations do deviate from the mean, as evidenced by the outliers 684 and 689. Greater cohesion would indicate a greater level of uniformity in social anxiety characteristics among members of this group and less variation between responses.

In the group of 17 years or older, an additional minor group emerges, although certain points are slightly more distant from the center, as illustrated by the number 666, which significantly deviates from the rest. This finding suggests that, while the majority of individuals within this group exhibit similar responses to other similar cases, there are some instances where the levels of social anxiety vary.

(Figure 4)

DISCUSSION OF RESULTS

The findings of this research, which encompasses 804 participants, offer a comprehensive perspective on the FNE (Fear of Negative Evaluation), SAD-N (Non-Generalized Social Anxiety), and SAD-G (Generalized Social Anxiety) dimensions. Through meticulous examination of these dimensions, we can discern their intricate interrelationship and comprehend how they manifest in the experience of social anxiety within the population under study.

However, it is noteworthy that generalized social anxiety (SAD-G) has exhibited significant variability and a biased distribution, with a tendency towards more severe ratings. This finding suggests the presence of multiple social anxiety profiles, wherein certain individuals manifest a more dispersed and generalized variant of anxiety, extending beyond the specific concerns associated with the assessment. This heterogeneity poses a substantial challenge in defining and treating the disorder.

A comparative analysis of the three dimensions reveals that both the FNE and non-generalized social anxiety (SAD-N) exhibit comparable distribution patterns, suggesting a correlation between these dimensions. However, G-SDS is distinguished by increased variability and a higher prevalence of elevated scores, suggesting that this dimension may represent a more severe construct that is resistant to therapeutic change.

These findings bear significant implications for both theoretical and clinical contexts. From a theoretical standpoint, our findings lend support to cognitive-behavioral models that underscore the primary importance of negative convictions about oneself and negative evaluations of others in the formation and preservation of social anxiety. Furthermore, these findings underscore the necessity to broaden the scope of existing models to encompass the heterogeneity observed in the manifestation of social anxiety.

From a clinical perspective, our findings underscore the necessity of conducting personalized evaluations that facilitate the identification of the particular elements of social anxiety in each patient. This personalized approach would facilitate the implementation of therapeutic interventions that are more tailored to the specific needs of each individual. For instance, patients with a predominant fear of negative evaluation (FNE) could benefit from cognitive-behavioral methods that challenge adverse convictions about assessment and promote social competencies. Conversely, patients with more pronounced G-SAD may necessitate more rigorous interventions that address both particular concerns and generalized anxiety symptoms.

In conclusion, the findings of this research provide a relevant insight into the experience of social anxiety in a group of 804 participants. The study of FNE, SAD-N, and SAD-G revealed an intricate relationship between fear of evaluation and various manifestations of social anxiety. These findings underscore the necessity for comprehensive consideration of these factors when devising therapeutic interventions and programs, ensuring that individuals grappling with anxiety receive tailored support to address their unique needs.

In addition, the implementation of education and training programs in social skills is recommended, as these programs have the potential to contribute to a reduction in the fear of negative evaluation and an increase in confidence in social contexts. It is further recommended that future research be carried out to investigate the elements that contribute to social anxiety in different population groups, in order to guide clinical practices and create more effective interventions.

Finally, it is imperative to acknowledge that a comprehensive understanding of the dimensions of social anxiety is not only essential for the development of appropriate treatments but can also contribute to a heightened awareness of mental health and the significance of promoting inclusive and supportive social environments.

CONCLUSION

The findings of the statistical analysis suggest that, while there are slight variations among age groups in terms of social anxiety dimensions (FNE, SAD-N, SAD-G), these differences do not attain statistical significance. This finding suggests that social anxiety is not a variable phenomenon and is relatively uniform across the various stages of adolescence.

The 14-16 age group exhibits the most significant contributions to the primary components of the analysis, suggesting that during this period of mid-adolescence, the characteristics associated with social anxiety exert a more substantial influence. This group exhibits a greater degree of homogeneity in their responses, suggesting a shared lived experience among individuals within this age group.

In contrast, the groups of children under 14 and over 17 years of age exhibited a greater variability of responses. This observation may be indicative of a more diversified social anxiety profile in the older and younger groups, which could be associated with their distinct emotional development and maturation processes.

The high correlation between the three age groups, with values ranging from 0.97 to 1.00, indicates that social anxiety patterns do not vary considerably across the sample, despite some minor differences. A somewhat reduced correlation was observed among younger adolescents (aged <14 years) in comparison to the other groups. It is noteworthy that social anxiety can manifest unique characteristics during the early teenage years.

Intrastructure graphs demonstrate that, while responses are predominantly consistent within each age group, certain individuals exhibit substantially divergent levels of social anxiety compared to their peers. These exceptional cases, which may represent the upper or lower ends of the distribution, necessitate further investigation to elucidate the underlying mechanisms that give rise to such pronounced differences.

AUTHOR NOTE

The authors declare no conflicts of interest to disclose.
Correspondence concerning this article should be addressed to Angie Dayana Villamar Gavilanes at the Universidad Técnica Estatal de Quevedo, Av. Carlos J. Arosemena 38, Quevedo, Ecuador
Email: avillamar@uteq.edu.ec

REFERENCES

1. APA. (2017). Ethical Principles Of Psychologists And Code Of Conduct. https://www.apa.org/ethics/code/ethics-code-2017.pdf
2. Arias Molina, M., Ochoa Sangrador, C., & Ortega Páez , E. (2021). Correlación. Modelos de regresión. Evidencia en Pediatría, 17(25). https://evidenciasenpediatria.es/files/41-13993-RUTA/25_Fund_Correlacion_v2.pdf
3. Bem, D. J. (1972). Self-perception theory. Advances in experimental social psychology, 1-62.
4. Bowlby, J. (1969). Attachment and Loss: Volume I. Attachment. New York: Basic Books.
5. Bowlby, J. (1998). El apego y la pérdida – 1. El apego. Barcelona: Paidós.
6. Caguana Sopa, M., & Tobar Viera, A. (2022). La funcionalidad familiar y su relación con la ansiedad en adolescentes. Ciencia Latina Revista Científica Multidisciplinar, 6 (6), 10039-10053.
7. Camps-Pons, M., Castillo-Garayoa, M., & Cifre, E. (2014). El apego seguro en la adolescencia y su relación con la ansiedad social. Psicología y Salud, 25(2), 112-123.
8. Cohen, S., Janicki, D., & Williams, A. (2021). The role of social support in adolescent anxiety. Journal of Youth and Adolescence, 50(5), 919-934.
9. Ein-Dor, T., Doron, G., & Mikulincer, M. (2017). Attachment insecurity and social anxiety: A meta-analytic review. Personality and Social Psychology Review, 21(3), 232-257.
10. Gaeta González, L., & Martínez-Otero Pérez, V. (2014). Ansiedad en la infancia y la adolescencia: Factores psicosociales. Revista de Psicología Clínica, 12(1), 45-62.
11. Galindo Domínguez, H. (2020). Estadistica para no estadístico: Una guía básica sobre la metodología cuentitativa de trabajos académicos. Ciencias.
12. García, M., & Martínez, R. (2023). Análisis multivariante de las relaciones interpersonales en la adolescencia. Revista de Psicología y Salud, 12(2), 105-119.
13. Gonzalez Narvaez, M., Ruiz-Barzola , O., & Nieto Librero, A. (2020). Multivariant analysis: A tour through dimensionreduction methods. Matemática, 18(2), 1-26.
14. Guarín Corredor, C. (2022). Efecto del ejercicio físico sobre las funciones ejecutivas de niños y niñas entre los seis y once años, expuestos a experiencias adversas en la infancia: Una revisión del estado del arte. Universidad Nacional de Colombia.
15. Heinrichs, M., Baumgartner, T., Kirschbaum, C., & Ehlert, U. (2020). Social support and oxytocin: Implications for mental health. Neuroscience & Biobehavioral Reviews, 110, 141-152.
16. Hernández Lalinde, J. D., & Peñaloza Tarazona, E. (2018). Sobre el uso adecuado del coeficiente de correlación de Pearson: definición propiedades y suposiciones. Archivos Venezolanos de Farmacología y

Terapéutica, 37(5). https://www.revistaavft.com/images/revistas/2018/avft_5_2018/25sobre_uso_adecuado_coeficiente.pdf
17. Keller, M., Smith, J., & Lewis, T. (2022). The impact of peer relationships on adolescent anxiety. International Journal of Adolescent Medicine and Health, 34(1), 65-73.
18. Kelley, H. H., & Thibaut, J. W. (1978). Interpersonal relations: A theory of interdependence. Wiley.
19. Liu, Y., Wang, M., & Zhang, L. (2020). The mediating role of perceived social support in the relationship between social network characteristics and depressive symptoms among Chinese adolescents. Journal of Youth and Adolescence, 49(5), 978-989.
20. Luo, D., Hawkley, L. C., & Cacioppo, J. T. (2021). Trajectories of social connection and mental health from adolescence to young adulthood. Journal of Adolescence, 87, 106613.
21. Mardomingo Sanz, M. J. (2005). Fobia social en adolescentes: Diagnóstico y tratamiento. Psiquiatría Infantil, 47(1), 35-45.
22. Martínez González, A. E., Cándido Inglés, S., Piqueras Rodríguez, J. A., & Oblitas Guadalupe, L. A. (2018). Habilidades sociales en la adolescencia y su relación con la popularidad. Revista de Psicología Social, 18(2), 135-145.
23. Masapanta Solís, N. M., & Núñez Núñez, M. (2022). Estilos de apego y estrategias de afrontamiento en estudiantes universitarios. LATAM Revista Latinoamericana De Ciencias Sociales Y Humanidades, 4(1), 421–435.
24. Méndez, X., Inglés, C., & Hidalgo, M. D. (2002). Dificultades interpersonales y fobia social en adolescentes. Análisis y Modificación de Conducta, 28(116), 519-541.
25. Mikulincer, M., & Shaver, P. R. (2019). Attachment in adulthood: Structure, dynamics, and change. New York : Guilford Press.
26. Miranda-Novales, M. G., & Villasís-Keever, M. Á. (2019). El protocolo de investigación VIII. La ética de la investigación en seres humanos. Revista Alergia México, 66(1), 115-122. https://doi.org/https://doi.org/10.29262/ram.v66i1.594
27. Moran Cuastumal, L. V., & Ortiz Cerón, D. S. (2020). Relación entre Manejo de emocionessentimientos y Relaciones interpersonales en adolescentes escolarizados de una institución educativa del municipio de Pasto. Revista Criterios, 27(2), 45-69.
28. Orgilés, M., Johnson, C., Huedo-Medina, T. B., & Espada, J. P. (2012). Relación entre la ansiedad social y el rendimiento académico en adolescentes. Revista de Psicología Educativa, 19(3), 187-196.
29. Pérez, L., Gálvez, M., & Torres, A. (2023). Adolescencia y desarrollo psicosocial: Influencia de las relaciones interpersonales. Psicología y Educación, 29(1), 73-91.
30. Resset, S. (2016). Relación percibida con padres y pares y su asociación con ansiedad y depresión en adolescentes de Entre Ríos. Revista Argentina de Ciencias del Comportamiento, 18-26.
31. Samaniego, A., & Buenahora, M. (2016). Variables relacionadas con ansiedad social en adolescentes un modelo de regresión lineal múltiple. Interacciones, 2(2), 109-122.
32. Silva Diverio, D. (2007). Adolescencia y búsqueda de identidad: Un análisis desde la socialización. Revista de Estudios Psicológicos, 14(3), 102-120.
33. Simkin, H., & Becerra, G. (2013). El proceso de socialización. Apuntes para su exploración en el campo psicosocial. Ciencia, Docencia y Tecnología, 119-142.
34. Sisniegas Vergara, C. E., Alva Santillan, J. A., & Monteza Nevado, C. A. (2023). Assessment of the Dundee Ready Educational Environment Measure instrument modified from the peruvian version during COVID-19 pandemic. Educación Médica, 24(3). https://doi.org/10.1016/j.edumed.2023.100809
35. Tabachnick , B. G., & Fidell, L. S. (2014). Using Multivariate Statistics (Sixth Edition ed.). Pearson . https://api.pageplace.de/preview/DT0400.9781292034546_A24616694/preview-9781292034546_A24616694.pdf
36. Tabachnick, B. G., & Fidell, L. S. (2023). Using Multivariate Statistics. Londres: Pearson.
37. Torales, J., Barrios, I., Viveros-Filártiga, D., Giménez Legal, E., Samudio , M., Aquino, S., & Samudio, A. (2017). Knowledge of basic statistical, epidemiological and research methodology by medical residents from the National University of Asunción, Paraguay. EducaciónMédica, 18(4), 226-232. https://doi.org/10.1016/j.edumed.2016.06.018
38. Twenge, J. M. (2017). iGen: Why today's super-connected kids are growing up less rebellious, more anxious, less happy—and completely unprepared for adulthood. London: Atlantic Books.

39. Vázquez Iglesias, C. (2015). Relación entre habilidades sociales y bienestar emocional en adolescentes. Psicología Social y Salud, 27(2), 89-105.
40. Vega Martíneza, M., Frías Osunab, A., & Del Pino Casado, R. (2019). Validez y confiabilidad de la escala de sentido de coherencia en estudiantes de grado de enfermería de una universidad española. Sociedad Española de Salud Pública y Administración Sanitaria, 33, 310-316. https://doi.org/10.1016/j.gaceta.2018.02.009
41. Well, J., Mahendran, S., Dolgin, K., & Kayyali, R. (2023). SPUR-27 – Psychometric Properties of a Patient-Reported Outcome Measure of Medication Adherence in Chronic Obstructive Pulmonary Disease. Patient Preference and Adherence, 17, 457-472 . https://doi.org/10.2147/PPA.S394538