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ORIGINAL ARTICLE

Peer victimisation and social anxiety disorder among adolescents: The mediating role of perceived social support

Obaloluwa David Adeyemo[1], Bede Chinonye Akpunne[1], Oluwatobiloba Ajibola Okeniyi[1], Elizabeth Nkechi Akpunne[1]

[1]Redeemer's University Faculty of Social Sciences, Department of Psychology, Ede, Nigeria

ABSTRACT

Objective: This study examined the links between peer victimisation, perceived social support, and social anxiety disorder, and assessed the mediating role of perceived social support.

Method: A multi-stage sampling technique was employed to select 551 adolescents (45% male, 55% female) mean age =14.70 SD =1.76). Participants completed the Social Phobia Inventory, the Multidimensional Scale of Perceived Social Support, and the Multidimensional Online and Offline Peer Victimisation Scale. Structural equation modeling, regression analysis, independent t-tests, and one-way ANOVA were used to test the hypotheses.

Results: A 12.9% prevalence of severe social anxiety was reported by participants. Peer victimisation significantly predicted social anxiety (β=0.36, t=9.30, p<0.01) and together with perceived social support, it significantly predicted social anxiety disorder (R=0.42, R^2=0.18; F (1,543) = 19.52, p<0.01). Perceived social support did not significantly mediate the relationship between peer victimisation and social anxiety (β=0.003, t=0.038, 95% CI: -0.012 ~ 0.021, p>0.05). Female adolescents exhibited significantly higher social anxiety than males (t (551) = -4.26, p<0.01), with no significant differences found across adolescent age groups (F (2, 548) = 1.73, p>0.05).

Conclusion: The findings highlight the significant impact of peer victimisation on social anxiety, with female adolescents being particularly vulnerable. Educational administrators and policymakers should implement programs to enhance social support and address peer victimisation, with attention to gender differences in social anxiety.

Keywords: Peer victimisation, Perceived social support, Social anxiety, In-school adolescents

Correspondence: Obaloluwa David Adeyemo, Redeemer's University Faculty of Social Sciences, Department of Psychology, Ede, Nigeria **ORCID/ID:** 00009-0003-2040-5080 **E-mail:** adeyemooba321@gmail.com
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INTRODUCTION

The phenomenon of social anxiety has recently been recognised as a pervasive issue affecting individuals worldwide, with varying degrees of severity observed across different regions[1]. Social anxiety disorder (SAD) is a condition where people experience intense fear or anxiety when they face social or performance situations that could lead to negative judgments or evaluations from others, according to the DSM-5[2]. People with social anxiety often feel extremely distressed in social a setting, which is not justified by the actual danger of the situation. Common social situations that trigger such anxiety usually involve interacting, being observed, or performing in front of others, such as meeting new people, joining group conversations, talking to authority figures, eating or drinking while being watched, going to school or work, using public restrooms, and giving presentations[3]. People with SAD are afraid that they will act in a way that they consider humiliating or embarrassing (for example, blushing, sweating, looking anxious, bored, or incompetent[3,4], and as a result, they tend to avoid or endure social situations. Avoidance and safety behaviours during social interaction (such as avoiding eye contact) are characteristic of SAD and keep social anxiety alive, even though they are meant to lower the chance of embarrassment or rejection[5]. Most of the existing data on the epidemiology of SAD comes from Western high-income countries . The data from Europe and the US have shown similar patterns of high SAD prevalence and comorbidity[6]. However, some have argued that SAD might be a specific Western phenomenon[7].

Based on the work of Stein et al.[6], data from the National Study of Mental Health and Wellbeing (NSMHW) 2002-2003 Survey Initiative indicated that the prevalence of SAD in Nigerian adults (18 years and older) was 0.2%. This figure is considerably lower than the 4.0% global average. However, Stein et al.[6] also highlighted that the NSMHW report acknowledged a scarcity of reliable mental health data in Nigeria. Factors such as stigma, limited awareness, and restricted access to mental health services likely lead to underreporting, suggesting the true prevalence of SAD in Nigeria could be higher.

Stein et al.[6] further noted that SAD generally has an early onset worldwide. In Nigeria, the median age for the onset of SAD is 11 years, meaning half of those who will develop the disorder show symptoms by this age. The persistence of these symptoms was found to be longest in upper-middle-income nations and the Eastern Mediterranean region. Moreover, the study pointed out a consistent global link between SAD and various socio-demographic characteristics, including being younger, female, unmarried, having a lower level of education, and a lower income.

Peer victimisation is a form of peer abuse in which someone is repeatedly assaulted in a hostile way by peers[8]. In peer victimisation, victims do not necessarily feel a power difference between them and their assailant, and they do not always sense that their assailant wants to hurt them, which distinguishes it from bullying[9]. The prevalence rates of peer victimisation can be estimated at around 25-30%[10]. One investigation on the prevalence of peer victimisation in a Nigerian sample of adolescents, which is the population that is the focus of this study, found that 46.5% of the participants were self-reported victims[11]. Young individuals who are victimized tend to experience heightened levels of anxiety, negative emotions, feelings of loneliness and depression and harbour more self-deprecating thoughts compared to their non-victimized counterparts[12]. Childhood peer victimisation is also linked to physical health issues and externalizing problems in later life[13].

Social support is a multifaceted concept defined as the assurance from others that one is valued, loved, respected, and part of a reciprocal support network[14].

Within the ICF framework, social support is an environmental element that can influence participation. This support can be tangible, such as meals, money, or transportation to a doctor's appointment, or it can be intangible, like information, emotional support, or a sense of community[14]. Social support contributes more than just emotional wellness. Studies have shown that robust social support is associated with positive mental health[15]. Social support can be categorized into perceived and received support. Perceived support refers to an individual's belief that they have a support network they can rely on when needed. In contrast, received support refers to the actual help that an individual gets . While these two concepts are related, they represent two separate constructs. Previous research has indicated that perceived support is a stronger predictor of mental and physical health than received support[15]. Consequently, this study explores the interaction between peer victimisation, perceived social support, and social anxiety among in-school adolescents.

Adolescence, a critical developmental stage marked by significant physical, emotional, and social changes, is also a period of vulnerability where individuals are exposed to various forms of peer victimisation. Peer victimisation, characterized by experiences of bullying and aggression from peers, has been identified as a significant risk factor for the development of social anxiety in adolescents[16,17]. Peer victimisation can manifest in various forms, such as physical aggression, verbal bullying, or relational aggression[18]. The impact of peer victimisation on adolescents is profound, contributing significantly to social anxiety. This anxiety can have detrimental effects on an adolescent's psychological well-being and overall quality of life[18]. Research has consistently shown that adolescents who experience peer victimisation are more likely to develop social anxiety[19]. However, the relationship between peer victimisation and social anxiety is complex and may be influenced by various factors. One such factor is perceived social support, defined as the perception and actuality that one is cared for, esteemed, and part of a mutually supportive social network[21]. Stressors such as victimisation indirectly affect mental health by reducing perceived social support .

The theoretical framework guiding this research is the Social Support Deterioration Model (SSDM). According to this theory, stressors such as perceived stigma or traumatic events negatively affect mental health both directly and indirectly by reducing perceived social support[22,23]. The SSDM posits that the loss of supportive resources worsens the difficulties faced by individuals experiencing stressors. This theory suggests that the decline in social support is an independent risk factor for negative health outcomes, such as mental illness, beyond the direct impact of the traumatic event itself[24]. According to this theory, stressors such as perceived stigma or traumatic events negatively affect mental health both directly and indirectly by reducing perceived social support[25,26]. The SSDM posits that the loss of supportive resources worsens the difficulties faced by individuals experiencing stressors. This theory suggests that the decline in social support is an independent risk factor for negative health outcomes, such as mental illness, beyond the direct impact of the traumatic event itself[27]. Therefore, our study tests a mediation model directly aligned with the SSDM, hypothesizing that peer victimization will predict higher social anxiety, in part, by depleting adolescents' perceived social support.

Low support from parents and teachers, a diminished sense of school belonging, and high levels of peer victimisation are significant predictors of anxiety, regardless of gender[28]. Victimisation experiences influence students' perceptions of support from classmates and close friends, and in turn, these perceptions affect reports of social anxiety[20]. Despite the extensive research in Western societies, the extent to which these findings apply to the Nigerian context,

where cultural norms (such as extended family structures and communal living), social practices (like the strong influence of traditional leaders and community events), and educational systems (including disparities in access to quality education and the prevalence of informal learning environments) differ significantly, remains largely unexplored. In Ogun State, Nigeria, there is a high prevalence of adolescent issues[29]. However, comprehensive research examining the role of peer victimisation, social anxiety, and perceived social support among in-school adolescents in this region is lacking.

This research seeks to address these gaps by examining the interaction between peer victimisation, perceived social support, and social anxiety among in-school adolescents in Ogun State, Nigeria. The study aims to achieve the following objectives:

1. To identify the prevalence and pattern of social anxiety among in-school adolescents in Obafemi-Owode LGA.
2. To investigate the extent to which peer victimisation and perceived social support predict social anxiety among in-school adolescents.
3. To examine whether perceived social support mediates the relationship between peer victimisation and social anxiety among in-school adolescents.
4. To examine the influence of gender on social anxiety among in-school adolescents.
5. To analyze how early, middle, and late stages of adolescence differ in their levels of social anxiety among in-school adolescents.

Based on these objectives and a review of the relevant literature, the following research hypotheses were tested:

1. Peer victimisation and perceived social support will significantly and jointly predict social anxiety among in-school adolescents in Obafemi-Owode LGA.
2. Perceived social support will significantly mediate the relationship between peer victimisation and social anxiety among in-school adolescents in Obafemi-Owode LGA.
3. Female students will have significantly higher levels of social anxiety when compared to male students among in-school adolescents in Obafemi-Owode LGA.
4. Early adolescents will exhibit significantly higher levels of social anxiety compared to middle and older adolescents among in-school students in Obafemi-Owode LGA.

METHOD

Design

For this study, a cross-sectional research design was utilized. The survey method included self-administered questionnaires and psychological tests.

Participants

Sample size determination

The total population of secondary school students in Obafemi-Owode Local Government Area (LGA) of Ogun State was 52,558, according to the Department of Planning Research and Statistics, Ministry of Education Science and Technology in Abeokuta. This population comprised 27,300 junior secondary students (12,194 in public schools and 15,106 in private schools) and 25,258 senior secondary students (9,444 in public schools and 15,814 in private schools).

To determine the minimum required sample size, Yamane's (1967) formula was used:

$$n = \frac{N}{1 + N(e^2)}$$

Where:
n is the sample size.
N is the population size.
e is the margin of error (0.05 for a 5% margin of error).

$$n = \frac{52558}{1 + 52558(0.05^2)}$$
$$n = 397$$

The calculated minimum sample size was approximately 397 in-school adolescents. To account for potential attrition and to enhance the generalizability of the findings, 600 questionnaires were distributed.

While Yamane's formula confirmed the adequacy of the sample for survey precision, a power analysis was also conducted to ensure the sample size was sufficient for the primary inferential analyses. Using G*Power 3.1, a priori calculations were performed with standard parameters of α=0.05 and a desired power of 0.80. To detect a conventional medium effect size, the required sample was N=128 for the independent samples t-test (Cohen's d =0.50), N=159 for the one-way ANOVA with three groups (Cohen's f =0.25), and N=77 for the hierarchical regression analysis detecting an R2 increase from a single predictor (effect size f2 =0.15). Furthermore, for the structural equation model, the achieved sample of N=551 greatly exceeds the common recommendation of N >200 for stable model estimation and provides a high ratio of cases per estimated parameter. Therefore, the final sample of 600 participants was considered more than adequate, providing high statistical power (well over 0.99 for medium effects) for all planned hypothesis tests.

Sampling

A multi-stage sampling procedure was adopted for this study. In the first stage, the population of 337 secondary schools in the Obafemi-Owode LGAwas stratified into two groups based on school type: public schools (N=23) and private schools (N=314).

In the second stage, schools were selected from these strata using a disproportionate stratified random sampling method. Specifically, three public schools and three private schools were randomly selected using the random sampling function in SPSS. This disproportionate approach was intentionally chosen to ensure that the public-school sector, despite being smaller, was adequately represented in the sample of selected institutions.

In the third stage, the total number of student participants was allocated across the six selected schools. A proportionate sampling technique was used to determine the number of respondents from each school based on its student population size. Finally, in the fourth stage, individual participants within each school were selected from class lists using a simple random sampling technique. Data were collected between June 24th and July 2024.

Ethics committee approval was obtained from Redeemers' University Directorate of Research Innovations and Partnerships on 30.06.2024 with the decision number of RUN/REC/2024/212.

Research instruments

The research instruments used in this study included a socio-demographic questionnaire and three standardized psychological scales.

Socio-demographic questionnaire

A self-designed section of the questionnaire was used to collect participants' demographic and background information. This section included items assessing age (in years), gender (male/female), class level from Junior Secondary school One (JSS1) to Senior Secondary School Three (SSS3), student status (day or boarding), parental marital status (e.g., married, single, widowed), current living arrangement (e.g., with both parents, with mother only), family type (monogamous or polygamous), family size, and parental occupation (father's and mother's).

The multidimensional scale of perceived social support (MSPSS)

The Multidimensional Scale of Perceived Social Support (MSPSS)[20]. MSPSS measures perceived social support from family, friends, and significant others. It contains 12 items rated on a 7-point Likert scale. The scale is divided into three subscales, each assessing support from one of the three sources. Psychometric evaluations have shown high reliability and validity, with Cronbach's alpha coefficients of 0.88 for the total scale, 0.91 for the family subscale, 0.87 for the friend subscale, and 0.85 for the significant others subscale. Higher perceived social support correlates with better mental health outcomes, such as lower depression and anxiety levels. The MSPSS has

been validated in various cultural contexts, including Nigeria. Studies like Bello et al.[31], have confirmed its reliability and validity among Nigerian populations, reporting Cronbach's alpha of 0.93. The MSPSS's utility in psychological and social research within Nigeria is reinforced by its significant correlations with measures of mental health. For scoring, a total score is computed by aggregating responses to the 12 items. For descriptive reporting in this study, total scores were categorized into three levels based on the sample's distribution: Low (scores >1 standard deviation below the mean), moderate (scores within ±1 standard deviation of the mean), and Hhigh (scores >1 standard deviation above the mean).

The multidimensional offline and online peer victimisation scale (MOOPV)

The Multidimensional Offline and Online Peer Victimisation Scale (MOOPV)[32], assesses peer victimisation among adolescents both offline and online. It includes subscales for direct and indirect victimisation in both contexts: five direct and five indirect offline items and five direct and five indirect online items. Students rate their victimisation experiences over the past six months on a six-point scale ranging from "never" to "almost every day". Authors affirm that MOOPV demonstrated adequate internal reliability with Cronbach's alpha estimates above 0.80, and that its validity was supported by significant negative relationships between peer victimisation and psychosocial well-being[24]. The Subscales of MOOPV was reduced to five items each, ensuring the measure remains relevant as internet platforms evolve. A total score is computed by aggregating responses across all items. In this study, scores were categorized for descriptive purposes into the same Low, Moderate, and High levels using the sample mean and standard deviation.

The social phobia inventory (SPIN)

The Social Phobia Inventory (SPIN), developed by Connor et al.[33], is a 17-item self-assessment tool used to measure the severity of SAD. It covers three dimensions: fear, avoidance, and physical symptoms (e.g., trembling, blushing, heart palpitations, sweating). Each item is rated from 0 (not bothered at all) to 4 (extremely bothered), with a total score range of 0 to 68. According to the scale manual[26], these scores are interpreted as follows: 0-10 indicates an absence of symptoms; 11-20 suggests borderline or very mild social anxiety; 21-30 indicates mild social anxiety; 31-40 corresponds to moderate social anxiety; 41-50 suggests severe social anxiety; and scores of 51 and above indicate very severe social anxiety. Internal consistency of α=0.87-0.94 was reported[26,34]. The SPIN is a reliable and valid tool for assessing social anxiety severity, providing insights into fear, avoidance, and physical symptoms associated with the disorder.

Data analysis

All statistical analyses were conducted using IBM SPSS version 27 and AMOS version 28. The significance level (alpha) for all statistical tests was set at 0.05, results that met the more stringent level of $p<0.01$ were specifically highlighted to denote a higher level of statistical confidence

To test the first hypothesis regarding gender differences in social anxiety, an independent samples t-test was conducted. The second hypothesis, which examined differences in social anxiety across early, middle, and late adolescent age groups, was tested using a one-way analysis of variance (ANOVA).

To test the third hypothesis on the predictive power of the main variables, a hierarchical multiple regression was conducted. The dependent variable for this analysis was the total social anxiety score from the SPIN. The predictor variables were entered in a three-step, theory-driven process to determine the unique contribution of each block of variables. In Step 1, the demographic variables of sex and age were entered to serve as controls. In Step 2, the three subscales of the Multidimensional Scale of Perceived Social Support (family, friends, and significant others) were entered to assess the predictive power of social support. Finally, in Step 3, the total score from the Multidimensional Offline and Online Peer Victimisation Scale was entered. This final step was designed to test whether peer victimisation could explain a significant amount of additional variance in social anxiety after accounting for the effects of demographics and social support.

To test the final mediation hypothesis, a structural equation model was specified and tested using AMOS[28]. The model consisted of three latent variables: Peer victimisation (independent variable), perceived social support (mediator), and social anxiety (dependent variable). An item parcelling approach was adopted, where the subscales of each instrument served as the observed indicators for their respective latent construct. Specifically, the Peer Victimisation latent variable was indicated by the four subscales of the MOOPV: offline direct, offline indirect, online direct, and online indirect victimisation. The Perceived Social Support latent variable was indicated by the three subscales of the MSPSS: support from family, friends, and significant others. Finally, the social anxiety latent variable was indicated by the three dimensions of the SPIN: fear, avoidance, and physiological symptoms. Model fit was assessed using multiple indices, including the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root mean square error of approximation (RMSEA). The significance of the indirect mediation effect was tested using a bootstrapping procedure with 5,000 samples and 95% confidence intervals. Consistent with modern recommendations, this approach directly tests the indirect effect and does not require the constituent paths or the total effect to be statistically significant as a precondition for analysis. An indirect effect is considered statistically significant if its confidence interval does not contain zero.

Prior to this analysis, the assumption of normality was considered; given the large sample size of the study (N=600), the t-test is considered robust to violations of this assumption due to the Central Limit Theorem, making it an appropriate test for this analysis. The random sampling function within SPSS was utilized for school selection. The AMOS software was used for computing the structural equation model and its fit indices.

RESULTS

Socio-demographic data of respondents

The result of the demographic characteristics of the participants by sex showed that male was 248 (45%) while female was 303 (55%). Ages ranged from 10 to 20 years and the mean age of the participants was 14.70±1.76 years of age. Class distribution was: JSS1 (2.7%), JSS2 (9.3%), JSS3 (5.8%), SSS1 (32.5%), SSS2 (49.4%), and SSS3 (0.4%). Most (71.5%) were day students, with 28.5% boarders. Parental marital status was predominantly married (86.8%), followed by single (8%), widowed (2.5%), separated (2%), and divorced (0.7%). The majority (72.1%) lived with both parents, while 10.2% lived with their mother only, 15.2% with their father only, and 2.5% with other family/friends. Most participants (92.7%) were from monogamous families, and 7.3% from polygamous families, and family size ranged from 1 to 19 (M=5.51, SD=1.55).

A descriptive analysis was conducted to examine the patterns of peer victimisation and perceived social support among the participants. As shown in Table 1, the scores were categorized into low, moderate, and high levels based on the sample's distribution. For peer victimisation, 17.2% of adolescents reported low levels, while 17.1% reported high levels. Regarding perceived social support, 14.5% reported low levels and 15.1% reported high levels.

Result of the prevalence and pattern of social anxiety among the participants show that 15.2% reported absence of social anxiety symptoms, 16.7% had borderline social anxiety scores while 24.3% had mild social anxiety score. Furthermore, 18.3% reported social anxiety scores while 12.5 and 12.9% reported severe and very severe social anxiety scores respectively.

As shown in Table 2 an independent sample t-test was used to test the hypothesis which says that female adolescents will have higher levels of social anxiety when compared to males. Gender was made up of 248 male and 303 female participants. The result summarized in Table 2 indicated that sex had a significant influence on social anxiety [$t(551) = -4.26$, $p<0.01$]. This was such that female students (M=31.84, SD=16.71) displayed higher forms of social anxiety compared to their male counterparts (M=25.87, SD=15.92).

Table 1. Frequency distribution of participant scores on the multidimensional scale of perceived social support (MSPSS) and the Multidimensional Offline And Online Peer Victimisation Scale (MOOPV)

				Prevalence					
				Low		Moderate		High	
	N	Mean	SD	F	%	F	%	F	%
The multidimensional offline and online peer victimisation scale (MOOPV)	551	45.90	19.80	95	17.2	362	65.7	94	17.1
The multidimensional scale of perceived social support (MSPSS)	551	65.60	13.25	80	14.5	388	70.4	83	15.1

Categories were defined based on the sample distribution. Low = score < (mean - 1 SD); Moderate = score between (mean - 1 SD) and (mean + 1 SD); High = score > (mean + 1 SD).

Table 2. Independent samples t-test of gender differences in scores on the social phobia inventory (SPIN)

Dependent factors	Gender	N	Mean	SD	df	t	p
Social anxiety	Male	248	25.87	15.92	549	-4.26	<0.01
	Female	303	31.84	16.71			

SD: Standart deviation

A one-way ANOVA was performed to test the hypothesis, which stated that early adolescents would exhibit significantly higher levels of social anxiety compared to middle and older adolescents. The adolescents were grouped into three stages: early adolescence (N=121, M=28.02, SD=15.81); middle adolescence (N=400, M=29.11, SD=16.72); and late adolescence (N=30, M=34.30, SD=16.99). The analysis summarized in Table 3 revealed that there was no statistically significant difference in social anxiety levels among the three stages of adolescence, $F(2,548) = 1.73$, $p > 0.05$. This suggests that the stage of adolescence does not significantly influence the level of social anxiety among in-school adolescents.

Table 3. One-way analysis of variance (ANOVA) of social phobia inventory (SPIN) scores across adolescent age groups

Adolescent stage	N	Mean	SD
Early (10-14 yrs)	121	28.02	15.81
Middle (15-17 yrs)	400	29.11	16.72
Late (18-21 yrs)	30	34.30	16.99

ANOVA Summary: $F(2, 548)=1.73$, $p>0.05$

SD: Standart deviation, yrs: Years

Assessing the interactions between the variables

Figure 1 depicts the complex interplay between various forms of peer victimisation, perceived social support and components of social anxiety. The direct effects of offline and online victimisation (both direct and indirect) were investigated and perceived social support on three key dimensions of social anxiety: fear, avoidance, and physiological symptoms.

The analysis revealed a nuanced pattern of relationships between the predictor variables and social anxiety outcomes:

Perceived social support demonstrated non-significant associations with all three components of social anxiety: fear (β=-0.01, p>0.05), avoidance (β=-0.01, p>0.05), and physiological symptoms (β=-0.01, p>0.05). Furthermore, perceived social support had a non-significant prediction on overall social anxiety (β=-0.02, p>0.05). These results suggest that, in this particular model, perceived social support may not play a direct role in mitigating social anxiety symptoms.

Regarding offline victimisation, our analysis revealed divergent patterns between direct and indirect forms. Direct offline victimisation showed non-significant relationships with fear (β=0.05, p>0.05), avoidance (β=0.02, p>0.05), and physiological symptoms (β=0.01, p>0.05) of social anxiety. Direct offline victimisation had a non-significant prediction on overall social anxiety (β=0.80, p>0.05). In contrast, indirect offline victimisation exhibited significant positive predictions across all three social anxiety components: fear (β=0.12, p<0.01), avoidance (β=0.15, p<0.01), and physiological symptoms (β=0.08, p<0.01). Indirect offline victimisation also had a significant positive prediction on overall social anxiety (β=0.35, p<0.01).

Online victimisation demonstrated varied effects across the components of social anxiety. Direct online victimisation showed a significant positive effect on fear (β=0.14, p<0.01) and physiological symptoms (β=0.13, p<0.01), but a non-significant prediction on avoidance (β=0.06, p>0.05). Overall, direct online victimisation had a significant positive prediction on social anxiety (β=0.32, p<0.01). Indirect online victimisation exhibited significant positive predictions across all three social anxiety components: fear (β=0.11, p<0.05), avoidance (β=0.20, p<0.01), and physiological symptoms (β=0.08, p<0.05). Notably, indirect online victimisation had a positive prediction on overall social anxiety (β=0.39, p<0.01).

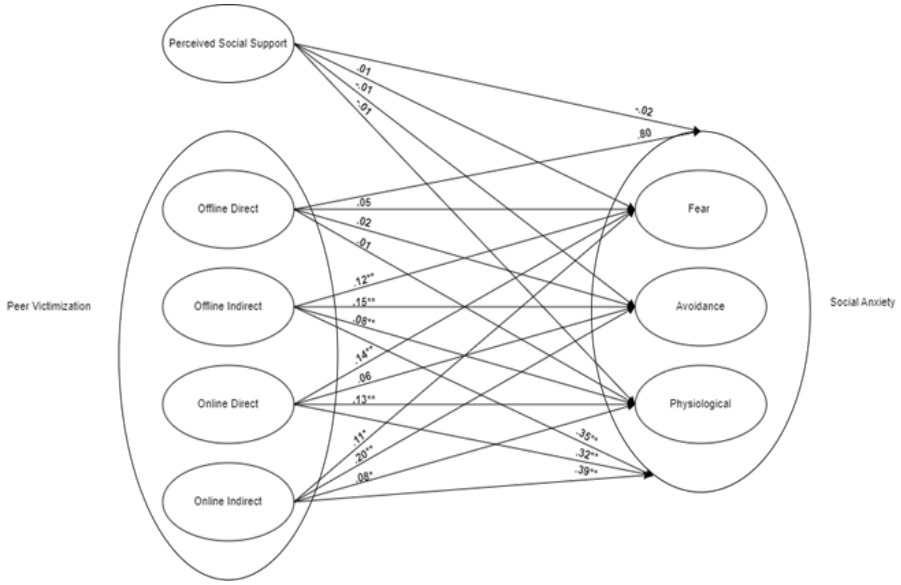


Figure 1. Model Illustration showing the association among the variables

Note: *p<0.05, **p<0.01.

As summarized in Table 4, a three-step hierarchical regression model was conducted with personal characteristics kept under control in the first step. These covariates were selected based on extensive previous research demonstrating their association with social anxiety in adolescents. This initial step allows for the effects of the primary predictors to be assessed after accounting for these fundamental demographic influences. It was indicated that sex (β=0.19, t=4.57, p<0.01) significantly predicted social anxiety while age (β=0.11, t=2.52, p>0.05) did not. The personal factors contributed a significant variance of 4% to observed changes in social anxiety among individuals [R=0.21, R^2=.04; F (2, 548) =12.36, p<0.01]. In the second step of the hierarchy, perceived social support was added. The results showed that social anxiety was not predicted by perceived social support from significant others (β=-0.04, t=-0.59, p>0.05), family (β=-0.03, t=-0.75, p>0.05), or friends (β=0.01, t=0.16, p>0.05). Thus, there was no significant contribution in step 2 [R^2=0.05, ΔR^2=0.04; ΔF=0.62, p>0.05]. In step 3, peer victimisation was added. It was noted that social anxiety increased significantly with peer victimisation (β=0.36, t=9.30, p<0.01). Jointly, the variables contributed a significant variance of 18% to the observed variance in social anxiety [R=0.42, R^2=0.18; F (1, 543) =19.52, p<0.01]. This meant that peer victimisation accounted for 17% of the variance in social anxiety [R^2=0.18, ΔR^2=0.17; ΔF=86.45, p<0.01].

Table 4. Hierarchical multiple regression analysis predicting social anxiety (SPIN) from perceived social support (MSPSS) and peer victimisation (MOOPV)

Predictors	**Step 1**		**Step 2**		**Step 3**	
	β	**t**	**B**	**t**	**β**	**t**
Sex	0.19	4.57**	0.19	4.42**	0.22	5.53**
Age	0.11	2.52	0.10	2.38	0.11	2.64
Significant other			-0.04	-0.68	-0.03	-.48
Family			-0.03	-0.69	-0.03	-.57
Friend			0.01	0.26	0.05	1.10
Peer victimisation					0.36	9.30**
R	0.21		0.22		0.42	
R2	0.04		0.05		0.18	
ΔR2	-		0.04		0.17	
Df	2, 548		3, 545		1, 544	
F	12.36**		5.30**		19.52**	
ΔF	-		0.62		86.45**	

Note: *p<0.05, **p<0.01

Table 5 is a summary of mediation analysis performed to assess the mediating role of Perceived Social Support in the relationship between Peer Victimisation and social anxiety. The bootstrapping method with 5,000 bootstrap samples was used, as suggested by Preacher and Hayes[35], to assess the size of the effect and to obtain confidence intervals and significance levels for paths. The results revealed that without the inclusion of the mediator, the effect of peer victimisation on social anxiety was significant (β=0.46, t=8.17, p<0.001). Peer victimisation had a significant positive prediction on social anxiety, which implies that an increase in peer victimisation will cause a significant increase in social anxiety among in-school adolescents. The total effect of peer victimisation on social anxiety was significant (β=0.46, t=7.67, p<0.01). There was

no significant indirect effect of peer victimisation on social anxiety (β=0.003, t=0.038, p>0.05). This shows that perceived social support does not mediate the relationship between peer victimisation and social anxiety.

Table 5. Mediation analysis of the indirect effect of peer victimisation (MOOPV) on social anxiety (SPIN) via perceived social support (MSPSS)

Relationships	Direct effect	Indirect effect	Confidence interval		p-value	Conclusion
			Low	High		
PV->PSS >SA	0.46 (8.17)	0.003 (0.038)	-0.012	0.021	0.72	No mediation
Model fit statistics: $\chi 2$=111.400, df=32, p<0.001, CFI=0.96, IFI=0.96, GFI=0.96, TLI=0.95, RMSEA =0.06 SRMR =0.34						
Note: PV: Peer victimisation, SA: Social anxiety, PSS: Perceived social support, Unstandardized coefficients reported. Values in parentheses are t-values. CI represents the 95% confidence interval for the indirect effect.						

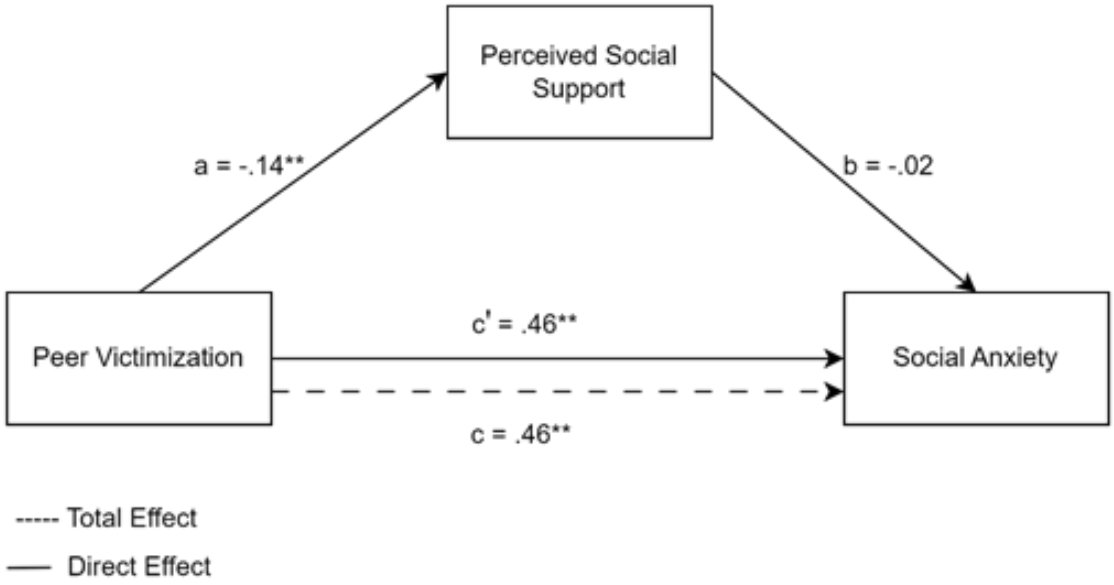


Figure 2. Path diagram showing the relationships between peer victimisation, perceived social support, and social anxiety
PV: Peer victimisation, PSS: Perceived social support, SA: Social anxiety
Path a (PV → PSS) is significant, indicating that peer victimisation significantly and negatively affects perceived social support.
Path b (PSS → SA) is non-significant, suggesting that perceived social support does not have a significant effect on social anxiety.
Paths c (total effect) and c′ (direct effect) are equal, indicating that the indirect effect is not significant; thus, full mediation is not supported.

A simple mediation analysis was conducted using structural equation modelling to test the hypothesized mediation model. In this study, the latent variables were peer victimisation, perceived social support, and social anxiety. For peer victimisation, the four subscales of the MOOPV were deemed as observable variables; for perceived social support, they were the three subscales of the MSPSS; for social anxiety, they were the three subscales of the SPIN.

The diagram illustrates that peer victimisation has a significant direct effect on social anxiety (c'=0.46**). It also shows that peer victimisation negatively impacts perceived social support (a=- 0.14**), while perceived social support has a non-significant effect

on social anxiety (b=-0.02). The total effect of peer victimisation on social anxiety remains significant (c=0.46**).

A good fitting model is accepted if the value of CMIN/DF is ≤5 it indicates a reasonable fit the goodness of fit indices (GFI) indices[37], the TLI[38], the CFI[30,39] is >0.90. In addition, an adequate fitting model was accepted if the AMOS computed value of the standardized root mean square residual (SRMR) <0.05, and the RMSEA[30] is between 0.05 and 0.08 the fit indices for the model shown in Table 4 fell within the acceptable range CMIN/df =3.48, GFI =0.961, TLI =0.955, CFI =0.968 SRMR =0.034 and RMSEA =0.067.

DISCUSSION

Peer victimisation and perceived social support jointly predicted social anxiety, aligning with previous research. Spence et al.[21], found that among 3,392 adolescents, peer victimisation, low parental and teacher support, and poor school belonging significantly predicted anxiety, even when social support was present. Similarly, Coyle et al.[20], showed that both traditional and cyber-victimisation were linked to reduced classmate support and increased social anxiety among 669 students. Victimized adolescents may internalize negative messages, heightening their fear of social interactions and reducing opportunities to build social skills. This dynamic is particularly pronounced in adolescence, where peer interactions are critical.

The final predictive model, incorporating socio-demographics, peer victimisation and perceived social support accounted for 18% of the variance in adolescent social anxiety symptoms. While modest in absolute terms, this level of explained variance is highly consistent with findings from other large-scale studies of adolescent psychopathology. For instance, recent predictive models using the comprehensive Adolescent Brain and Cognitive Development (ABCD) dataset explained approximately 15.6% of the variance in concurrent depression symptoms[40]. Similarly, a model predicting social anxiety in adolescents using a range of contextual factors reported an explained variance of 21%[41]. Our finding of thus falls squarely within the expected and scientifically meaningful range for this complex and multifactorial outcome. The fact that 82% of the variance remains unexplained underscores the profound multifactorial nature of social anxiety. This unexplained portion is likely attributable to factors not included in the present study, such as genetic predispositions, specific cognitive biases like self-focused attention[42], neurobiological variables[43], or complex gene-environment interactions that are notoriously difficult to measure. Future research should aim to build upon the current findings by integrating the predictors from our model with these other domains to construct even more comprehensive etiological models of adolescent social anxiety.

Perceived social support did not significantly mediate the relationship between peer victimisation and SAD. Previous studies have demonstrated that social support can mitigate the impact of peer victimisation on social anxiety. For instance, a study by Coyle et al.[20], found that peer victimisation affects social anxiety indirectly through reduced perceived social support. However, some research aligns with the current study's findings. For example, a study by Thoits[44] suggested that the perceived quality of social support might vary, and its effectiveness in buffering stressors like peer victimisation can be inconsistent. It posited that the perceived adequacy and availability of social support play crucial roles, which might not have been effectively captured in the current study. Additionally, research by Prinstein et al.[45], pointed out that the complex dynamics of social interactions in adolescence, including the presence of supportive but ineffective or inadequate social networks, could explain why social support did not function as a significant mediator. The relationship between peer victimisation, social support, and social anxiety might involve other mediating or moderating variables not accounted for in this study. Factors such as resilience, coping strategies, and individual differences could play significant roles in this complex interaction.

The instruments used to measure perceived social support, peer victimisation, and social anxiety might have limitations in capturing the true extent of these constructs within this specific population. Specifically, while the MSPSS has documented validation in Nigeria, the MOOPV was used without specific Nigerian adaptation and validation studies being cited. Similarly, for the SPIN, although a pilot study within this research indicated good reliability, a comprehensive cultural adaptation and validation for Nigerian adolescents may not have been established prior to its use. This lack of specific adaptation and validation for the MOOPV and SPIN in the Nigerian context should be considered a limitation, as cultural nuances could influence how items are interpreted and responded to. It's possible that the scales used did not fully reflect the participants' experiences and perceptions.

There was a significant influence of sex on social anxiety among students. Female in-school adolescents reported a higher level of social anxiety than males. The result is consistent with prior research demonstrating a connection between gender and social anxiety. One study by Zentner et al.[46], investigated the underlying mechanisms that produce culture and gender differences in social anxiety. The study found that females reported higher social anxiety than males. Females tend to report higher social anxiety levels than males, which could be attributed to societal expectations and gender roles. Societal norms often place greater emphasis on women's appearance, behaviour, and social interactions, leading to increased pressure and self-consciousness. These expectations can contribute to higher levels of social anxiety among females. Additionally, the study suggests that gender role identification plays a role in social anxiety. Individuals who strongly identify with a masculine gender role may feel pressured to conform to societal expectations of confidence and assertiveness. This pressure can lead to increased anxiety in social situations, particularly if they perceive a mismatch between their behaviour and societal expectations.
There was not a statistically significant difference in social anxiety levels among early, middle, and late adolescents. Previous studies have shown that social anxiety tends to be higher in early adolescence compared to middle and late adolescence. For instance, research by Westenberg et al.[47], indicated that social anxiety typically peaks during early adolescence due to heightened self-consciousness and social evaluation sensitivity during this period. This discrepancy could be due to contextual factors unique to the Nigerian sample. A study by La Greca and Lopez[48] found that social anxiety symptoms decreased as adolescents aged, aligning with the developmental model where early adolescents are more prone to social anxiety. However, some research aligns with the current study's findings. For example, a study by Storch et al.[49], found no significant age-related differences in social anxiety levels among adolescents. This suggests that social anxiety may not follow a straightforward developmental trajectory and could be influenced by various factors, including individual differences and environmental contexts.

Additionally, McLaughlin and King[50] reported that the differences in social anxiety levels across different stages of adolescence might not be as pronounced as previously thought, emphasizing the role of other moderating factors such as peer relationships and family dynamics. The lack of significant difference in social anxiety levels among the three age groups could be due to Nigerian socio-cultural context. Cultural norms might encourage adolescents to mask or internalize their anxiety, resulting in uniformly reported levels across different stages of adolescence. Moreover, cultural attitudes towards mental health might influence how social anxiety is perceived and reported, potentially minimizing perceived differences among age groups.

Indirect forms of victimization, both offline (e.g., social exclusion, rumor spreading) and online, demonstrated significant positive predictions across all three components of social anxiety: fear, avoidance, and physiological symptoms. Offline indirect victimization, primarily manifesting as social

exclusion and rumor spreading, involves deliberate social manipulation that can profoundly impact an individual's psychological well-being. The often-covert nature of these aggressions can be particularly insidious. Victims may internalize blame or feel helpless because the aggression is not overt and easily identifiable, making it difficult to seek support or redress[51]. The perception that peers are intentionally trying to harm one's social standing can be deeply damaging to self-worth and trust in others, fostering hypervigilance for social threats and a constant state of anticipating negative evaluation[52]. This psychological toll directly feeds into all three components of social anxiety. This suggests that the pervasive and often ambiguous nature of indirect aggression may foster a broad spectrum of social anxiety responses, possibly due to the victim's difficulty in predicting or controlling these social attacks, leading to heightened vigilance, a desire to avoid social situations, and more pronounced physical stress reactions.

In contrast, direct forms of victimization presented a more varied pattern. Direct offline victimization did not show significant relationships with any of the social anxiety components in this model, which is an intriguing finding. This could imply that perhaps isolated incidents of direct offline acts are less chronically impactful on these specific anxiety manifestations compared to the relentless nature of indirect victimization, or their effects might be captured differently. Meanwhile, direct online victimization significantly predicted an increase in fear and physiological symptoms, but not avoidance. The immediate and often confrontational nature of direct online attacks might strongly trigger fear and physiological distress; however, the lack of association with avoidance could reflect different coping mechanisms or perceived control in online versus offline social contexts, where disengagement might be an easier initial strategy than overt avoidance of all online social interaction. These differential impacts underscore the importance of considering the specific forms and contexts of peer victimization when assessing its link to various facets of social anxiety.

Limitations

This study's findings should be interpreted with consideration for several limitations. Firstly, the generalizability may be affected by the sampling procedure; stratifying at the school level within the local government, rather than initially at a broader zonal level, might not have fully captured population diversity, potentially leading to underrepresentation of some groups. Secondly, data collection logistics were influenced by requirements from some public schools for compensatory materials (e.g., books, chairs) prior to questionnaire distribution. Additionally, the reliance on self-reported measures for peer victimisation, perceived social support, and social anxiety carries a risk of response biases, such as social desirability or recall inaccuracies, which could impact data validity. Finally, the study's cross-sectional design elucidates associations between variables but cannot establish causal relationships due to the simultaneous nature of data collection. Another limitation involves the scope of the covariates used in the regression model. While age and sex were controlled for, other potentially confounding sociodemographic variables mentioned in the literature, such as socioeconomic status, parental education, or family structure, were not included in the analysis. The exclusion of these variables means that their potential influence on social anxiety was not accounted for, and future research could benefit from incorporating a broader range of social and economic factors to build a more comprehensive predictive model.

A further limitation relates to the instrumentation used. While the MSPSS has been validated among Nigerian populations, two of the other key instruments, the MOOPV and the SPIN, have not undergone formal psychometric validation for Nigerian adolescents. The absence of specific cultural adaptation and validation for these scales means that cultural nuances may have influenced how participants interpreted and responded to the items. This could potentially affect the validity of the findings related to peer victimisation and social anxiety, and the results should be interpreted with this consideration in mind.

These limitations underscore the need for cautious interpretation of the results and highlight avenues for future research, including longitudinal designs and broader sampling strategies, to enhance the robustness and applicability of findings concerning adolescent social anxiety.

CONCLUSION

In conclusion, this study found a high prevalence of social anxiety among Nigerian in-school adolescents, with peer victimisation emerging as a significant predictor of social anxiety. While perceived social support did not emerge as a significant mediator in this model, it remains an important area of focus. This non-significant finding may be due to the omission of other key variables that could also play a role, as reflected in the model's modest explained variance. It is also possible that the nature of social support is more complex than measured, with support from peers versus family potentially having different mediating effects. Additionally, female adolescents reported higher levels of social anxiety compared to males, although no significant differences were observed across the stages of adolescence. These findings suggest that schools could consider implementing anti-bullying programs and strengthening support systems, including gender-specific interventions. Given the association between victimisation and anxiety, raising awareness and promoting early identification strategies are also essential. Such measures may help to foster a healthier, more supportive school environment for all students. Future research should build on these findings by addressing this study's limitations. A longitudinal design is needed to establish the causal pathways between peer victimisation, social support, and social anxiety over time. Furthermore, future studies should incorporate a broader range of potential mediators and covariates, such as self-esteem, coping mechanisms, and socioeconomic status, to develop a more comprehensive model.

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