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## **Stress Depression and Anxiety Disorders among High School Students in Vietnam: A Cross-Sectional Study in the COVID-19 Pandemic**

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### **Abstract**

Anxiety disorder, a prevalent form of emotional disturbance, is characterized by persistent and nonspecific feelings of apprehension that significantly impair individuals' well-being and quality of life. This disorder manifests through symptoms affecting the autonomic nervous system. The incidence of anxiety disorders has notably risen during the COVID-19 pandemic, particularly from the outbreak in the 2021–2022 academic year in Vietnam. During this period, high school students faced significant challenges due to distance learning, which presented additional stressors. This situation particularly impacted high school students, especially those in their 12th grade. Thus, this study aims to investigate the associate between stress, depression, and anxiety disorders among 12th-grade Vietnamese students during the COVID-19 pandemic.

The study utilized the Depression Anxiety Stress Scales (DASS-21) to evaluate stress, anxiety, and depression levels among a cohort of 1,007 students. These participants were drawn from six provinces, representing both the Northern and Southern regions of Vietnam, ensuring a diverse and comprehensive sample.

This study indicated that a positive association between higher levels of stress and depression and the incidence of anxiety disorders among the students.

Although the study's cross-sectional methodology and the self-reported nature of the DASS-21 instrument are acknowledged as drawbacks, the findings offer valuable insights into the psychological effects of the epidemic on pupils. Notwithstanding these limitations, the study provides significant insights into the possibility of forecasting and averting the emergence of anxiety disorders among 10th-grade students in Vietnam during the period after the COVID-19 pandemic. Through a comprehensive analysis of the intricate elements that contribute to anxiety disorders, this research provides important implications for early prevention and intervention

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approaches, with the goal of tackling the mental health difficulties that students encounter in the aftermath of the epidemic.

**Keywords:** anxiety disorder, depression and stress.

## **1. Introduction**

The COVID-19 pandemic has profoundly altered the lives of high school students globally, introducing social distancing as a pivotal measure to mitigate the virus's spread. This approach blurred the boundaries between study and home environments, particularly impacting Vietnam during its fourth wave (April 27, 2021, to February 8, 2022). The Ministry of Health of Vietnam (2022) reported 2,373,577 new cases, including 192 instances of the OMICRON variant, compelling students to transition to online learning. Given the pandemic's adverse effects and the imposed social distancing, students' psychological well-being, especially among 12th graders facing imminent graduation exams, has been significantly compromised. Previous research suggests the potential for complex and enduring mental health challenges among students. Assessing the psychological impacts on students during online learning and social distancing periods is critical, not only for academic insights but also for supporting mental health in educational settings and shaping policies to navigate the pandemic (Anh et al., 2006; Dam et al., 2013).

Epidemiological studies have established the prevalence of anxiety disorders among children and adolescents, with rates ranging from 15-20 % according to Blum et al. (2012), and varying between 9-32 % across different developmental stages (Essau, Gabbidon, 2013; Golovina, 2009). Bergman et al. (2007) found a negative correlation between the prenatal period and mental development, alongside a positive association with infantile fearfulness. Similarly, research by O'Connor et al. (2003) on maternal anxiety during pregnancy highlighted a doubled risk of emotional disorders and attention-deficit/hyperactivity symptoms in offspring at ages 47 and 81 months. Additionally, a longitudinal study by Prior et al. (2000), involving 2,443 children from birth to 18 years, revealed that 42 % of children exhibiting shyness, social withdrawal, and inhibition by age 9 developed anxiety disorders by ages 13-14.

Finally, extensive literature highlights the interplay between stress, fearfulness, emotional disorders, and psychological trauma (Bergman et al., 2007; Grills-Taquechel, Ollendick, 2012; Remschmidt, van Engeland, 2012; O'Connor et al., 2003), suggesting that stress and depression may exacerbate students' anxiety during the pandemic. This study aims to explore the potential positive correlation between stress, depression, and anxiety disorders among students, proposing interventions to sustain psychological equilibrium throughout this crisis.

## **2. Literature Review**

### **2.1. Stress, Depression and Anxiety disorder**

Anxiety disorders are complex conditions characterized by excessive fear and anxiety, significantly impacting individuals' psychology to perceived future threats (World Health Organization, 1992), and a diminished capacity to adapt to environmental changes (Hoang, 2019; Korabelnikova, 2018; Mash, Barkley, 2014). In children, the etiology of anxiety disorders is multifactorial, encompassing biological, psychological, and social determinants, with notable contributions from genetic predispositions and psychological trauma (Grills-Taquechel, Ollendick, 2012). Fundamental psychological underpinnings, such as childhood psychological trauma, emotional neglect, and attachment issues, are identified as primary causes (Kovalev, 2013). These disorders are often characterized by irrational and undefined worries (Beesdo et al., 2009). Preschool children often experience fear (nyctophobia), while elementary school-aged children may fear loneliness (social isolation anxiety) (Bell-Dolan et al., 1990; Remschmidt, van Engeland, 2012).

Second, stress and anxiety are closely intertwined, with stress often being a precursor to anxiety disorders (Remschmidt, van Engeland, 2012); stress is the response to external pressures (Salmani et al., 2023). Previous studies have suggested that stress was positively correlated with anxiety (Johnston, 2020; Salmani et al., 2023; Young et al., 2020; Windarwati et al., 2022; Tournous, Bagwell-Adams, 2016). For example, Windarwati et al. (2022) showed that anxiety is a set of responses to threatening situations or uncertainty in five high schools in East Java Province, Indonesia. Research has shown significant associations between stress, anxiety, and depression among university students (Young et al., 2020). Similarly, stressful life events are significantly associated with anxiety symptoms among fourth-year secondary school students in Skopje (Tournous, Bagwell-Adams, 2016). Moreover, individual-familial characteristics like age, gender,

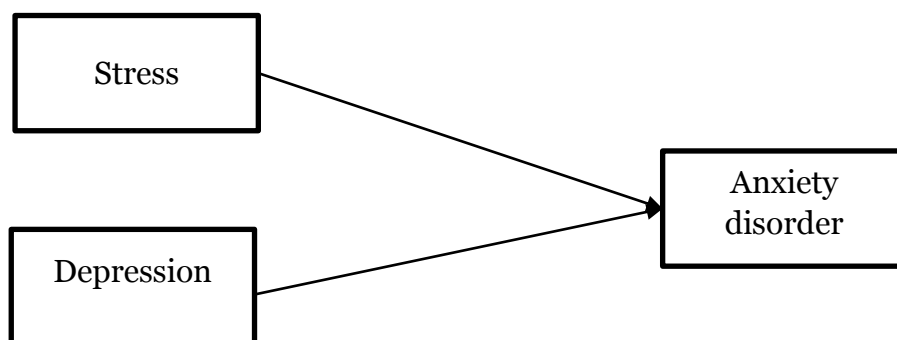
marital status, work experience, and educational level have been found to influence stress levels (Johnston, 2020). Understanding the relationship between stress and anxiety is crucial for mental health support strategies, as stress can exacerbate anxiety disorders, impacting individuals' overall well-being and quality of life. Therefore, we will be demonstrating stress will be positively correlated with anxiety disorder.

Third, depression and anxiety disorders, distinguished by their high prevalence and symptom logical and genetic overlaps, constitute significant public health concerns. Emerging research delineates a pronounced genetic correlation between major depressive disorders and generalized anxiety disorders, positing shared etiological genetic underpinnings (Frolova, 2022; Mei et al., 2022). Beyond their biomedical dimensions, these conditions are also understood as socially constructed phenomena, where the manifestation and perceived severity of symptoms are invariably shaped by the individual's socio-cultural context and personal experiences (Megan et al., 2016). The observed escalation in the incidence of depression, inclusive of anxiety disorders, has been attributed to an amalgamation of stress overload and adverse socio-cultural dynamics, which collectively exert a profound impact on the fabric of human existence (Camila et al., 2022; Wang et al., 2022). A nuanced understanding of the genetic commonalities and intertwined risk factors underlying depression and anxiety disorders is imperative. Such insights promise to refine our understanding of their comorbidity, paving the way for the development of nuanced and efficacious therapeutic interventions tailored to alleviate the burden of these pervasive mental health conditions. Thus, we will be demonstrating depression will be positively correlated with anxiety disorder.

Finally, the social distancing measures, along with the necessity of online learning under highly unfavorable conditions, may exacerbate various psychological issues, including anxiety disorders among students. Consequently, screening and assessing contributing factors to implement measures that ensure the mental well-being of 12th-grade students is of significant importance, not only from a scientific perspective but also in practical terms. This is especially critical for safeguarding students' mental health during the ongoing COVID-19 pandemic and its aftermath. Although several studies have examined anxiety disorders across different age groups in various settings, research specifically targeting 12th-grade students in Vietnam during the COVID-19 pandemic remains limited. Hence, the objective of this study is to shed light on the frequency of anxiety disorders among Vietnamese 12th graders, examine the elements that impact anxiety levels in students during the epidemic, and offer essential suggestions for the prevention and treatment of anxiety disorders among 12th-grade students in Vietnam in the period after COVID-19. The current investigation examines the impact of student stress and depression on anxiety disorders within the COVID-19 pandemic and aims to evaluate the following hypotheses (see Figure 1).

**H1:** Stress will be positively correlated with anxiety disorders among 12th-grade students in Vietnam in the context of the COVID-19 pandemic.

**H2:** Depression will be positively correlated with anxiety disorders among 12th-grade students in Vietnam in the context of the COVID-19 pandemic.



**Fig. 1.** Conceptual Framework

### 3. Methods

#### 3.1. Participants

During the 2021–2022 academic year, a cross-sectional online survey was undertaken with the objective of preparing 12th-grade students for a reintegration into school following a prolonged

term of online learning. The research focused on a formal sample of 1,007 12th-grade students, randomly selected from 8 high schools across Vietnam, including locations in the South (Ho Chi Minh City, Dong Nai province, Long An province) and the North (Hanoi, Hai Duong province, Vinh Phuc province). The sample comprised 1,007 adolescents, with 52.7 % females and 47.3 % males. In terms of learning methods, 205 high school students (20.4 %) participated in both online and offline learning, 343 students (34.1 %) engaged solely in online learning, and 459 students (45.6%) were involved in offline learning. Regarding social distancing measures, 325 students (32.3 %) were not under social distancing, while 682 students (67.7 %) were under social distancing.(see Table 1)

**Table 1.** Participant's information

Criteria		n	%
Gender	Male	476	47,3
	Female	531	52,7
Social distancing	Not under social distancing	325	32,3
	Under social distancing	682	67,7
Learning method	Offline learning	459	45,6
	Combined online and offline learning	205	20,4
	Online learning	343	34,1

### 3.2. Measurement

The 21-item Depression Anxiety and Stress Scales (DASS 21, [Lovibond, Lovibond et al., 1995](#)) were utilized to measure the participants' levels of stress, anxiety, and depression. These items were used to determine the expression and severity of anxiety disorders among Vietnamese students during the COVID-19 period. Participants who responded from 0 (Did not apply to me at all) to 3 (Applied to me very much, or most of the time). The Vietnamese version of the scale has shown good reliability and construct validity ([Tran et al., 2013](#)), with a Cronbach's Alpha coefficient of 0.93.

### 3.3. Procedure

This research was in line with the American Psychological Association's ethical principles and received institutional ethical approval before conducting the survey. The research commenced with the random selection of a sample and outreach to schools for study deployment. Teachers and students were briefed on the study's goals, instruments, and procedures. After thorough understanding, participation was voluntary, with teachers aiding in questionnaire navigation. Only Grade 12 students who were actively engaged during the COVID-19 pandemic were invited to participate in the research. The online sample was recruited by advertising the study to Vietnamese Grade 12 students during stage 3 of the COVID-19 pandemic, and they took time to complete the survey via Google Forms during 2021–2022. Lastly, anonymity was maintained throughout the survey, which lasted 25 minutes and covered demographic details and study-relevant questions.

### 3.4. Data Analysis

First, we described the characteristics of the variables, including percentages, mean scores, and standard deviations, and used Pearson correlation to examine the relationships among the variables with SPSS 26.0. Finally, we conducted a multiple linear regression analysis to assess the independent predictive power of stress, depression on the increase of anxiety disorders.

## 4. Results

### 4.1. Descriptive statistics

The data summarized in [Table 2](#) revealed that the average stress level among students was 1.68 (SD = 1.52), while the average levels for anxiety disorder and depression were 0.82 (SD = 1.24) and 0.61 (SD = 1.06), respectively.

**Table 2.** The levels of anxiety disorder, stress, and depression

Variable	Stress			Anxiety disorder			Depression		
	n	%	M(SD)	n	%	M(SD)	n	%	M(SD)
Normal	338	36.9		63.6	63.6	.82(1.24)	632	69.0	.61(1.06)
Mild	70	7.6	1.68(1.52)	8.2	71.8		108	11.8	
Moderate	215	23.5		16.4	88.2		113	12.3	
Severe	130	14.2		5.9	94.1		29	3.2	
Very severe	163	17.8		5.9	100.0		34	3.7	

Notes: M: Mean; SD: Standardize deviation

**Table 3.** Descriptive between anxiety disorders, stress and depression

Variables	1	2	3
1. Stress	1		
2. Anxiety disorders	0.779***	1	
3. Depression	0.755***	0.727***	1

\*\*\* $p < 0.001$

The correlation analysis results indicated that anxiety disorders was positively related with stress ( $r = 0.779$ ;  $p < 0.001$ ), and depression ( $r = 0.755$ ;  $p < 0.001$ ). Similarly, anxiety disorders were positively related with stress ( $r = 0.727$ ;  $p < 0.001$ ).

#### 4.2. Hypothesis testing

A multiple stepwise regression model of anxiety disorder was estimated, using the four subscales of stress and depression as independent variables (see Table 4). The overall model fit statistics were  $F(2, 912) = 283.649$ ,  $p < .001$ ,  $R^2 = 0.619$ , with an adjusted  $R^2$  of 0.383. The variance inflation factors (VIF) of all the predictor variables were lower than 10 (Hair et al., 2018), thus indicating no danger of multicollinearity in the model. In addition, the Durbin-Watson statistic was 2.056. A Durbin-Watson statistic within the range of 1.5 to 2.5 allowed us to exclude the possibility of first-order serial correlation. Overall, the coping strategy model explained 61.9 % of the variance in anxiety disorder. All the following facets of stress were significant predictors of anxiety disorder ( $B = .314$ ;  $SE = .029$ ;  $p < 0.001$ ), and depression was also a significant predictor of anxiety disorder ( $B = .423$ ;  $SE = .031$ ;  $p < 0.001$ ). Thus, we accepted Hypotheses 1, 2.

**Table 4.** Multiple regression analysis of stress, depression on the anxiety anxiety disorders

Variables	B	SE	t	p	R <sup>2</sup>	Adjusted R <sup>2</sup>	VIF
(Constant)	.035	.021	1.690	.091			-
Stress	.314	.029	10.716	<.001	.619	.383	1.275
Depression	.423	.031	13.859	<.001			1.275

Notes: \*\* $p < 0.01$

#### 5. Discussion

The screening of 12th-grade students in Vietnam has unveiled that stress, depression, and anxiety disorders are interrelated phenomena. Our principal findings reveal a positive correlation between stress and anxiety disorders, aligning with prior research that identified similar associations (Johnston, 2020; Salmani et al., 2023; Young et al., 2020; Windarwati et al., 2022; Tournous, Bagwell-Adams, 2016). Young et al. (2020) found significant links between stress, anxiety, and depression among university students. Moreover, individual and household attributes, including age, gender, marital status, work experience, and academic achievement influence stress levels. Notably, children and adolescents aged 3 to 18 exhibit emotional abnormalities, like anxiety, during the COVID-19 pandemic (Johnston, 2020; Loades et al., 2020; Nearchou et al., 2020; Viner et

al., 2022). Hence, our results concerning 12th-grade students in Vietnam during the COVID-19 period resonate with existing studies, emphasizing the necessity for further validation of these findings.

In addition, our study clearly shown a positive correlation between depression and anxiety disorders, which aligns with the findings of Chen et al. (2021), Dong et al. (2020), and Serra et al. (2021), thereby providing support for our hypothesis. Additionally, the rise in depression and anxiety disorder incidence has been attributed to stress overload and negative socio-cultural dynamics, significantly affecting human existence (Camila et al., 2022; Frolova, 2022; Mei et al., 2022; Wang et al., 2022), and emotional disturbances (Raymond et al., 2022). Notably, thoughts related to depression, including suicidal ideation, were significant among 12th-grade students displaying symptoms of anxiety disorders. The rate of students in social distancing areas considering suicide (nearly 25 %) significantly exceeded Vietnam's pre-COVID-19 rate (2.3 %) and the global rate among children (over 9 %) (Wasserman et al., 2005), and highlighted the role of poor parent-child relationships and irregular schedules (Zheng et al., 2020). However, the results of our study indicate that there is no statistically significant association between social distancing degrees or parent-child relationship quality and anxiety disorder symptoms in 12th-grade students during the COVID-19 pandemic. This discrepancy might be attributed to the easing of COVID-19 restrictions in Vietnam during our study period and the potential for students' adaptability to have lessened the adverse effects of these factors on their anxiety status.

## **6. Limitation, Contribution and Conclusion**

### **6.1. Limitation**

The study has several limitations. Firstly, it is a cross-sectional study, rather than an experimental one. As such, it cannot establish causality in the relationship between the studied variables (stress, depression, and anxiety disorders). Nonetheless, our study reflects the relationship among stress, depression, and anxiety disorders during the COVID-19 pandemic. In the future, experiments will be conducted to ascertain whether stress and depression are necessary precursors for the development of anxiety disorders.

Secondly, all data were derived from self-reported questionnaires. Therefore, the results are based on the reported relationship between stress, depression, and anxiety disorders. In future studies, we aim to employ research designs such as longitudinal and experimental studies to mitigate the biases associated with self-reported data.

Finally, it is important to recognize that this study has specific constraints. Given the time limitations and research circumstances imposed by the COVID-19 epidemic, the study was carried out with a rather small sample size of 1007 12th-grade pupils. The current sample size may be deemed insufficient for the purpose of screening for anxiety disorders.

### **6.2. Contributions**

In light of these findings, several recommendations for government and schools, educational guidance and anxiety prevention, broad prevention strategies and early intervention and social skills training has been put forward. First, Vietnamese government and schools should prioritize bringing high school students back to a normal in-person learning routine, as the COVID-19 pandemic is currently under control. This is highly needed because high school students can only maintain normal mental health when they engage in regular learning, activities, and social relationships. Second, schools and teachers should allocate time for educational guidance and anxiety prevention activities for students, especially 12th-grade students. For those students showing severe anxiety symptoms, early detection and timely implementation of specialized support activities by psychological experts or mental health specialists are essential. Third, factors that contribute to anxiety disorders in 12th-grade students through broad prevention strategies and early intervention should be controlled in the first place. Specifically, students who are screened and show signs of stress, depression, to limit negative outcomes of anxiety disorders. Lastly, high schools should implement social skills training programs for 12th-grade students, focusing on developing study abilities, managing psychological stress during exams, which help to enhance social interaction skills, seeking assistance, emotional regulation skills, and fostering positive thinking capacities.

### **6.3. Conclusion**

Anxiety disorder is a common emotional disorder characterized by vague feelings of anxiety, psychological function, high percentage of students have shown symptoms of anxiety disorders

compared to the pre-COVID-19 period, and warranting careful attention. Additionally, the level of stress and depression had a significant impact on the severity of anxiety disorders among students. This finding share with similar studies previously conducted on students in during COVID-19 pandemic.

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