
RESEARCH ARTICLE

Relationship Between Academic Stress and Math Scores in Grade 9 Students

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ABSTRACT

This study investigated the relationship between academic stress and math scores in Grade 9 students. Additionally, it sought to examine the relationship between students' academic stress and their academic performance in the subject of Mathematics. It utilized the descriptive correlational method of research with the use of a standardized questionnaire. There were 210 respondents in the study and it used a simple random sampling technique. The respondents were Grade 9 students from Jagobiao National High School, one of the public high schools in the city of Mandaue. There were four statistical treatments employed in this study, namely, frequency count, simple percentage, weighted mean, and Pearson's *r*. It was revealed that most of the respondents were 14 years old and were female. The level of academic stress experienced by the respondents in learning mathematics was moderate while the level of the students' academic performance in math was approaching proficiency. The study found no statistically significant correlation between academic stress and math performance. However, the researcher suggests that the recommended approach for improving math performance should be implemented and monitored.

KEYWORDS

Academic Stress, Mathematics Performance, High School Education, Stress and Learning

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Introduction

High school life is one of the most crucial periods in a person's life, marked by significant experiences and self-discovery that shape one's identity. Also, it is the cycle when a student takes part in different roles and responsibilities as he prepares himself for the next chapter of his life. As a consequence, it is the time when one undergoes stress. According to Shahsavarani et al. (2015) stress is a common occurrence anywhere around the entire human life and it has happened to everyone. Students encounter different sources of stress and one of these is the academic stress. Teenagers are especially susceptible to the issues brought on by academic stress since they are going through both personal and societal changes (Ghatol, 2017). Additionally, academic stress can stem from high expectations from parents and teachers, fear of failure, excessive homework, examinations, and a competitive academic environment. These stressors can have both psychological and physical effects, such as anxiety, sleep disturbances, reduced concentration, and even depression (Pascoe et al., 2020).

Academic stress often times neglected by some parents and teachers but actually it has a high effect on the emotional and physical state of the learner and usually leads to depression. According to the Organisation for Economic Cooperation and Development (OECD) survey conducted in 2015, which included 540,000 students across 72 participating countries, many students exhibit high levels of anxiety regarding school work and tests (OECD, 2015). Moreover, Deng et al. (2022) emphasized that stress is not harmless, academic and family stress has been confirmed to lead to depression in students, which in turn negatively impacts academic performance and learning outcomes. As a result, stress can spiral into significant emotional distress, undermine students' well-being, and limit their academic potential (Pascoe et al., 2020).

In the Philippines, high school students typically enrolled in eight subjects daily, each with different competencies, and different standards expected from their respective teachers. This often places significant academic pressure on students, who frequently struggle to allocate the limited time they have to complete tasks, leading to stress and anxiety. One of these eight

subjects is Mathematics a core component of the general education curriculum known for its complexity. Filipino students historically underperform in mathematics, with over 50% scoring below the minimum proficiency level (Hernandez et al., 2024). Mathematics is valued not only for its fundamental principles but also for its application in fostering critical thinking, problem solving, reasoning, effective communication, making real-life connections, and informed decision-making. Students are expected to master these competencies, often using appropriate technology, which can heighten both the cognitive demands and the associated stress (Ocumen & Callaman, 2025). In line with this, in the Philippine education system, mathematics is one of the top priorities in terms of the number of hours allocated per class in all levels. The Department of Education (DepEd) mandated a 50-minute time allocation every day based on the old curriculum (Revised Basic Education Curriculum) and 1 hour for 4 days as mandated in the new curriculum (K to 12 Curriculum).

Teachers often observe that students in experience significant stress as they juggle the demands of multiple subjects and school responsibilities (Suldo et al., 2009). At this stage, students commonly face challenges in emotional regulation intensified by academic expectations and social pressures making it critical to learn strategies for managing anxiety and stress to safeguard their well-being (Chemogosi, 2024; Kobra, 2024). Additionally, the shift from middle school to Grade 9 brings more rigorous academic standards and heightened expectations for autonomy, increasing the burden on students and potentially exceeding their coping capacities. Moreover, students must master time management skills to keep up with the pace of learning as the workload rises especially in dealing with the challenging courses like advanced math, physics, and chemistry which call for a deeper degree of comprehension as well as critical thinking and problem-solving abilities. Therefore, Grade 9 is a challenging academic level for students due to the academic expectations, social pressures, teenage years, transitions, time management, and study skills. This is the reason why the researcher chose this level.

This study, established the impact of academic stress on the performance students (i.e. 9th grade) in mathematics at Jagobiao National High School. The output of this study which is the proposed math performance enhancement plan will be beneficial to the stakeholders which include the department of education, school principal, teachers, students, parents and of course the researchers. It will serve as a guide in crafting a curriculum in mathematics that eliminates or lessen the academic stress experienced by the learners for the improvement of their mathematics performance.

Related Literature

The transition from one level to another represents a critical developmental milestone, marked by increased academic expectations and emotional challenges. This stage is widely recognized as one of the most stressful periods in adolescence, as students adjust to heavier workloads while undergoing significant psychological and social development (Evans, 2018). Anxiety and stress are particularly prevalent due to the combination of school responsibilities and the onset of puberty-related changes. Moreover, peer relationships play a key role during this period supportive friendships can foster greater academic motivation and engagement, which are linked to improved academic outcomes (Shao et al., 2024).

Emotional regulation is another crucial factor in students' adjustment during this stage. While overall emotional regulation may not always predict susceptibility to peer pressure, specific strategies such as expressive suppression have been negatively associated with social resilience, indicating that students who suppress emotions may be more vulnerable to peer influence (Sruthi et al., 2024). A positive school climate including feelings of belonging, fairness in discipline, and strong student-teacher relationships has also been shown to reduce anxiety and depression while promoting emotional well-being (Thapa et al., 2013). These findings highlight the importance of creating emotionally supportive school environments and equipping Grade 9 students with adaptive emotional regulation strategies to help them succeed both academically and socially.

Methodology

This study employed a descriptive-correlational design to examine the relationship between academic stress and the mathematics performance of Grade 9 students. It aimed to describe how the variables naturally occur and relate to each other. The Input-Process-Output (IPO) model was used to organize the flow of the study. The research was conducted at Jagobiao National High School in Mandaue City, with Grade 9 students as the respondents. The total number of participants was determined using Slovin's Formula, and simple random sampling was applied to ensure fair representation. Data collection was done using the Academic Stress Scale (ASS) developed by Kohn and Frazer (1986), which included 15 items rated on a Likert scale from 1 (not stressful) to 5 (extremely stressful). The questionnaire also gathered personal information such as age, gender, parents' educational background, and monthly income. Students' first quarter math grades were used to assess academic performance, categorized from "Beginning" (74 and below) to "Advanced" (90–100). The Likert Scale of Summated Ratings was used to assign numerical values and compute the weighted mean, indicating the overall level of academic stress. To determine the relationship between academic stress and math performance, Pearson's r was used as the statistical tool, which measures the strength and direction of correlation between two variables. This methodology allowed the researchers to understand how academic stress affects students' performance in math within a structured and measurable framework.

Table 1. Age and Gender of the Respondents

Age (in years)	Female		Male		Total	
	f	%	f	%	f	%
Above 15	6	2.86	8	3.81	14	6.67
15	28	13.33	29	13.81	57	27.14
14	77	36.67	59	28.10	136	64.76
13	2	0.95	1	0.48	3	1.43
Total	113	53.81	97	46.19	210	100.00

Results

As displayed in Table 1, there were 113 out of 210 respondents who are female students which comprised 53.81 percent of the respondents while there were 97 or 46.19 percent of them were male students. Seventy-seven or 36.67 percent of the female students were 14 years old while the rest of the female respondents were 15 years old. On the other hand, fifty-nine or 28.10 percent of the male respondents were 14 years old and 29 or 13.81 percent of the male respondents were 15 years old and eight or 3.81 percent of the male respondents were 15 years old and above and only one or 0.48 percent of them had age 13 years old.

Table 2. Parents' Highest Educational Attainment

Educational Attainment	Mother		Father	
	F	%	f	%
Master's Graduate	8	3.81	6	2.86
With Master's Units	4	1.90	2	0.95
College Graduate	40	19.05	36	17.14
College Level	15	7.14	21	10.00
High School Graduate	96	45.71	89	42.38
High School Level	27	12.86	33	15.71
Elementary Graduate	10	4.76	10	4.76
Elementary Level	8	3.81	7	3.33
No Formal Schooling	1	0.48	0	0.00
No Response	1	0.48	6	2.86
Total	210	100.00	210	100.00

The table showed that the majority of parents are high school graduates, with 96 constituting 45.71 percent of total respondents for mother's educational attainment and 89 constituting 42.38 percent of total respondents for father's educational attainment, followed by college graduates, with 40 constituting 19.05 percent on the mother's side and 36 constituting 17.14 percent on the father's side in the college graduate level. Interestingly, there were eight, or 3.81 percent, have a master's degree on their mother's side and six, or 2.86 percent, on their father's side. On the other hand, one or 0.48 percent of the mother's side had no formal schooling, one or 0.48 percent had no response to the mother's educational attainment, and six or 2.86 percent had no response to the father's educational attainment.

Table 3. Combined Family Monthly Income

Monthly Income (in pesos)	f	%
Above 30,000	18	8.57
25,001-30,000	19	9.05
20,001-25,000	25	11.90

15,001-20,000	39	18.57
10,001-15,000	41	19.52
10,000 and below	68	32.38
Total	210	100.00

Table 3 above features the combined family income of the respondents. It can be seen that 68 or 32.38 percent of the parents have a combined monthly income of P10,000 and below. Besides, 41 or 19.52 percent of the respondents whose combined monthly income ranged from P10,001 to P15,000, followed by 39 or 18.57 percent of the parents whose income ranged from P15,001 to P20,000. There were 25 or 11.90 percent of the parents with an income ranging from P20,001 to P25,000 followed by 19 or 9.05 percent of the parents whose income ranged from P25,001 to P30,000. However, 18 or 8.57 percent of them had an income above P30,000. This implies that their monthly income can represent parents' ability to send their children to school.

Table 4. Level of academic stress experienced by the respondents in learning Mathematics

S/N	Indicators	WM	Verbal Description
1	Understanding complex mathematical concepts	3.02	Moderate
2	Completing mathematics homework	2.72	Moderate
3	Preparing for mathematics tests and exams	3.29	Moderate
4	Participating in mathematics class discussions	2.76	Moderate
5	Working on mathematics group projects	2.77	Moderate
6	Achieving high grades in mathematics	3.50	Moderate
7	Keeping up with the pace of mathematics lessons	2.82	Moderate
8	Managing time effectively for mathematics study	2.92	Moderate
9	Balancing mathematics study with other subjects	3.33	Moderate
10	Coping with the fear of failure in mathematics	3.40	Moderate
11	Navigating the use of mathematics technology	3.00	Moderate
12	Adapting to different teaching styles in mathematics	3.07	Moderate
13	Engaging in mathematics extracurricular activities	3.08	Moderate
14	Handling peer pressure in mathematics performance	3.13	Moderate
15	Understanding the feedback from mathematics teachers	2.52	Low
Aggregate Weighted Mean		3.02	Moderate

The data shows that students generally experience a moderate level of academic stress when learning mathematics, with an overall weighted mean of 3.02. All but one of the 15 indicators were rated as moderate, meaning students feel a noticeable but manageable amount of stress in most math-related tasks. The highest stress levels were reported in trying to achieve high grades (3.50), coping with the fear of failure (3.40), and balancing math with other subjects (3.33). These suggest that performance expectations and workload are major sources of pressure. On the other hand, the lowest stress level was in understanding feedback from teachers (2.52), which was the only item rated as low. This means students generally do not feel too stressed when receiving feedback in math. Other common stress points include preparing for tests (3.29), understanding complex concepts (3.02), and managing time for study (2.92). Overall, while none of the stress levels reached the "high" category, the consistent "moderate" ratings suggest that math learning brings steady and widespread pressure among the students.

Table 5. Level of Academic Performance of the Respondents in Math

Level	Numerical Range	f	%
Advanced	90-100	20	9.52
Proficient	85-89	43	20.48
Approaching Proficiency	80-84	72	34.29
Developing	75-79	68	32.38
Beginning	74 and below	7	3.33
Total		210	100.00

Mean	81.70
St. Dev.	5.36

The data in Table 5 shows the academic performance levels of the 210 Grade 9 students in Mathematics. The majority of students fall under the "Approaching Proficiency" level (80–84), making up 34.29% of the respondents. This is followed closely by "Developing" (75–79) at 32.38%, indicating that a large portion of students are still building their math skills and need some support. 20.48% reached the "Proficient" level (85–89), showing they have developed solid understanding and skills. Only a small number achieved "Advanced" performance (90–100), accounting for 9.52%, while 3.33% were in the "Beginning" level (below 75), suggesting they are struggling in math. The mean score was 81.70, with a standard deviation of 5.36, indicating that most students performed within a moderately narrow range around the average. Overall, the data suggests that while most students are performing at an average level, only a few are excelling or significantly struggling in math.

Table 6. Test of significant relationship between the academic stress experienced by the respondents and their academic performance in Mathematics

Variables	r-value	Strength of Correlation	p - value	Decision	Result
Academic Stress and Performance in Math	-0.123	Negligible Negative	0.076	Do not reject Ho	Not Significant

*significant at $p < 0.05$ (two-tailed)

Table 6 presents the results of the statistical test examining the relationship between academic stress and academic performance in Mathematics among Grade 9 students. The computed r-value is -0.123, indicating a negligible negative correlation. This means that as academic stress slightly increases, performance in math slightly decreases, but the relationship is very weak. The p-value is 0.076, which is greater than the significance level of 0.05, leading to the decision to not reject the null hypothesis (Ho). Therefore, the result is not statistically significant, suggesting that there is no meaningful relationship between the level of academic stress experienced by students and their performance in Mathematics based on the data collected.

Discussion

The findings of this study demonstrate that students generally experience a moderate level of academic stress in mathematics, especially when the stakes feel high achieving top grades, coping with fear of failure, and balancing math with other subjects all emerged as notable stress triggers. However, the analysis revealed a negligible negative correlation between academic stress and math performance, suggesting no significant relationship. This aligns with other studies in the broader educational literature: for example, research among pre-service mathematics students found that while they experienced moderate stress, these stress levels did not significantly correlate with their cumulative GPA (Jamieson et al., 2021). This suggests that even when students report moderate stress, it may not manifest in immediate academic decline, possibly due to coping strategies or supportive contexts.

Conversely, substantial research on math anxiety a more intense form of stress specific to mathematics shows a consistently negative impact on math performance. A meta-analysis by Barroso et al. (2021) found a small to moderate negative correlation between math anxiety and achievement. These results imply that when anxiety intensifies beyond moderate stress, it more reliably undermines performance. The discrepancy between our findings and existing literature may be explained by the nature of our measure, the sample population, or contextual factors such as resilience and support systems. Ultimately, while moderate academic stress in math appears manageable for students, elevated levels of anxiety when pervasive carry a stronger potential to impair performance, as supported in wider research.

Conclusion

Based on the findings of the study, it can be concluded that students experience a moderate level of stress when learning mathematics. Moreover, students feel pressure when aiming to get high grades, and balance math with other subjects. However, the results also show that this level of stress does not have a significant effect on their math performance. While some students feel stressed, it does not clearly lower their grades. This indicates that even though students face pressure, many are still able to cope and perform in mathematics. Overall, the study suggests that stress is present, but it may not always directly affect how well students do in mathematics.

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