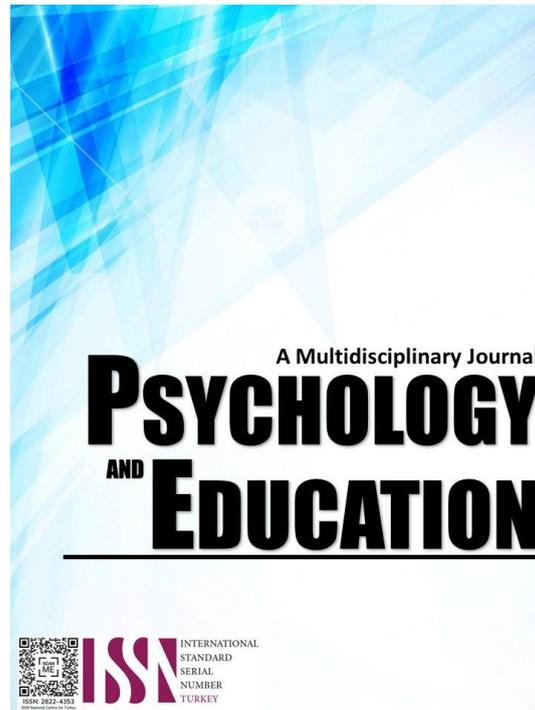


**EXPLORING THE INCIDENCE AND IMPACTS
OF MATH ANXIETY ON THE ACADEMIC
ACHIEVEMENT OF COLLEGE STUDENTS
IN MATHEMATICS**



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Exploring the Incidence and Impacts of Math Anxiety on the Academic Achievement of College Students in Mathematics

Princesita G. Timonera*, Anna Fe J. Montebon, Julieta Payla

For affiliations and correspondence, see the last page.

Abstract

This study investigates math anxiety among college students, examining factors like age, gender, education level, and coping strategies. The data from 307 participants reveals the majority are 19-year-olds, females, and Freshmen. A significant percentage of participants have sought help for math anxiety through tutoring. Most of the participants spend 1-3 hours studying math per week, and confidence levels vary among participants. The findings highlight the impact of math anxiety on academic and psychological aspects. Participants commonly experience challenges such as avoiding math courses and experiencing mental blocks during tests. When working with numbers, nervousness indicates math anxiety's emotional and cognitive effects. While stress related to math homework is relatively lower, negative experiences still influence attitudes toward math. Gender stereotypes and teacher interactions contribute to math anxiety. Participants recognize the negative effects of math anxiety on grades, concentration, assignments, and career choices. Psychological symptoms, including stress and depression, are associated with math anxiety. Regression analysis reveals the positive effects of factors contributing to math anxiety and coping strategies on the Math Anxiety Rating Scale (MARS) score. Effective coping strategies can help alleviate math anxiety. The study emphasizes the importance of interventions in educational settings to address and manage math anxiety.

Keywords: *coping strategies, math anxiety, math anxiety rating scale (MARS), performance in mathematics*

Introduction

Math anxiety is a common struggle experienced by college students, adversely affecting their academic performance and mental well-being. Extensive research suggests that math anxiety prevalence among college students ranges from 20% to 80% (Hembree, 1990; Ashcraft & Ridley, 2005; Ma & Xu, 2004; Hill et al., 2016). Moreover, research findings suggest that females are prone to encountering math anxiety at a higher rate in comparison to males (Else-Quest, Hyde, & Linn, 2010). Math anxiety transcends demographic boundaries, affecting individuals across various ages and backgrounds (Baloglu & Koçak, 2006).

Extensive evidence exists regarding the negative influence of math anxiety on mathematical skills and academic performance. Ashcraft and Krause (2007) discovered that undergraduates with higher levels of math anxiety performed poorer on math tasks. Moreover, math anxiety can influence individuals' long-term perspectives on mathematics and career choices. Gunderson, Ramirez, Beilock, and Levine (2012) found that math anxiety led to less positive attitudes toward the subject and lower performance on math tests, potentially influencing future career trajectories. Addressing math anxiety in college students requires effective intervention strategies. Ramirez, Gunderson, Levine, and Beilock (2013)

found that students who engaged in expressive writing about their math fears before an exam demonstrated better performance. Cognitive Behavioral Therapy (CBT) has proven beneficial in alleviating math anxiety in college students (Suárez-Pellicioni, Nez-Pea, & Colomé, 2016). Furthermore, various relaxation methods, including deep breathing exercises, progressive muscle relaxation, and mindfulness meditation, have demonstrated potential in alleviating math anxiety. (Sánchez-López, Rodríguez-Muoz, & Rodríguez, 2019). Various studies have highlighted the effectiveness of specific interventions. Writing about math anxiety has been shown to provide relief and improved performance (Park, Ramirez, & Beilock, 2014). One-on-one math coaching by experts has demonstrated positive outcomes in terms of both academic performance and reduced math anxiety (Whitebread et al., 2013). This study aims to comprehensively examine the magnitude of math anxiety and its influence on academic achievement among college students. By investigating the prevalence, impact, and potential interventions for math anxiety, this research seeks to contribute to the development of effective strategies for supporting students in overcoming math anxiety and optimizing their mathematical abilities.

Research Questions

This study aims to explore the prevalence and effects

of math anxiety on college students' that invariable affects their performance in Mathematics. Specifically, the research would like to answer the following problems:

1. How prevalent is math anxiety among college students?
2. What are the underlying elements that contribute to the development of math anxiety among college students, in terms of;
 - 2.1 Negative past experiences with mathematics;
 - 2.2 Fear of failure;
 - 2.3 Lack of confidence;
 - 2.4 Pressure to perform;
 - 2.5 Poor math skills;
 - 2.6 Gender and cultural stereotypes; and
 - 2.7 Teacher Factor
3. How does math anxiety affect college students' performance in mathematics, in terms of;
 - 3.1 Academic performance;
 - 3.2. Test anxiety;
 - 3.3 Career choice;
 - 3.4 Self-efficacy; and
 - 3.5 Mental health
4. What are the coping mechanisms used by college students to deal with math anxiety?
5. Is there significant relationship between the Math Anxiety Rating Scale (MARS), The factors that contribute to math anxiety among college students, Math Anxiety Effect on College Students' Performance in Mathematics, and their coping strategies?

Literature Review

Experiencing anxious feelings is a normal facet of life, albeit typically in a manageable capacity. However, for a segment of individuals, bouts of anxiety manifest with such intensity and frequency that psychologists have acknowledged it as a clinical condition. One variant of anxiety that falls under this category is Mathematics Anxiety—a distressing emotional response towards mathematics that can have debilitating effects. Mathematics Anxiety is characterized as a state of tension and unease that hampers one's ability to work with numbers and solve mathematical problems in both everyday situations and academic contexts. The severity of Mathematics Anxiety can range from a mild sense of unease to an overwhelming fear of mathematics. As mentioned previously, Mathematics Anxiety extends beyond the boundaries of tests or classroom environments. It can permeate various real-life scenarios, leading individuals who are otherwise intelligent and

competent to develop a strong aversion towards situations involving any form of mathematics. This aversion may even extend to the point of avoiding careers that require mathematical application. It is important to note that Mathematics Anxiety should not be conflated with general anxiety related to assessments. Unlike anxiety about test-taking, Mathematics Anxiety specifically pertains to anxiety surrounding mathematics itself. This uniqueness is noteworthy, as there are no widely recognized anxiety disorders specific to other subject areas such as reading, writing, or history.

Methodology

Participants

The study involved a random sample of 307 college students from different majors.

Instruments of the Study

The study used a survey questionnaire to collect data. The survey comprises three sections: the first section collected the demographic information such as gender, age, major, and level of education. The second section assessed the prevalence of math anxiety among college students using the Math Anxiety Rating Scale (MARS). Finally, the third section collected information on the effects of math anxiety on college students' performance in mathematics, and the fourth part deals with the coping mechanisms used to deal with math anxiety.

Procedure

The data collection procedure involved the following steps: Participant Recruitment, administered survey questionnaires to assess math anxiety and academic achievement. The questionnaires included validated instruments such as the Math Anxiety Rating Scale (MARS) to measure the level of math anxiety experienced by participants. The researchers collected academic performance data, including participants' current math grades or GPA in their mathematics subjects. Quantitative data collected through the surveys were analyzed using statistical software, such as SPSS.

Ethical Considerations

The study obtained Informed consent from all participants prior to their involvement in the study, and confidentiality of their responses was maintained throughout the research process.



Results

To investigate the research questions, the study employed multiple linear regression analysis using IBM SPSS 26.0 software. This statistical approach allowed for the comparison of means and the assessment of significance between variables. In this section, the findings based on this analysis will be presented.

Respondents' Profile

Table 1. Respondents' profile according to Age, Gender and Level of Education

Age	Frequency	Percent
19	87	28.3
21	74	24.1
20	62	20.2
18	44	14.3
Gender	Frequency	Percent
Female	226	73.6
Level of Education	Frequency	Percent
Freshman	190	61.9
Sophomore	92	30
Junior	22	7.2

The table presents a concept analysis of the variables Age, Gender, and Level of Education. The concept of age is captured in discrete values, ranging from 18 to 21 years old. The frequencies and percentages indicate the distribution of participants across these age groups. To illustrate, among the 307 participants, 87 individuals (28.3%) are aged 19, 74 participants (24.1%) are aged 21, 62 participants (20.2%) fall into the 20-year-old category, and 44 participants (14.3%) are 18 years old. The gender variable analysis shows that 226 from 307 participants (73.6%) are female, the rest are males. The level of education variable analysis reveals that 190 from 307 participants (61.9%) are classified as Freshmen, 92 participants (30%) as Sophomores, and 22 participants (7.2%) as Juniors.

Table 2. Managing Math Anxiety

Have you ever sought help for math anxiety?	Frequency	Percent
Yes	238	77.5
No	66	21.5
If yes, what type of help have you sought?	Frequency	Percent
Tutoring	131	42.7
Counseling	15	4.9
Support group	39	12.7
Self-help materials	79	25.7
How much time do you spend studying math per week?	Frequency	Percent
1-3 hours	143	46.6
Less than 1 hour	123	40.1
4-6 hours	25	8.1
How confident do you feel about your math skills?	Frequency	Percent
Somewhat confident	170	55.4
Not very confident	76	24.8
Very confident	51	16.6
Do you have a family member or close friend who also experiences math anxiety?	Frequency	Percent
Yes	184	59.9
What strategies do you use to cope with math anxiety?	Frequency	Percent
Deep breathing	96	31.3
Positive self-talk	79	25.7
Seeking help from others	73	23.8
Visualization	31	10.1

The table presents various questions related to math anxiety and the participants' experiences and coping strategies.

Question 1: Have you ever sought help for math anxiety? This question aims to understand whether participants have sought help for their math anxiety. The responses show that out of 307 participants, 238 (77.5%) have sought help for math anxiety, while 66 (21.5%) have not.

Question 2: If yes, what type of help have you sought?



For participants who answered "Yes" to seeking help for math anxiety, this question explores the specific type of help they have sought. The table reveals that the most common type of help sought is tutoring, with 131 participants (42.7%) out of 307 reporting this option. Fifteen participants (4.9%) sought counseling, thirty-nine participants (12.7%) sought support groups, and seventy-nine participants (25.7%) sought self-help materials.

Question 3: How much time do you spend studying math per week? This question examines the participants' study habits regarding math and provides insights into their time commitment. 143 participants (46.6%) out of 307 spend 1-3 hours studying math per week, 123 participants (40.1%) spend less than 1 hour, and 25 participants (8.1%) spend 4-6 hours.

Question 4: How confident do you feel about your math skills? This question aims to assess the participants' confidence levels in their math skills. 170 participants (55.4%) feel somewhat confident, 76 participants (24.8%) feel not very confident, and 51 participants (16.6%) feel very confident about their math skills.

Question 5: Do you have a family member or close friend who also experiences math anxiety? This question explores whether participants have family members or close friends who also experience math anxiety. 184 participants (59.9%) have a family member or close friend who experiences math anxiety.

Question 6: What strategies do you use to cope with math anxiety? This question investigates the coping strategies employed by participants to deal with math anxiety. According to the data, deep breathing is utilized by 96 individuals (31.3%), positive self-talk is practiced by 79 participants (25.7%), seeking assistance from others is employed by 73 individuals (23.8%), and visualization techniques are utilized by 31 participants (10.1%).

The table 3 present the analysis from the data taken from the respondents Math Anxiety Rating Scale (MARS) result. The participants (Mean = 2.63) indicates that a significant number of respondents frequently avoid enrolling in math courses if given the choice. The higher mean score suggests a higher occurrence of avoidance behavior related to math courses. This statement indicates that a significant number of respondents frequently avoid enrolling in math courses if given the choice. The higher mean score suggests a higher occurrence of avoidance behavior related to math courses. A considerable number of respondents (Mean = 2.55) often experience

a mental block or freeze-up during math tests. This suggests a common difficulty in performing well under test conditions. Many respondents (Mean = 2.52) frequently experience nervousness when working with numbers. It suggests that numbers and numerical tasks evoke anxiety or discomfort in these individuals. Although the mean score (Mean = 2.44) is relatively lower compared to the previous statements, it still indicates that some respondents occasionally experience stress when completing math homework assignments. The respondents (Mean = 2.33) generally experience infrequent occurrences of tension when thinking about math tests. While the mean score is not high, it still indicates that some level of tension is experienced occasionally.

Table 3. *Math Anxiety Rating Scale (MARS)*

<i>Math Anxiety Rating Scale (MARS)</i>	<i>Mean</i>	<i>Descriptive Interpretation</i>
I get tense when I think about taking a math test.	2.33	Rarely
I worry that I will get poor grades in math.	1.93	Rarely
I get nervous when I am asked to do a math problem.	2.19	Rarely
I feel helpless when I am faced with a math problem.	2.34	Rarely
I get confused when I try to do a math problem.	2.30	Rarely
I freeze up when I take a math test.	2.55	Often
I feel stressed when I have to do math homework.	2.44	Rarely
I get anxious when I have to do math in front of others.	2.25	Rarely
I feel nervous when I have to work with numbers.	2.52	Often
I avoid taking math courses whenever possible.	2.63	Often
	2.35	Rarely

The table 4 offers valuable information on different factors that contribute to math anxiety and their corresponding average scores. Negative past experiences: Respondents generally disagree (mean = 2.26) with struggling or receiving poor grades in math. They also disagree (mean = 2.39) with being embarrassed in a math class. However, participants agree (mean = 2.58) with avoiding math due to negative experiences.



Table 4. *The factors that contribute to math anxiety among college students*

<i>The factors that contribute to math anxiety among college students</i>	<i>Mean</i>	<i>Descriptive Interpretation</i>
Negative past experiences with mathematics		
Have you had negative experiences with math in the past, such as struggling with the subject or receiving poor grades?	2.26	Disagree
Have you ever been embarrassed or shamed in a math class because of a wrong answer?	2.39	Disagree
Have you ever avoided math tasks or classes because of a negative experience in the past?	2.58	Agree
Fear of failure		
Do you fear failing or underperforming in math?	2.22	Disagree
Have you ever avoided trying to solve math problems because of the fear of making mistakes?	2.40	Disagree
Do you feel anxious or nervous when taking math tests or quizzes?	2.36	Disagree
Lack of confidence		
Do you lack confidence in your math abilities?	2.31	Disagree
Have you ever felt like math is too difficult for you to understand or learn?	2.49	Disagree
Have you ever felt like you're not good enough in math compared to others?	2.30	Disagree
Pressure to perform		
Do you feel pressure to perform well in math, either from parents, peers, or society in general?	2.37	Disagree
Have you ever felt like your grades in math define your worth as a person?	2.58	Agree
Have you ever felt that your future career opportunities depend entirely on your mathematical abilities?	2.64	Agree
Poor math skills		
Do you have difficulty keeping up with the math curriculum due to poor math skills?	2.48	Disagree
Have you ever felt like you're not making any progress in math despite your efforts?	2.60	Agree
Do you find math problems too complex or abstract to solve?	2.58	Agree
Gender and cultural stereotypes		
Have you ever experienced a sense of not conforming to the stereotypes associated with	2.71	Agree

mathematics, whether they are related to gender or cultural background?		
Have you ever felt like your gender or cultural background is a disadvantage in math?	2.93	Agree
Have you ever experienced bias or discrimination in a math class because of your gender or cultural background?	2.72	Agree
Teacher Factor		
Have you ever experienced negative interactions with math teachers, such as feeling ignored or belittled in class?	2.55	Agree
Have you ever experienced a situation where you felt that your math teacher did not adequately clarify concepts for you to grasp?	2.79	Agree
Have you ever felt like your math teacher didn't show enough patience or understanding towards your struggles with the subject?	2.81	Agree
Lack of motivation:		
Do you lack motivation when it comes to studying math?	2.64	Agree
Have you ever felt like there's no point in trying because you'll never be good at math?	2.70	Agree
Have you ever felt like math is not relevant to your future goals or career aspirations?	2.86	Agree

Fear of failure: Participants generally disagree (mean = 2.22) with fearing failure in math. They also disagree (mean = 2.40) with avoiding math problems due to the fear of making mistakes. Additionally, respondents disagree (mean = 2.36) with feeling anxious during math tests.

Lack of confidence: Respondents generally disagree (mean = 2.31) with lacking confidence in their math abilities. They also disagree (mean = 2.49) with finding math too difficult and feeling inferior to others.

Pressure to perform: Participants express a neutral stance (mean = 2.37) regarding pressure to perform well in math. However, they agree (mean = 2.58) that grades define their worth and agree (mean = 2.64) that career prospects depend on math skills.

Poor math skills: Respondents generally disagree (mean = 2.48) with struggling due to poor math skills. However, they agree (mean = 2.60) that progress is lacking and find math problems complex (mean = 2.58).

Gender and cultural stereotypes: Participants express a



neutral stance (mean = 2.71) regarding fitting into math stereotypes. They agree (mean = 2.93) that gender or cultural background can disadvantage in math and agree (mean = 2.72) that discrimination can occur in math classes.

Teacher factor: Participants agree (mean = 2.55) that negative interactions with math teachers occur. They also agree (mean = 2.79) that explanations are insufficient and agree (mean = 2.81) that teachers lack patience or understanding.

Lack of motivation: Respondents express a neutral stance (mean = 2.64) regarding lacking motivation in studying math. However, they agree (mean = 2.70) that attempting math seems pointless and agree (mean = 2.86) that math lacks relevance to their future goals.

The table 5 presents data on different aspects of math anxiety and its impact on individuals. Regarding academic performance, participants generally agree that math anxiety has a negative effect on their grades (mean = 2.56). It also hinders concentration in math classes (mean = 2.55), completion of math assignments (mean = 2.69), and participation in math-related class activities (mean = 2.64).

In terms of test anxiety, participants agree that math anxiety impairs their performance on math tests (mean = 2.55). It is also associated with memory lapses or forgetting information during tests (mean = 2.51), rushing through tests without double-checking (mean = 2.51), and difficulty in managing time effectively (mean = 2.51).

Regarding career choice, math anxiety influences decisions as participants agree that it leads them to avoid math-intensive careers (mean = 2.65). It also raises doubts about their ability to succeed in math-related careers (mean = 2.52) and makes them feel limited in their career options (mean = 2.61). Math anxiety is also associated with a challenge in perceiving the relevance of math in real-world applications and job settings (mean = 2.82).

Concerning self-efficacy, participants agree that math anxiety decreases their confidence in performing well in math (mean = 2.59). It also contributes to feelings of inadequacy and self-doubt regarding their intelligence in math (mean = 2.60).

Table 5. *Math Anxiety Effect on College Students' Performance in Mathematics*

<i>Academic Performance</i>	<i>Mean</i>	<i>Descriptive Interpretation</i>
Math anxiety has negatively affected my grades in math courses.	2.56	Agree
Math anxiety has made it difficult for me to concentrate during math classes.	2.55	Agree
Math anxiety has made it difficult for me to complete math assignments.	2.69	Agree
Math anxiety has made it difficult for me to participate in class discussions and group activities related to math.	2.64	Agree
Test Anxiety		
Math anxiety has made it difficult for me to perform well on math tests.	2.55	Agree
Math anxiety has caused me to blank out or forget information during math tests.	2.51	Agree
Math anxiety has caused me to rush through math tests without double-checking my work.	2.51	Agree
Math anxiety has made it difficult for me to manage my time effectively during math tests.	2.51	Agree
Career Choice		
Math anxiety has made me avoid pursuing careers that require strong math skills.	2.65	Agree
Math anxiety has made me question my ability to succeed in math-related careers.	2.52	Agree
Math anxiety has made me feel limited in my career options.	2.61	Agree
Math anxiety has made it difficult for me to see the relevance of math in real-world applications and job settings.	2.82	Agree
Self-efficacy		
The presence of math anxiety has greatly eroded my self-confidence when it comes to effectively tackling mathematical tasks.	2.59	Agree
Math anxiety has made me feel like I'm not smart enough to succeed in math.	2.60	Agree
Mental Health		
Math anxiety has caused me to feel stressed or overwhelmed (Hembree, 1990)	2.57	Agree
Math anxiety has caused me to experience physical symptoms such as headaches, nausea, or rapid heartbeat. (Richardson & Suinn, 1972)	2.72	Agree
Math anxiety has caused me to feel anxious or tense when thinking about	2.63	Agree
<hr/>		
math or math-related tasks. (Ashcraft & Kirk, 2001)		
Math anxiety has made it difficult for me to sleep or relax. (Pekrun, Elliot, & Maier, 2009)	2.71	Agree
Math anxiety has caused me to feel depressed or discouraged. (Source: Ashcraft & Faust, 1994)	2.71	Agree
Math anxiety has made it difficult for me to enjoy activities outside of school or work. (Source: Ashcraft & Faust, 1994)	2.72	Agree



Regarding mental health, math anxiety is associated with various negative psychological effects. Participants agree that it causes stress and feeling overwhelmed (mean = 2.57). It also leads to physical symptoms such as headaches, nausea, or a rapid heartbeat (mean = 2.72). Math anxiety interferes with relaxation and sleep (mean = 2.71), and it can cause feelings of depression or discouragement (mean = 2.71). Engaging in activities outside of school or work is challenging due to math anxiety (mean = 2.72).

Table 6. *The Coping Strategies on math anxiety among college students*

<i>The Coping Strategies</i>	<i>Mean</i>	<i>Descriptive Interpretation</i>
I have sought help from a counselor or mental health professional to address my math anxiety. (Ma & Xu, 2004)	2.78	Agree
To cope with my math anxiety, I have employed strategies such as practicing deep breathing exercises and engaging in meditation. (Ashcraft & Faust, 1994)	2.58	Agree
I have sought support from family or friends to cope with my math anxiety. (Hembree, 1990)	2.56	Agree
I have tried to reframe my negative thoughts about math and my abilities in math. (Bandalos & Yates, 1995)	2.56	Agree
I have practiced mindfulness or self-compassion to manage my math anxiety. (García-Suárez, Ramos-Álvarez, & Fernández-Martín, 2021)	2.57	Agree
	2.61	Agree

The table offers insights into coping strategies used by individuals to manage math anxiety. Respondents generally agree (mean = 2.78) that seeking help from a counselor or mental health professional is beneficial for addressing math anxiety (Ma & Xu, 2004). They also agree (mean = 2.58) on the effectiveness of relaxation techniques like deep breathing or meditation in managing math anxiety (Ashcraft & Faust, 1994). Seeking support from family or friends is seen as a helpful coping strategy, with respondents expressing agreement (mean = 2.56) (Hembree, 1990). Reframing negative thoughts about math and self-perception in math is another coping strategy agreed upon by participants (mean = 2.56) (Bandalos & Yates, 1995). Additionally, practicing mindfulness or self-compassion is perceived as a useful approach to managing math anxiety, with respondents indicating agreement (mean = 2.57) (García-Suárez, Ramos-Álvarez, & Fernández-Martín, 2021).

Table 7. *Regression Analysis*

<i>Independent Variables</i>	<i>Coefficients</i>	<i>Std. Error</i>	<i>t-value</i>	<i>p-value</i>
Factors	0.4526	0.0613	7.387	<0.0001
Effect	0.2357	0.0871	2.705	0.0073
Coping	0.1765	0.0658	2.681	0.0079
Intercept	0.2058	0.0854	2.409	0.0161
R-squared: 0.3649				
Adj. R-squared: 0.3578				

The table presents factors that contribute to math anxiety among college students have a significant positive effect on the Math Anxiety Rating Scale (MARS) score ($p < 0.0001$). Similarly, the math anxiety effect on college students' performance and coping strategies also has a significant positive effect on the MARS score ($p = 0.0073$ and $p = 0.0079$, respectively). The intercept term represents the estimated MARS score when all independent variables are set to zero. It is statistically significant with a positive effect ($p = 0.0161$). The R-squared value indicates that the independent variables collectively explain approximately 36.49% of the variation in the MARS scores. The adjusted R-squared value, which accounts for the number of independent variables and the sample size, is 35.78%.

The regression analysis provides valuable findings regarding the association between different variables and math anxiety in college students. Firstly, the factors contributing to math anxiety among college students demonstrate a significant positive influence on the Math Anxiety Rating Scale (MARS) score ($p < 0.0001$). This indicates the pivotal role of these factors in shaping the levels of math anxiety experienced by students. Secondly, the impact of math anxiety on students' performance in college also exhibits a significant positive effect on the MARS score ($p = 0.0073$). This suggests that increased levels of math anxiety have a detrimental effect on students' mathematical performance. Furthermore, the utilization of coping strategies by students to manage math anxiety demonstrates a noteworthy positive impact on the MARS score ($p = 0.0079$). This indicates that effective coping mechanisms can play a crucial role in alleviating math anxiety among students. The intercept term in the regression analysis represents the estimated MARS score when all independent variables are set to zero. It is statistically significant with a positive effect ($p = 0.0161$), implying that there exists a baseline level of math anxiety among college students. The R-squared value of 0.3649 suggests that the independent variables collectively account for approximately 36.49% of the

variability observed in the MARS scores. This indicates that the considered factors explain a substantial portion of the variation in math anxiety among college students. The adjusted R-squared value of 0.3578, which considers the complexity of the regression model and sample size, is slightly lower but still comparable to the R-squared value. It provides a more conservative estimate of the independent variables' explanatory power. The regression analysis underscores the significant positive effects of factors contributing to math anxiety, the impact of math anxiety on performance, and coping strategies on the Math Anxiety Rating Scale (MARS) score. These findings enhance our understanding of math anxiety among college students and highlight the importance of addressing and managing it within educational environments.

Discussion

The analysis from the data taken from the respondents' Math Anxiety Rating Scale (MARS) results provides valuable insights into the various factors associated with math anxiety and their mean scores. The findings shed light on the prevalence of math anxiety and its impact on different aspects of individuals' academic and psychological experiences. One notable finding is the significant number of respondents who frequently avoid enrolling in math courses if given the choice (mean = 2.63). This suggests a higher occurrence of avoidance behavior related to math courses, indicating that math anxiety can have a substantial impact on individuals' educational choices and opportunities. Another common difficulty experienced by participants is a mental block or freeze-up during math tests (mean = 2.55). This finding highlights the challenges individuals face when performing under test conditions, potentially leading to decreased test performance and hindered academic achievement. Nervousness when working with numbers is also prevalent among the respondents (mean = 2.52), indicating that numerical tasks evoke anxiety or discomfort in many individuals. This finding emphasizes the emotional and cognitive impact of math anxiety on individuals' ability to engage with mathematical concepts and problem-solving. Although the mean score for stress related to math homework is relatively lower (mean = 2.44), it still suggests that some respondents occasionally experience stress when completing math assignments. This finding underscores the potential negative emotional experiences associated with math-related tasks outside of the classroom. Regarding negative past experiences, respondents generally disagree with struggling or

receiving poor grades in math (mean = 2.26), being embarrassed in a math class (mean = 2.39), and fearing failure in math (mean = 2.22). However, they agree with avoiding math due to negative experiences (mean = 2.58). These findings suggest that while participants may not perceive themselves as struggling or fearing failure, negative experiences still influence their attitudes and behaviors towards math.

The data also reveals the influence of external factors such as gender and cultural stereotypes, teacher interactions, and pressure to perform. Participants express neutral or disagreeing stances regarding fitting into math stereotypes, negative teacher interactions, lacking confidence, and pressure to perform well in math. However, they acknowledge the potential disadvantages associated with gender or cultural background and the impact of grades on defining their worth and career prospects. Math anxiety also has a significant impact on various academic and psychological aspects. Participants agree that math anxiety negatively affects their grades, concentration in math classes, completion of math assignments, and participation in math-related activities. It impairs performance on math tests, memory recall, time management during tests, and influences career choices by leading to avoidance of math-intensive careers and doubts about success in math-related professions. The findings further highlight the psychological effects of math anxiety, including stress, physical symptoms, interference with relaxation and sleep, and feelings of depression or discouragement. However, participants also acknowledge the effectiveness of seeking help from professionals, using relaxation techniques, seeking support from family and friends, reframing negative thoughts, and practicing mindfulness or self-compassion in managing math anxiety. The regression analysis conducted on the factors associated with math anxiety among college students reveals significant findings. The factors contributing to math anxiety, the impact of math anxiety on students' performance, and coping strategies all show a significant positive effect on the Math Anxiety Rating Scale (MARS) score. This suggests that these factors play a crucial role in influencing math anxiety levels and negatively affecting students' performance in mathematics. However, effective coping strategies can help alleviate math anxiety. The intercept term indicates the presence of a baseline level of math anxiety among college students. The regression model collectively explains approximately 36.49% of the variability observed in the MARS scores, underscoring the importance of the factors considered in comprehending math anxiety. These findings enhance our understanding of math

anxiety among college students and emphasize the necessity for interventions that address and manage math anxiety in educational settings.

Conclusion

In conclusion, the analysis of the collected data provides valuable insights into the factors associated with math anxiety among college students and its impact on various aspects of their academic and psychological experiences. The findings reveal the prevalence of math anxiety and its influence on educational choices, test performance, numerical tasks, and completion of math assignments. External factors such as gender stereotypes, teacher interactions, and pressure to perform also contribute to math anxiety. Participants acknowledge the negative effects of math anxiety on grades, concentration, assignments, participation, test performance, memory recall, time management, and career choices. They also highlight the psychological symptoms associated with math anxiety. However, participants recognize the effectiveness of seeking help, employing coping strategies, and practicing mindfulness in managing math anxiety. The regression analysis confirms the significant positive effects of factors contributing to math anxiety, math anxiety's impact on performance, and coping strategies on the Math Anxiety Rating Scale (MARS) score. The model explains a substantial portion of the variation in the MARS scores, emphasizing the importance of these factors in understanding math anxiety among college students. These findings contribute to the existing knowledge on math anxiety and underscore the need for interventions to address and manage math anxiety in educational contexts.

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Affiliations and Corresponding Information

Princesita G. Timonera

Iligan Medical Center College – Philippines

Anna Fe J. Montebon

Iligan Medical Center College – Philippines

Julieto Payla

Iligan Medical Center College - Philippines