Covid–19 and Math Anxiety: Its Relationship to Mathematics Performance of High School Students

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ABSTRACT

COVID-19, formerly known as new coronavirus, has been reported in Wuhan, China, and is highly contagious via human-to-human transmission. The ongoing COVID-19 epidemic has resulted in global economic contraction owing to border closures, business closures, and even a shift in educational norms from traditional to blended learning. This blended learning encompasses the online and modular. As such, this study was undertaken to investigate the relationship between COVID-19 and Math Anxiety to the Grade VII students' Mathematics performance, as it is well known that many students regard Mathematics as a kind of mental torment rather than a topic of real-world relevance and value. The descriptive survey approach was used in this study, which involved 34 Grade VII – Gold students from MSU-Buug Laboratory High School. The COVID-19 procedure was followed, and data was collected via judgment sampling using a Google Survey form. The results indicated that Grade VII students' COVID-19 anxiety is "moderate," their Math anxiety is "moderate," and their Mathematics performance is "very good." Statistical analysis showed that there was no significant relationship between COVID-19 and Math anxiety to the Mathematics Performance of the Grade VII section Gold Students of MSU-BUUG Laboratory High School. It is suggested that parents encourage their children and seek assistance from instructors when necessary. To assist children learn at a distance, both instructors and parents must provide a firm foundation of support.

Keywords : COVID-19 anxiety, math anxiety, math performance

INTRODUCTION

It is on the year 2019 when the world has been tested with a highly contagious virus. This virus, known as coronavirus, is a broad family of viruses that can cause everything from a normal cold to more serious illnesses like Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). COVID-19 is first known as the novel coronavirus disease that started in Wuhan, China that has caused the world to shrink economically. Before it became famous for its name COVID-19, it was officially named as the Severe Acute Respiratory Syndrome Coronavirus 2 or SARS-CoV-2 by the International Committee on Taxonomy of Viruses. This virus is highly contagious that made globalization paused for a while since countries closed their borders to lessen the spread of the said virus.

The ongoing COVID-19 pandemic response requires rapid action from multiple sectors of the government and the society as well. In the new normal, the individuals need to adapt new behaviours and follow the implemented safety protocols. The government needs to implement new public measures such as observing 1–meter social distancing, wearing of face masks and face shields, washing hands with clean water and soap, and the use of disinfectants. Businesses need to develop new service strategies to operate differently as well as faith leaders in delivering sermons and holy masses since any form of mass gathering is highly prohibited to avoid close contacts among people. In line with this is the new adjustments in education, from face-to-face to online and offline modular.

As such, COVID-19 outbreak can have serious effects on people's mental health. People usually suffer from being stereotyped by others, feel helpless, fear of getting sick or dying, and anxious about losing livelihood. According to Salari et al., nervousness and anxiety affect people to a large extent. Knowing that this virus is highly contagious, its rate of spread and the resulting high mortality rate affect the individuals' mental health. This mental illness affect individuals at several layers of the society, from patients who are infected of the said virus, health workers in various sectors, patients with mental illness, and students. This pandemic makes the situation worse for the students since they learn from home. A new national survey from

the Understanding Coronavirus in America, the study found out that while parents of K-to-12 students generally think that instruction has not gone back to pre-COVID-19 quality, they were significantly more concern about Math than reading (Sawchuk & Sparks, 2020). Math is always formally taught in school but because of the pandemic, students learn Math at home. Parents are often less-equipped to help the students with this subject. The pandemic's broader stress and trauma may exacerbate some pupils' existing Math anxieties. In addition to the damage to their learning, many students have lost access to school-based treatments, resulting in a mental crisis. During the pandemic's education system, various issues and difficulties in teaching and learning Mathematics arise. This is in agreement with the study made by Gafoor and Kurukkan (2015) stated that students dislike mathematics because of difficulty in understanding the subject matter, teacher or instructional related factors. According to Lee-Chua (2012), how the students react towards Mathematics has always been a great concern in the Philippines. This has been a great challenge in the new normal since students ought to learn on their own with the guidance of the strategies implemented by the teachers to provide education despite the situation. In line with this, the researchers would like to determine the relation of COVID-19 and Math anxiety to the Mathematics performance of the high school students since learners are to learn by themselves guided by their parents at home. In relation to Mathematics performance, COVID-19 anxiety affects Mathematics performance in a way that it can either increase or decrease the performance level of the students.

METHODOLOGY
This study used the descriptive method of research specifically checklist designed that aimed to determine the relationships of COVID-19 Anxiety and Math Anxiety level to the Mathematics Performance of Grade VII Gold Students of Mindanao State University-Buug Laboratory High School.

The Grade VII students of Mindanao State University - Buug Laboratory High School were divided into three sections which are the Gold, Silver, and Copper and the respondents of this study are the Grade VII Gold students only who are officially enrolled in the school year 2020-2021 and currently taking Mathematics subjects.

The instrument used by the researchers in gathering the data was questionnaire-checklist divided into two, namely: the COVID-19 anxiety and the Mathematics anxiety of the respondents.
The following hypothetical weighted mean range was used according to the corresponding mean score of data obtained. For COVID-19 anxiety; 3 - Severe anxiety, 2 - Moderate anxiety, 1 - Mild anxiety. For Mathematics anxiety; 3 – Severe anxiety, 2 - Moderate anxiety, 1 - Mild anxiety.

The selection of the participants was done by judgment sampling. The researchers selected Grade VII Gold students to be part of this study based on their own existing knowledge that the first section is expected to be competitive. Aside from that, they are new from high school environment and then their modes of instruction was changed into blended learning approach. By that, researchers are expected that the selected respondents are very helpful in this study, that is, to determine whether or not COVID-19 and Math anxiety affected the participants' Mathematics performance.

The researchers send the letter asking permission from the principal of Mindanao State University-Buug Laboratory High School to conduct the study and gather data. Upon the approval, the researchers send a letter to the adviser and the subject teacher informing them about the study being conducted. After given permission by the principal and adviser to conduct the study, the researchers handed out the consent to the participants by the use of Facebook group chat and upon their willingness to be a participant of the study the researchers gave the questionnaire-checklist through Google survey form to participants. The third grading grades of the participants in Mathematics serve as their mathematics performance and these made available by the subject teachers.

RESULTS AND DISCUSSIONS
The discussions below present the analysis and interpretation of data gathered from the Grade VII students of Mindanao State University – Buug Laboratory High School who are officially enrolled during the school year 2020-2021 on the relationship of Covid-19 and Math anxiety to their Mathematics performance.

Table 1
Mathematics Performance of the Respondents

Academic Performance Range	Description of Academic Performance	Number of Students	
		Frequency	Percent (%)
75-83	Satisfactory	12	35.29
84-92	Very Satisfactory	16	47.06
93-100	Outstanding	6	17.65
Total		34	100
Mean		85.79	
Mean Academic Performance		Very Satisfactory	

Table 1 presents the Mathematics Performance of the students. About twelve (12) or 35.29% of the students have "satisfactory" mathematics performance, sixteen (16) or 47.06% of the students have "very satisfactory" mathematics performance, and six (6) of the students have "outstanding" mathematics performance. This shows that majority (47.06%) of the students "very satisfactory" mathematics performance, thus the mathematics performance of the respondents is "very satisfactory".

Table 2
Testing of Relationship between Covid-19 and Math Anxiety

			Math Anxiety			
			Low	Average	High	Total
Covid-19 Anxiety	Mild	Count	2	6	6	14
		% within Covid-19 Anxiety	14.3%	42.9%	42.9%	100.0%
	Moderate	Count	0	9	8	17
		% within Covid-19 Anxiety	.0%	52.9%	47.1%	100.0%
	Severe	Count	0	2	1	3
		% within Covid-19 Anxiety	.0%	66.7%	33.3%	100.0%
Total		Count	2	17	15	34
		% within Covid-19 Anxiety	5.9%	50.0%	44.1%	100.0%
$\chi^2 = 3.314$		$d.f = 4$	$p = 0.507$			

Table 2 shows the relationship between Covid-19 and Math anxiety. As reflected in the table, the test yielded to a Chi-square value of 3.314 with p value of 0.507 which implied to accept the null hypothesis at 0.05 level of significance. Therefore, it can be concluded from the results that there was no significant relationship between Covid-19 and Math anxiety.

Table 3
Testing of Relationship between Covid-19 Anxiety and
Math Performance

			Math Performance			
			Satisfactory	Very Satisfactory	Outstanding	Total
Covid-19 Anxiety	Mild	Count	5	4	5	14
		% within Covid-19 Anxiety	35.7%	28.6%	35.7%	100.0%
	Moderate	Count	7	10	0	17
		% within Covid-19 Anxiety	41.2%	58.8%	.0%	100.0%
	Severe	Count	0	2	1	3
		% within Covid-19 Anxiety	.0%	66.7%	33.3%	100.0%
Total		Count	12	16	6	34
		% within Covid-19 Anxiety	35.3%	47.1%	17.6%	100.0%
$\chi^2 = 8.996$		$d.f = 4$		$p - value = 0.061$		

The table shows the relationship between Covid-19 anxiety and Math performance. As reflected in the table, the test yielded to a Chi-square value of 8.996 with p value of 0.061 which implied to accept the null hypothesis at 0.05 level of significance. Therefore, it can be concluded from the results that there was no significant relationship between Covid-19 anxiety and Math performance.

Table 4
Testing of Relationship between Math Anxiety and
Math Performance

			Math Performance			
			Satisfactory	Very Satisfactory	Outstanding	Total
Math Anxiety	Mild	Count	1	0	1	2
		% within Math Anxiety	50.0%	.0%	50.0%	100.0%
	Moderate	Count	6	8	3	17
		% within Math Anxiety	35.3%	47.1%	17.6%	100.0%
	Severe	Count	5	8	2	15
		% within Math Anxiety	33.3%	53.3%	13.3%	100.0%
Total		Count	12	16	6	34
		% within Math Anxiety	35.3%	47.1%	17.6%	100.0%
$\chi^2 = 2.550$		$d.f = 4$		$p - value = 0.636$		

The table shows the relationship between Math anxiety and Math performance. As reflected in the table, the test yielded to a Chi-square value of 2.550 with p value of 0.636 which implied to accept the null hypothesis at 0.05 level of significance. Therefore, it can be concluded from the results that there was no significant relationship between Math anxiety and Math performance.

Table 5
Testing of Relationship between Covid-19 and Math Anxiety and
Math Performance

			Math Performance			
			Satisfactory	Very Satisfactory	Outstanding	Total
Covid-19 and Math Anxiety	Mild	Count	3	1	2	6
		% within Covid-19 and Math Anxiety	50.0%	16.7%	33.3%	100.0%
	Moderate	Count	8	12	4	24
		% within Covid-19 and Math Anxiety	33.3%	50.0%	16.7%	100.0%
	Severe	Count	1	3	0	4
		% within Covid-19 and Math Anxiety	25.0%	75.0%	.0%	100.0%
Total		Count	12	16	6	34
		% within Covid-19 and Math Anxiety	35.3%	47.1%	17.6%	100.0%
$\chi^2 = 3.955$		$d.f = 4$		$p - value = 0.412$		

The table shows the relationship between Covid-19 and Math anxiety and Math performance. As reflected in the table, the test yielded to a Chi-square value of 3.955 with p value of 0.412 which implied to accept the null hypothesis at 0.05 level of significance. Therefore, it can be concluded from the results that there was no significant relationship between Covid-19 and Math anxiety and Math performance.

CONCLUSIONS

Based on the data and computations obtained, the researchers found out that the level of COVID-19 anxiety of the Grade VII Gold students is "moderate". Also, the level of Math anxiety of the Grade VII Gold students is "moderate". It shows that the Grade VII Gold students' mathematics performance is "very satisfactory". Therefore, there is no significant relationship between COVID-19 and Math Anxiety to the Mathematics performance of the Grade VII Gold students of MSU-Buug Laboratory High School.

RECOMMENDATIONS

Based on the foregoing findings and conclusions, the following recommendations are advanced:

1. It is therefore recommended that COVID-19 anxiety be properly acknowledged by the teachers, the parents, and the students.
2. There must also be a strong foundation of encouragement to eradicate Math anxiety especially during this distant learning.
3. Parents and teachers must help the students to appreciate Mathematics to learn to see the significance of Mathematics in their everyday living and grow on perspectives in connection with the application of Mathematics in a real-life context.
4. For the less-equipped parents, they must seek help from the teachers when needed so it would be easier for them to guide their children in learning the subject.
5. To validate the major findings of this study, it is further recommended that other researchers may conduct similar studies with bigger scope to strengthen the findings of this study.

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