Perceived Stress During Covid-19 Pandemic: Its Relationship To The Academic Performance Of Students

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Abstract. This study investigated the relationship between the COVID-19 perceived stress levels and the Science academic performance of the 3rd year secondary Science education students of MSU-IIT for the academic year 2020-2021. The researchers adopted a quantitative purposive sampling method with a total sample of seventy-five (75) students. Results showed that students experienced high levels of COVID-19 perceived stress. The emotional stress domain was the most experienced wherein feelings of anxiety, irritation, forgetfulness and disorganization, sweaty palms, and sleeping problems were the common stress indicators. Moreover, the perceived stress indicators were almost always experienced throughout the academic year 2020 - 2021. Lastly, the study found no credible evidence supporting the correlations between the students' Science academic performance and COVID-19 perceived stress levels. Further research is recommended with a larger sample size for more relevant results. The researchers also suggest that university administrators provide online mental health consultations and time management webinars to help improve academic performance and minimize stress.

Keywords: Academic Performance, COVID-19 Perceived Stress, Undergraduate Students

1 Introduction

The coronavirus pandemic rapidly swept around the world and caused a physical and emotional toll due to the abrupt lifestyle change. While the majority of schools and colleges have moved to online class delivery and evaluation to avoid disruptions in educational services, the digital learning platform is still uncharted territory. Currently, the use of digital resources, particularly in mainstream education, has remained largely unexplored. College students doing "flexible learning," or a combination of online and offline programs, scramble to acquire digital devices and a stable internet connection. The disparity of access becomes a harbinger of academic stress in students who would find themselves unable to avail online classes or submit their assignments, thus falling behind their peers in their curriculum. This has led to reports of symptoms of depression, anxiety, and in severe cases, suicidal attempts in children and

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adolescents triggered by academic stress and apprehensions regarding the future (Fegert et al., 2020). This study identified which major stressors associated with the COVID-19 pandemic affect the students the most. This is to understand the level of manifestation and relationship to the student's academic performance, which refers to the average Science course grades of a 3rd-year undergraduate student, and determine how these stressors manifest in a student on an academic-year basis. This could help in the early recognition of those students who require tailored intervention to foster their well-being. Specifically, this study aims to answer the following problem: (1) What is the level of COVID-19 perceived stress experienced by the following programs; (a.) 3rd year BSEd Biology, (b.) 3rd year BSEd Chemistry, (c.) 3rd year BSEd Physics? (2) Which stress domains and stress indicators manifest the most in the student's well-being? (3) How often do the stress indicators affect a student's well-being on an academic year basis? (4) What is the relationship between the level of perceived stress experienced by the Junior Science Education undergraduate (BSEd Biology, BSEd Chemistry, BSEd Physics) students towards their average grade in the following courses; (a.) Analytical Chemistry, (b.) Cell and Molecular Biology, (c.) Waves and Optics.

2 Methods

The study used a quantitative research method to systematically investigate the gathered quantifiable data and performed statistical techniques to satisfy the research problems. The researchers employed a correlational research design to ascertain the magnitude of the relationship between the two variables, namely the level of perceived stress due to the COVID-19 pandemic and the significant relevance to the respondents' science academic performance. The researchers chose a specific sample group that suited the study's needs: the 3rd Secondary BSEd Chemistry, BSEd Biology, and BSEd Physics students. The study had a total of seventy-five (75) respondents; thirty-two (32) came from BSED- Chemistry, twenty (20) from BSED-Biology, and twenty- three (23) from BSED-Physics programs. These respondents were enrolled in the Analytical chemistry lecture, Cell and Molecular Biology lecture, and Waves and Optics lecture during the academic year 2020- 2021. A modified-adapted questionnaire was utilized for data gathering, via purposive sampling, with 32 items on a 4-point Likert Scale. It was sectioned into four parts: the demographic profile of the student and their GPA, the Level of COVID-19 Stress, the Perceived Effects of COVID- 19 Stress, and the Frequency of Perceived COVID-19 Stress. Each item was developed to cover domains that could have been subject to variations due to the COVID-19 pandemic lockdown, and, therefore, that may be potentially perceived as sources of stress (i.e., risk of contagion; social isolation; relationship with colleagues; relationship with professors; academic studying; romantic and family relationship). The questionnaire included the: (A) Demographic Profile of the respondent; (B) Level of COVID- 19 Stress Scale (CSSQ) was a modified questionnaire from Zurlo et al., 2020. This was developed to measure the psychological impact of COVID-19 in terms of danger and contamination fears; fears about economic consequences, xenophobia, compulsive checking and reassurance-seeking, and traumatic stress symptoms. The instrument specifically addressed the impact of the COVID- 19 outbreak in terms of psychological outcomes without addressing and identifying specific sources of stress related to relational and daily life changes induced by the COVID-19 pandemic lockdown. The 6-item questionnaire was based on three factors, Relationship and Academic Life, Isolation, and Fear of contagion; (C) The Perceived Effects of

COVID-19 Stress Scale four domains of stress indicators identified in this study namely; behavioral, cognitive, emotional, and physiological stress Indicators. Each domain had four stress indicators, respectively, which were sourced through a preliminary survey, and was answered using a 4-point Likert scale. Each domain's stress indicators were then ranked according to the highest average computed; (D) The Frequency of Perceived Stress Scale questionnaire is a modified stress assessment instrument from Stanley Cohen. Data was collected online by utilizing google forms.

3 Results And Discussion

This study examined the level of perceived stress experienced by the 3rd year BSEd Science students. Presented also in the study are the stress domains and stress indicators that manifested the most in the students. Including how often these stress factors affect the students on an academic year basis, and the relationship between the perceived level of stress towards the science academic performance of the students.

Level of Perceived Stress among 3rd year BSEd Biology, BSEd Chemistry, and BSEd Physics students.

Table 1 Perceived Stress Level of 3rd Year BSEd BSED Biology, BSED Chemistry, and BSED Physics students

	STATEMENTS	Program			Interpretation (average)
		BSED-Biology	BSED-Chemistry	BSED-Physics	
1	How do you perceive the risk of contagion during this period of COVID-19 pandemic?	2.90	2.97	2.61	High
2	How do you perceive the condition of social isolation imposed during this period of COVID-19 pandemic?	2.60	2.86	2.83	High
3	How do you perceive the relationships with your relatives during this period of COVID-19 pandemic?	2.15	2.41	2.22	Low
4	How do you perceive the relationships with your university colleagues during this period of COVID-19	2.25	2.63	1.91	Low

	pandemic?				
5	How do you perceive the relationships with your university professors during this period of COVID-19 pandemic?	2.65	2.75	2.39	High
6	How do you perceive your academic studying experience during this period of COVID-19 pandemic?	3.10	2.03	2.87	High
		2.61	2.78	2.47	High

Legend: 1-1.75 (Very Low); 1.76-2.5 (Low); 2.51-3.25 (High); 3.26-4 (Very High)

Students from BSEd Biology and BSEd Chemistry showed high levels of induced COVID-19 perceived stress. This is in contrast to the average mean score of the students from BSEd Physics which implies that they experienced low perceived stress levels. Overall (Table 2), the results showed that the students have high perceived stress towards the fear of contagion, isolation, relationship, and academic life. Fear contagion had the highest mean among the three factors. This implied that this stressor had the highest contribution to respondents' stress levels.

Table 2 Summary of Perceived Stress Level among 3rd Year Science Education students

COVID-19 Stress Factors	Biology	Chemistry	Physics	Mean	Interpretation
Fear of Contagion	2.90	2.97	2.61	2.83	High
Isolation	2.60	2.89	2.83	2.77	High
Relationship and Academic Life	2.54	2.71	2.35	2.53	High
AVERAGE	2.68	2.86	2.60	2.71	High

Legend: 1-1.75 (Very Low); 1.76-2.5 (Low); 2.51-3.25 (High); 3.26-4 (Very High)

The first COVID-19 stress factor is fear of contagion. It bears the highest mean (2.83), which interprets a high level of stress among the 3rd-year Science Education students. With the continuous rise of COVID-19 cases in the Philippines, it is evident that the fear of contagion is clouding the minds of most respondents, as the data shown in table 2. In line with this, one study

recorded that more than one-third of their participants reported fear of contagion for themselves, and two-thirds reported fear for family members (Cori et al., 2021) which could probably mean that fear is linked with stress and anxiety. The second COVID-19 stress factor is isolation. Results show a high level (2.77) of stress among the 3rd year Science Education students. Zhong et al. (2021) sustained that social interaction and relationships are essential for mental well-being throughout the lifespan. Thus, its absence due to the COVID-19 pandemic can significantly affect the lives of individuals. Similarly, Stevens (1997) discussed that friendships could foster a sense of well-being and self-esteem within the lifespan. Corollary to this, Umberson and Montez (2010) concluded that social relations influence health over the lifespan. Consequently, social isolation contributes to stress.

The last COVID-19 stress factor is relationships and academic life. Based on the results, it has the lowest mean (2.53) among the other factors; however, it implies that there was a high level of stress among the 3rd year Science Education students. Under this factor is the academic studying experience of the respondents during the pandemic, which was discussed from the previous tables 1, 2, and 3 bearing the highest mean. Upon categorizing, the mean of the four questions was calculated, resulting in a much lower mean (2.53) than the other factors. Nevertheless, this implies that there is a high level of stress among the 3rd year Science Education students. This is supported by Cao et al. (2020), stipulating that 25% of their respondents experienced anxiety symptoms due to the impact of COVID-19 on students' education and well-being. Such finding is similar to the present study, which shows a high level of stress on their academic endeavors. The results gave an insight that academic life and relationships with family, colleagues, and friends have a significant relation to each other; thus, balancing the two equally essential things may reduce stress and make it more bearable during difficult times.

Stress domains and Stress indicators that manifest the most in the 3rd year BSED Science Education students' well-being.

A. Emotional Stress

Two of the emotional stress indicators on the list have the highest mean score (3.15): anxiety and irritation. The result is consistent with the study conducted by Huang and Zhao (2020), which stated that anxiety, one of the main evaluated subjects, has been significantly increasing in society during this pandemic. Li et al. (2020) added that he found an increase in words that mirror negative emotions, including anxiety, depression, and anger.

B. Cognitive Stress

The result shows forgetfulness and disorganization have the highest mean (3.33) among the other stress indicators. Forgetfulness or memory loss that disrupts daily life may be a symptom of Alzheimer's or other dementia (WHO, 2021). Moreover, poor concentration, mental blocks, and overthinking are top listed as cognitive stress indicators manifested by students during the pandemic. Overthinking is one of the most mentioned stressors in social media today; loneliness triggers overthinking.

B. Physiological Stress

The result shows that sweaty palms have the highest mean score (3.23) among the other physiological stress indicators. Sweaty palms, as experienced by many, once become

uncontrollable, may develop into a medical condition called palmar hyperhidrosis. This is a highly stressful, embarrassing, and confidence-wrecking problem and is reported to negatively impact social life, education, and career (SweatHelp Organization, 2020). Furthermore, the last stressor on the list is experiencing fatigue. Fatigue is more than just tiredness. Hans et al. (2003) defined fatigue as a physiological state of reduced mental or physical capability, which may develop due to sleep loss or extended wakefulness, disrupted circadian rhythm, or increased workload.

C. Behavioral Stress

In the ranking of behavioral stress indicators, the result showed that sleeping problems (3.21) is the highest indicator manifested by the students. The high prevalence of sleep problems found in the present review can be explained by fear of COVID-19 and sleep- related factors, such as the changes in sleep-wake habits with delayed bedtime, lights off time, and sleep onset time due to quarantine and lockdown (Alimoradi. et al., 2021). It demonstrated that individuals might experience sleep problems when they experience major public health threats. Moreover, the next on the list is experiencing changes in eating and drinking habits and difficulty completing tasks. Unlike previous academic years, online learning modality required students to stay and attend classes at home; some say they even lost track of time to eat. Lastly is excessive crying, which is associated with anxiety and stress.

Manifested Stress Domains of the 3rd year Science Education Students

The study also showed that among the stress domains, emotional stress had the highest mean score followed by cognitive stress, physiological stress, and behavioral stress. This corresponds to emotional stress indicators in the domain being the most experienced by the respondents among other domains.

Person-environment fit theory focuses on the interaction between the individual's characteristics and the environment, suggesting a reciprocal relationship between people and environments (Holland, 1997). In line with the theory, the results reveal that the three primary environments of a person: home, peer, and school, were vividly seen as stressors contributing to a high level of stress in the 3rd-year Science Education students. When not appropriately managed, chronic stress leads to emotional and psychosomatic consequences. It manifests through physical, cognitive, and emotional exhaustion and depersonalization, resulting in lowered academic efficiency (Wirkus et al., 2021). As noted by Walter Mischel, one cannot take a person out of personality, but, at the same time, one cannot ignore the fact that environments influence behavior and well-being.

Frequency of Stress Indicators affecting the student's well-being on an academic year basis

Table 3 shows the frequency of the stressors experienced by the respondents during the academic year 2020-2021. According to the results, during the academic year 2020-2021, students were almost always upset because of something unexpected that happened. They were almost always angered because of the instances outside their control, almost always felt that they were unable to control the important things in their respective lives, and almost always felt that difficulties were piling up so high and that they could not overcome them anymore.

Similarly, the results also showed that the students are almost always feeling nervous and stressed, and found that they could not cope with all the things they had to do. Additionally, the

respondents almost never felt that things were going their way and almost never felt that they were on top of things. Various studies have shown that the mental health of the population is significantly affected when faced with public health emergencies, and university students are no exception to this fact. This showed similar results with a study by Malik & Javed (2021) which showed that COVID-19 induced online learning has a negative impact on the mental health of university students in terms of perceived stress. However, despite the circumstances, results also showed that students almost always felt confident about their ability to handle personal problems and almost always have been able to control irritations in their life for the past academic year. This is similar to what the Stress Buffering Model by Pressman & Cohen (2005) suggested that participants who reported higher stress have a stronger association with higher positive affect. The students pose a high sense of control of themselves and not be swayed by the negative effects of stress.

As previously discussed, stress is the body's response to pressure (Mental Health Organization, 2021). It is our body's fight-or-flight response to any challenges encountered that cause a disturbance to the overall well-being of the individual. In relation to our study, we are all aware of the recent changes in the educational setting to cope with the pandemic. To ensure teaching and learning continuity, higher education institutions transitioned to flexible teaching and learning modalities that significantly caused a shift in the students' academic well-being. The MHO discussed that sometimes, this stress response can be useful: it can help push through fear or pain and overcome any hurdles. The stress hormones will usually go back to normal quickly once the stressful event is over, and there won't be any lasting effects. However, too much stress can cause negative effects. It can leave a permanent stage of fight or flight, leaving the overwhelmed or unable to cope. In the long term, this can affect physical and mental health. Furthermore, the stressor–strain theory (Fox, Spector, & Miles, 2001; Spector, 1998) posits that frequent exposure to stressors can negatively impact individuals' health, resulting in behavioral, physical, or psychological strains (Jex & Beehr, 1991).

Tabel 3 Measure of Relationship between the Perceived Stress Level and Student's Science Grade

Independent Variable	Dependent Variable (Academic Performance)	Correlation Coefficient	Significance Value	Remark
Perceived Stress Level Experienced	Analytical Chemistry	0.219	0.059	Not significant (Very weak positive correlation)
	Cell and Molecular Biology	0.192	0.099	Not significant (Very weak positive correlation)
	Waves and Optics	-0.083	0.479	Not significant (Negative correlation)

H0: There is no significant relationship between the perceived stress and the science academic performance of 3rd year BSEd Science students during the Covid-19 pandemic.

The independent variable, the COVID-19 perceived stress level experienced by the students, showed a statistically nonsignificant relationship with the students' grades in Analytical Chemistry, Cell and Molecular Biology, and in Waves and Optics, and is not substantial with

the correlation coefficient values of 0.219, 0.192, and -0.083, respectively. With no sufficient statistical proof that the variables have an association with each other, the alternate hypothesis is rejected. This finding concurs with similar results by Awofodu & Emi (2011). Their correlation of respondents' scores on the stress scale with their Grade point average shows that there is no relationship between the amount of stress perceived by biology students and their Grade point average. A study by Womble (2003) was also unable to show a significant correlation between the students' amount of perceived stress in a given semester and their GPAs. Thus, the study retains the null hypothesis stating that there is no significant relationship between the perceived stress and the science academic performance of 3rd year BSEd Science students during the Covid-19 pandemic. This result is supported by various studies suggesting that interactions between personality and environmental factors are a rather complex process, implying that academic achievement can be achieved in quite diverse ways (Usman & Madudili, 2019; Hayat & et al., 2020). Womble (2003) also suggested that survey population size also plays a role in gaining these results, thus a higher population size is recommended. A common misconception among the general public is that a higher stress level would pose a negative impact on the students' GPA. However, laboratory research findings from the University of California, Berkeley showed that as acute stress happens on a regular basis, it will keep the animal more alert. This implies that stress can be something that makes an individual better. Professor Kaufer, head researcher at UC Berkeley, further suggested that certain amounts of stress are good for achieving optimal alertness and behavioral and cognitive performance (Sanders, 2015). It is also worth noting that education- based initiatives that focus on increasing students' skills and ability to cope with stress have been previously demonstrated to directly and positively influence educational achievement and decrease health risks (Hanson & Austin, 2002; Perry et al., 2017; Weare & Gray, 2003).

4 Conclusion And Recommendation

This study examined the relationship between COVID-19 perceived stress and the students' science academic performance. The study has ranked the top-provoking indicators of COVID-19-induced stress and its frequency among the secondary science education students of Mindanao State University - Iligan Institute of Technology. However, the present study was unable to provide statistical proof for a significant relationship between the two factors. But the proportions of the stress levels, stress factors, and the frequency of the perceived stress were relatively high. This calls for changes in measures to increase students' stress management skills and abilities and social changes relating to the COVID-19 response. Understanding the source of the different stress domains would enable professionals in the field to tailor-make interventions for students by combining the most effective strategies. Improving a student's holistic well-being would eventually be beneficial not just to the individual but also to the total productivity of the institution.

The researchers would like to recommend that similar studies may be conducted with a large-scale population to statistically analyze and obtain a more precise interpretation. The initial limitation of students who are reluctant to provide their grades or might have manipulated their actual grades can be overcome by confirming the data from their respective advisers. Furthermore, the researchers also suggest that the university may consider offering online services such as time and stress management to help students manage their time wisely and

coping strategies through counseling programs for students during their studies. Such strategies would probably empower university students to manage stress and may prove beneficial. Lastly, further research focusing on developing and evaluating the effects of stress-reducing strategies among students is also recommended.

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