

<https://doi.org/10.33472/AFJBS.6.9.2024.175-182>

African Journal of Biological Sciences

Journal homepage: <http://www.afjbs.com>

Research Paper

Open Access

Serotonin and Dopamine Dysregulation: Unveiling the Toll of COVID-19 on Mental Health among Teachers in Marawi City, Philippines

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Article Info

Article History
Volume 6, Issue 9, 2024
Received: 11 Mar 2024
Accepted: 04 Apr 2024
doi: 110.33472/AFJBS.6.9.2024.175-182

Abstract

Introduction

The emergence of COVID-19 has created an abnormal, this viral disease was swiftly recognized as a public health emergency of international concern. and declared a pandemic by the World Health Organization.

Purpose

This study aimed to gain a deeper understanding of how COVID-19 impacted their emotional health and overall well-being, hoping to guide early interventions.

Methods

The research utilized standard questionnaires and employed descriptive, correlational, and predictive designs, geared towards expanded information and in-depth understanding of COVID-19's impact on negative emotional and physical health, for early interventions and manifestations.

Results

The findings showed that, according to mean and grand mean analyses, the teachers reported very low levels of depression, anxiety, stress, and negative emotional health, but fair status of well-being. However, digging deeper through cumulative percent anal Nevertheless, with focus on the cumulative percent analysis, it is revealed that a small percentage possessed high-to-very high levels of negative emotional health (6.2%) and poor-to-very-poor well-being status (25.8%), indicating a pressing need to address mental well-being concerns among teachers. But it's noteworthy that the large majority - 93.8% for emotion and 74.2% for well-being - displayed remarkable resilience amidst the challenges posed by the pandemic. Correlation analyses revealed that there were significant negative relationships existing between depression, anxiety, and stress levels (negative emotional health) and overall well-being status; concluding lower levels of these negative emotions correlate with a sounder well-being impact. Moreover, when it came to predicting well-being by negative emotional components, depression emerged as the primary predictor, accounting for about 16.42% of the variance, followed by stress at 15.76%, then anxiety at 5.86%.

Conclusion

In conclusion, most Marawi Filipino teachers perceive very low levels of depression, anxiety, stress, and negative emotional state amidst the COVID-19 pandemic, and this suggests a certain level of resilience and coping strategies among the respondents.

Keywords: Mental health, Well-being, Unveiling toll, Teachers, Marawi City

Introduction

The emergence of COVID-19 has created an abnormal, yet often referred to as the "new normal," scenario. Originating in Wuhan, China, in December 2019, this viral disease was swiftly recognized as a public health emergency of international concern in January 2020 and later declared a pandemic by the World Health Organization on March 11, 2020. COVID-19 is characterized by its rapid spread and highly infectious nature, posing significant challenges worldwide. Despite ongoing efforts, there are currently no fully effective vaccines or cures resolved, leaving the global population grappling with its impact.

COVID-19 has speedily crossed borders, infecting people throughout the entire world (Ma et al., 2020). Amidst the ongoing COVID-19 pandemic, there has been a surge in emotional, psychological, and mental well-being challenges experienced by people worldwide. Individuals are grappling with fears of contracting the virus, mourning the loss of loved ones, facing economic hardships, and uncertainties about the future (Das et al., 2011). Furthermore, Iris et al. (2020) emphasized the World Health Organization's recommendation for social distancing as a crucial measure to curb the rapid spread of the disease and prevent overwhelming healthcare systems globally, ultimately reducing the loss of lives (Singhal, 2020). Preventive measures were established to the extent of sacrificing peoples' mobility and depriving human rights.

In the Philippines, in five months, almost two hundred thousand COVID-19 cases were confirmed and posted more than three thousand deaths: the largest from the National Capital Region. Moreover, the National Task Force (NTF) Against COVID-19 was alarmed by the increase in the number of suicides suffering from depression due to loss of employment or livelihood, anxiety of being afflicted with or dying from the dreaded disease, loneliness arising from isolation, and lack of hope for a return to their normal lives (WHO Philippines COVID-19 Situation Report 50, 2020). The Department of Education even conducted nationwide psychosocial support sessions and other related activities a week before the October School opening, recognizing how the COVID-19 pandemic affected the mental well-being of students (WHO Philippines, 2020).

Certainly, the educational landscape has been significantly impacted by the onset of the COVID-19 pandemic. The swift transition from traditional face-to-face instruction to various forms of remote learning, such as online formats or modular

learning, acknowledges the difficulties parents, teachers, and students have been adjusting to this new setting for learning and has been crucial in ensuring the safety of both students and teachers while mitigating the spread of the virus. Nevertheless, there have been inherent challenges associated with these new flexible learning modalities, as highlighted by Isla (2020). The absence of physical interaction among students and teachers during schooling has resulted in notable adverse effects, outweighing the benefits, as emphasized by Northenor (2020).

Aligned with this trend, there has been a proliferation of research focusing on education during the COVID-19 pandemic. These studies reveal that students are grappling with heightened levels of stress, anxiety, and depression (Aslan et al., 2020). Additionally, negative emotions such as fear, worry, and boredom have been reported to intensify among students (Aristovnik et al., 2020; Son et al., 2020). It is noted that stress can significantly impact students' academic performance (Sohail, 2013) and contribute to the development of various mental and psychosomatic symptoms, including dissatisfaction, restlessness, difficulty concentrating, and sleep disturbances (Herbst et al., 2016). Most of the studies primarily focus on students and tend to be descriptive.

While descriptive research offers a rapid method of transforming information into knowledge by detailing phenomena, there is a rational need to expand into broader perspectives and employ more scientific methodologies. The ramifications of the COVID-19 pandemic necessitate a broader scope of research, delving into specificities and employing scientific approaches to uncover multi-variate correlations and predictions, thus enriching knowledge and understanding. In the context of education, where teaching and learning are intertwined, if the focus has been on studying students as constructs, it becomes imperative to also explore teachers as designers considering the concerns posed by the COVID-19 pandemic. Moreover, examining unique locales affected by siege warfare before the pandemic, such as Marawi City, Philippines, is rare and may represent a groundbreaking endeavor.

Among these considerations, the researcher is greatly motivated to undertake a study on the broader impact of the Covid-19 pandemic, particularly focusing on the negative mental states of depression, anxiety, and stress, as well as overall well-being among teachers at Mindanao State University, Marawi City, within the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM), Philippines. This study aims to provide descriptive insights, analyze the strength and direction of relationships between correlated variables, and ascertain the

predictive accuracy of significant established relationships.

COVID-19 Pandemic

The coronavirus, originating in Wuhan, China in December 2019, is a highly infectious communicable disease posing a significant threat to public health and safety, as highlighted by the World Health Organization). Designated as a Public Health Emergency of International Concern by WHO within a month of its outbreak, COVID-19, caused by the novel coronavirus SARS-CoV-2, has led to a global pandemic of respiratory illness (WHO, 2020; Ma et al., 2020; Sauer, 2020).

The parallels with the 2003 SARS outbreak, underscore the severity of the current COVID-19 pandemic, which profoundly impacts global and mental health (Torales et al., 2020; Xiang et al., 2020). While most infected individuals experience mild to moderate respiratory symptoms, older adults and those with underlying medical conditions are at higher risk of developing severe illness (WHO, 2020).

The COVID-19 pandemic, reaching every continent except Antarctica, has tragically resulted in over a million deaths, highlighting its status as a defining global health crisis (Ma et al., 2020). Beyond its immediate health implications, the pandemic has triggered a socio-economic crisis affecting countries worldwide, as emphasized by the UNDP (2020). Moreover, as Perrin et al. (2009) illustrate, pandemics pose significant threats not only in terms of pathophysiological mechanisms but also in terms of psychological and behavioral reactions within affected populations. Thus, Covid-19 represents not only a health crisis but also a socio-economic and psychological challenge of unprecedented proportions.

Impact of Covid-19 on depression, Anxiety, and Stress

The COVID-19 pandemic has profound implications for mental health, including depression, anxiety, and stress, which encompass emotional, cognitive, behavioral, social, and psychological well-being (Felman, 2020). Mental health is emotional, psychological, and social well-being, influencing thoughts, feelings, and actions, and aiding in stress management, interpersonal relationships, and decision-making. The Philippines responded to the pandemic with community quarantine measures, leading to increased anxiety and stress among the population (WHO, 2020). This outbreak has global implications for mental health, resulting in a range of issues such as depression, anxiety, insomnia, and anger (Torales et al., 2020). However, these mental health challenges are less visible than the physical symptoms of COVID-19 (Nortajuddin, 2020).

The pandemic presents unprecedented threats to psychological well-being, necessitating tailored interventions for vulnerable groups (Salari et al., 2020). Vulnerable populations are particularly susceptible to emotional distress, fear, and societal behaviors driven by uncertainty (Shigemura et al., 2020). Studies conducted in China highlight gender differences in post-traumatic stress symptoms and the impact of sleep quality on mental health (Liu et al., 2020). Furthermore, research shows elevated levels of stress among healthcare workers treating COVID-19 patients (Srivastav et al., 2020).

Preliminary evidence suggests common psychological reactions to the pandemic, including anxiety, depression, and stress (Fadare et al., 2022a; Rajkumar, 2020). Representative research from various affected countries, particularly focusing on vulnerable populations, is needed to fully understand the mental health implications of the pandemic (Rajkumar, 2020). Additional studies reveal moderate-to-high levels of perceived stress and mental health problems among respondents (Yali et al., 2020). The DASS-21 questionnaire proves effective in assessing depression, anxiety, and stress levels during the pandemic (Tee et al., 2020), revealing high prevalence rates of these mental health issues among respondents.

Well-being amidst COVID-19 Pandemic

The COVID-19 crisis has visibly altered various aspects of life. While the full extent of its impact on human well-being remains to be thoroughly examined, an increasing number of expert opinions and public discussions suggest that as the pandemic persists, certain populations are more susceptible to experiencing declines in mental well-being. Encountering stress and anxiety during a pandemic can exacerbate pre-existing mental well-being states (Tkáčová et al., 2021).

A study on "The effects of coronavirus disease 2019 (COVID-19) on the population's mental health and well-being" is expected to reveal significant and enduring effects. A survey involving 3077 adults in the UK conducted at wave 1 found an increase in suicidal ideation over time. While symptoms of anxiety and levels of defeat and entrapment decreased across waves, levels of depressive symptoms remained largely unchanged. Positive well-being also showed an increase. Levels of loneliness did not exhibit significant changes across waves. Subgroup analysis revealed that women, young people aged 18-29, individuals from socially disadvantaged backgrounds, and those with pre-existing mental health issues faced worse mental health outcomes during the pandemic across various factors. The mental health and well-being of the UK adult population seem to have been impacted during the initial phase of the COVID-19 pandemic. The escalating rates of suicidal thoughts across

waves, particularly among young adults, are concerning (O'Connor et al., 2021).

The United Nations World Health Organization has expressed alarm over the mental well-being situation in Southeast Asia and urged countries in the region to prioritize it (Vatican News, 2020). Consistent with this, psychological research indicates that during periods of social distancing, quarantine, or isolation, individuals may experience fear, anxiety, depression, and boredom. Bishop David also emphasized the importance of mental well-being, noting that stress, depression, and trauma were exacerbated by the crisis caused by community quarantine (Vatican News, 2020).

Similarly, Panchal et al. (2020) found in their study that many adults reported specific negative impacts on their mental health and well-being, such as difficulty sleeping or eating, increased alcohol consumption or substance use, and worsening chronic conditions due to worry and stress over the coronavirus (Fadare et al., 2022b). As the pandemic persists, current and necessary public health measures expose many individuals to situations linked to poor mental health outcomes, such as isolation and job loss. Moreover, the pandemic can adversely affect mental well-being as it spreads to different communities. It is crucial to safeguard individual's mental health and implement psychological interventions to support vulnerable groups during the pandemic (Salari et al., 2020).

Ultimately, COVID-19, with its potential for multiple peaks and waves, has already had and is likely to continue to have profound impacts on the day-to-day well-being of individuals. Early indicators suggest that the most stressful aspects of COVID-19 include learning about the severity and contagiousness of the virus, uncertainty about the duration of quarantine; and requirements for social distancing (Rashid and McGrath, 2020).

Methodology

Research Design.

This research employs a descriptive, correlational, and predictive design. Descriptive research, which can be qualitative or quantitative, is utilized to depict the current situation. Specifically, quantitative descriptive research aims to present information without delving into causal relationships. Descriptive statistics are utilized to describe phenomena rather than infer cause and effect. This approach is applicable across various disciplines and provides a swift method to transform data into knowledge. In this study, descriptive analysis focuses on the Independent Variables of

depression, anxiety, and stress, as well as the Dependent Variables of physical health. Correlational research design is implemented to investigate the strength, direction, and existence of relationships between Independent and Dependent Variables using correlation coefficient statistics (r). Predictive design is employed to ascertain the predictive accuracy of the relationship between Independent and Dependent Variables through determination coefficient statistics (r^2). This aspect of the research seeks to determine the extent to which Independent Variables predict outcomes on criterion variables.

Population of study

The study's population consisted of secondary teachers at the MSU-University Training Center (UTC), Marawi, Philippines who were officially teaching subjects during the academic year 2022. The MSU-UTC utilizes a modular flexible learning approach. A population of 102 teachers, composed of 81 females and 21 males were invited, but the final number of respondents who willingly participated was 97, resulting in a retrieval rate of 95.10%. The researcher employed a complete enumeration sampling technique, facilitated by the university authorities on campus. Unlike random sampling, complete enumeration ensured that all eligible respondents within the campus, utilizing the modular flexible learning approach, had the opportunity to participate in the study. This approach enabled the researcher to gather the maximum feedback and reliable results regarding the impact of the COVID-19 pandemic.

Research Instruments. This research gathered data via face-to-face intercept using two (2) standardized self-rated research questionnaires, the DASS-21, and the WHO-5 Well-being Index. The DASS-21 questionnaire is developed by consultant clinical psychologist Fernando Gomez, a 21-item self-report tool designed to gauge negative emotional states of depression, anxiety, and stress, of reliabilities 0.94, 0.87, and 0.91, respectively (Anthony et al., 1998). The WHO-5 Well-Being Index is a short self-reported 5-item questionnaire developed by the World Health Organization to measure mental well-being of consistent reliability $\alpha = 0.90$ (Halliday et al., 2017).

Data Collection Procedures.

This section outlines three key stages: preliminary, actual data collection, and post-data management. Driven by accreditation requirements, the study investigates the impact of COVID-19 on elementary and secondary level teachers at Mindanao State University- Marawi, Philippines encompassing both laboratory and external campuses employing modular flexible learning modalities. Before data collection commenced, the researcher submitted a letter request to the President of the Mindanao State University System (MSUS) through the Vice Chancellor for Academic Affairs (OVCAA), seeking authorization to conduct

the study and procure the faculty list, particularly for in-campus MSU-ILS elementary and secondary level teachers, through physical data gathering. Following approval, an Intent Letter was sent to the head/director of MSU-ILS requesting permission to conduct the study, along with the approved OVCAA copy. Subsequently, research assistants were instructed on the immediate distribution and retrieval possible, of the coded Respondents' questionnaires, accompanied by a Respondents' Letter-Request. Upon questionnaire retrieval, respondent answers were tabulated using a quantification of data form in Microsoft Excel, ready for data analysis.

Data Analysis.

The statistical treatment of the gathered data utilized descriptive, correlation, and predictive for analysis and interpretation. For the descriptive analysis, the respondents were characterized and examined using Measures of Central Tendencies, including frequency, percent, and cumulative percent distributions, as well as grand and component means. In the correlation analysis, the Product-Moment Correlation Coefficient, also known as Pearson r-test statistics, was employed. Developed by Karl Pearson around 1900, this statistical tool assesses and quantifies the strength of linear relationships between two sets of interval-scaled and/or ratio-scaled variables (Lind, 2000). To ascertain the predictive accuracy of r, the Coefficient of Determination (r²) was utilized. This measure reinforces and offers a more precise interpretation of the correlation findings (Dunn, 2001). Predictive accuracy refers to the percentage contribution of one variable when correlated with another.

Ethical Consideration

The following principles were strictly observed during the conduct of the study.

Protection of Human Rights.

Ethical standards were followed for the protection of the respondents' interests: the ideals of respect for people, charity, and justice. The first principle is *respect* for persons. In this concept, the respondents undertake the exercise of autonomy. This applies to respondents' right to decide what activities they take or will not take. Participants are made to understand what they are being asked to do in the study which is simply to answer a survey questionnaire on their knowledge, attitude, and practices on antimicrobial stewardship and make a rational decision on the impact of participating in the research on them and make a choice to participate freely or willingly free of coercion, restriction, or undue influence. As evidence, a consent form was used to

signify their willingness to participate. The principle adhered also was beneficence, related to the researcher's duty to maximize the study's benefits and minimize the risks. The principle also requires that the researcher would not cause any harm to the respondents, and this was achieved in the research by not implementing any treatments, procedures, or alternatives.

The third principle was *justice* which explained that the respondents should be selected equitably. The criteria for inclusion and exclusion were used when recruiting the participants. Further, the study did not include any vulnerable subjects. Respondents were subjected to the same data collection process in which to answer a questionnaire through face-to-face intercept. The study would make the bona fide respondents one of the beneficiaries of this research.

The principle of *transparency* was observed as the researcher intended to provide a copy of the study and its output to the MSUS Marawi campus' Office of the President and Office of the Vice President for Research. The researcher also hoped to publish and present the study in the international journal publication and international research congress.

Results and Discussions

Table 1. Depression, Anxiety, and Stress amidst COVID-19 Pandemic

(-) Emotional State		Depression			Anxiety			Stress			Average
Interval	Label	(f)	%	Cum%	(f)	%	Cum%	(f)	%	Cum%	%
≥ 3.22	Very High	1	1.0	1.0	1	1.0	1.0	1	1.0	1.0	
2.41-3.21	High	6	6.2	7.2	5	5.2	6.2	4	4.1	5.1	6.2
1.60-2.40	Fair	6	6.2	92.8	4	4.1	93.8	12	12.4	94.9	93.8
0.79-1.59	Low	27	27.8	86.6	39	40.2	89.7	36	37.1	82.5	
≤ 0.78	Very Low	57	58.8	58.8	48	49.5	49.5	44	45.4	45.4	
Component Mean		0.63 Very Low			0.68 Very Low			0.78 Very Low			
Grand Mean		0.70 Very Low									

N=97

As reflected in Table 1 above, the mean analyses reveal that the participants perceived an overall very low negative emotional state, as indicated by the grand mean of 0.70, which is rated as very low. This result is supported by the specific component analyses, showing very low levels of depression (mean = 0.86), anxiety (mean = 0.93), and stress (mean = 0.97). These findings suggest that despite the challenges posed by the COVID-19 pandemic, teachers generally maintained emotional stability. It's encouraging that the pandemic's impacts on teachers' emotions seem to be very mild.

However, upon cumulative percent investigations, certain variabilities emerged. A small portion of respondents experienced high-to-very high levels of depression (7.2%), anxiety (6.2%), and stress (5.1%) – averaging at 6.2%.

Conversely, a significant majority reported very low-to-fair degrees of depression (92.8%), anxiety (93.8%), and stress (94.9%) – averaging at 93.8%. This suggests that while most teachers are managing well, there remains a subset who are significantly grappling with their emotional health amid the pandemic.

Table 2. Respondents' State of Overall Well-being amidst COVID-19

Well-Being State				
Interval	Magnitude Label	Frequency (f)	Percent (%)	Cumulative (%)
≤ 0.78	Very Poor	2	2.1	2.1
0.79-1.59	Poor	23	23.7	25.8
1.60-2.40	Fair	30	30.9	74.2
2.41-3.21	Good	24	24.7	43.3
≥ 3.22	Very Good	18	18.6	18.6
Mean			2.34 Fair	

N=97

Table 2 above, reveals that respondents generally reported a fair overall state of well-being (mean 2.34) during the COVID-19 pandemic. However, cumulative analyses revealed that 25.8% experienced poor-to-very-poor states of overall well-being, while 74.2% were within the fair-to-very-good range. Although the majority displayed a positive overall well-being status, a noteworthy percentage indicated a significant decline in their well-being state. This indicates that while many teachers have managed to uphold a healthy well-being outlook, there remains a considerable portion who are significantly struggling.

For correlation (r), see Table 3, a negative linear relationship exists when depression (r= -.404**), anxiety (r= -.242*), and stress (r= -.397**) were associated with overall well-being state. In simpler terms, when levels of depression, anxiety, and stress go up, so does the likelihood of experiencing negative overall well-being impacts. Confirming depression, anxiety, and stress, or overall negative emotional states are significant negative linear predictors of overall well-being state. This highlights the interconnectedness of emotional health and overall well-being.

Table 3. Correlation Between Independent and Dependent Variables

Dependent Variables	Well-Being State				
	Independent Variables	(p)	(r)	(r ²) %	Decision
Depression		.000	-.404**	16.32	Reject H ₀
Anxiety		.017	-.242*	5.86	Reject H ₀
Stress		.000	-.397**	15.76	Reject H ₀

N=97; ** Correlation is significant at .01; * Correlation is significant at .05 level (2-tailed)

Furthermore, coefficient of determination (r²) reveals the extent to which each negative emotional state component: depression levels predict 16.32%, anxiety 5.86%, and stress 15.76% of the overall well-being. Interestingly, stress emerges as the strongest predictor, followed by anxiety and then depression. This suggests that while depression and anxiety

are significant, stress plays a larger role in influencing overall well-being during times of crisis like the COVID-19 pandemic.

Moreover, the coefficient of determination (r²) indicates the degree to which each component of negative emotional states – depression levels predict 16.32%, anxiety 5.86%, and stress 15.76% of overall well-being. Interestingly, stress emerges as the most potent predictor, followed by anxiety and then depression. This implies that while depression and anxiety hold significance, stress exerts a greater influence on overall well-being during crises such as the COVID-19 pandemic.

Conclusion

In conclusion, many Marawi Filipino teachers perceive very low levels of depression, anxiety, stress, and negative emotional state amidst the COVID-19 pandemic, and this suggests a certain level of resilience and coping strategies among the respondents. While most Marawi Filipino teachers have managed to maintain relatively stable mental health during the pandemic, there's still a subset who are experiencing significant distress. This underscores the importance of providing targeted support and resources to those who are struggling the most. Additionally, the analysis confirms that depression, anxiety, and stress are significant predictors of negative psychological health, with stress being the highest predictor, followed by anxiety and then depression. This underscores the importance of addressing stressors and implementing stress management techniques in mental health interventions.

Recommendation

Based on the study, few respondents demonstrated elevated levels of depression, anxiety, and stress symptoms, alongside a few experiencing compromised psychological health, the researcher suggests the following recommendations:

- MSU administrators should issue directives to the heads of external units to devise coping activity programs, as well as develop and implement support programs and interventions aimed at addressing the detrimental effects of depression, anxiety, and stress, along with negative psychological states among teachers amidst the ongoing Covid-19 pandemic. The aim is to mitigate these issues in the long term. MSU teachers should be granted sufficient time and resources dedicated to enhancing their emotional and psychological well-being. Additionally, efforts should be made to foster a supportive and resilient environment for Marawi Filipino teachers amid the challenges posed by the COVID-19 pandemic, ensuring they can continue to thrive in their roles as educators. This recommendation

is based on the understanding that the overall well-being of teachers directly impacts the academic performance of their students. Furthermore, it is recommended that further research utilizing advanced quantitative and qualitative methodologies be conducted to deepen our understanding of the impact of COVID-19 on emotional and psychological well-being. Such endeavors will enhance the robustness and depth of our comprehension of these phenomena.

Acknowledgment

The authors express their gratitude to all of the instructors who participated in this study, the dean of CSPEAR, Dr. Adlawan A. Hendely, the principal of MSU UTC, and Dr. Stephen A. Fadare, who acted as our internal peer reviewer. We are grateful to the editor and the peer reviewers who provided anonymous reviews of the work. Praise be to the All-Powerful God, Amen.

Conflict of interest

No conflict of interest to declare

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