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DETERMINANTS OF STRESS AMONG GRADUATE STUDENTS FROM UNIVERSITY OF GHANA SCHOOL OF PUBLIC HEALTH AMID COVID-19

BY

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DECLARATION

This work is the result of my thorough research, and it has not been submitted for any academic award at this or any other university. All of the work's references have been properly acknowledged.

Any inadequacies in my performance are entirely my fault.

16/03/2022

…… ……

Agartha Obeng Date

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CERTIFICATION

I hereby certify that this long essay was supervised per procedures laid down by the University.

16/03/2022

…… ……

Dr. Albert Atabila Date

(Supervisor)

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Glory and honor be to the Almighty for His favour and unending grace.

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DEDICATION

This thesis is dedicated to the Almighty God, creator of the universe for the strength, favour and protection throughout this work.

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ABSTRACT

Background: Before COVID-19, stress among university students was common due to academic work, social life, deadlines, exams, financial burdens, and separation anxiety. The pandemic has caused fear, anxiety, and uncertainty, forcing educational institutions to transition from face-to-face to online learning to minimise virus spread.

Aim: The study aimed to determine whether fear of COVID-19 virus contamination, online learning, and other factors contributed to the level of stress among graduate students and to examine how students were coping with the stressors.

Methodology: A descriptive cross-sectional design was adopted for this study. This study involved 77 graduate students from the School of Public Health, University of Ghana, selected through stratified and simple random sampling. Data was collected using Google Forms questionnaires and the COVID-19 Student Stress Questionnaire (CSSQ) to determine stress levels. A p-value < 0.005 was considered significant.

Results: The graduate students scored average on the CSSQ. It found that fear of contracting COVID-19 and online learning failed to predict a statistically significant association with stress levels. The main coping mechanisms were strict personal protective measures and reading about COVID-19, its prevention, and its transmission mechanisms.

Conclusions: Fear of contracting COVID-19, online learning, and other factors influencing stress failed to predict the level of stress of graduate students amid COVID-19. An overall average stress score was obtained, and students adopted multiple coping strategies to cope with the pandemic.

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AIDS	Acquired Immune Deficiency Syndrome
APA	American Psychological Association
CGS	Council for Graduate Schools
CSSQ	COVID-19 Student Stress Questionnaire
GHS	Ghana Health Service
H1N1	Hemagglutinin type1 and Neuraminidin type1
IPC	Infection Prevention and Control
SARS	Severe Acute Respiratory Syndrome
UNESCO	United Nations Educational Scientific and Cultural Organization
UNICEF	United Nations International Children's Education Fund
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Stress is a "state of physiological and physical tension produced, according to the transactional model, when there is a mismatch between the perceived demands of a situation (the stressor) and the individual's perceived ability to cope (Brody & Dwyer, 2002)". The prevalence of stress among students has been established (Dealy et al., 2014). Student stressors include, among others, balancing academic and social responsibilities, meeting deadlines, exams, financial burdens, and separation anxiety (from family). The outbreak of COVID-19, which originated in China and rapidly spread to the rest of the world, resulted in a global pandemic affecting 123,150,874 million people and causing 4,116,946 deaths as of 20th July, 2021 (WHO, 2021). It is hypothesised that the COVID-19 pandemic will have a significant impact on psychological health and education, as previous global health emergencies have been associated with high levels of stress, depression, and anxiety (DiGiovanni et al., 2004; Sahu, 2020).

On 12th March 2020, the first two cases of COVID-19 were recorded in Ghana. These cases were brought into the country from Norway and Turkey. As of 15th March 2020, there were 6 confirmed cases in Ghana (MOH, 2020). To prevent the transmission of the virus, the Government of Ghana ordered the closure of all institutions (Nyabor, 2020). All academic activities came to a halt; students faced uncertainty; those who were already in school did not know when they would return to school to write their exams and advance to the next level; and those who were waiting to graduate that year also experienced anxiety. The government imposed many restrictions to prevent the spread of the infection

(myjoyonline.com), which resulted in isolation and economic hardships that triggered a variety of psychological problems, including panic, anxiety, and depression, among the citizens. Some individuals lost their jobs and sources of income (Qui & Shen, 2020), and the general population experienced an increase in anxiety. As of June 2020, there were 17,741 cases and 112 deaths in Ghana. The restrictions were loosened in June 2020, and final-year university students were permitted to return to school while adhering to COVID-19 protocols to complete lectures and write examinations (GHS, 2020). Universities have suspended both fresh undergraduate and graduate admissions for the 2020/2021 academic year until the government permits students to return to school in February 2021, in strict compliance with COVID-19 protocols. Globally, online education has become a necessity for educational institutions (Al Kumaim et al., 2021; Adnan & Anwar, 2020; Mukhtar et al., 2020; Sahu et al., 2020; Ebohun et al., 2020; Ebohun et al., 2020). To restore some semblance of normalcy amidst the crises, the Government of Ghana issued directives to all educational institutions to implement distance learning programmes (GHS, 2020) so that social distance could be practised.

Institutions of higher education, such as the University of Ghana, were required to make rapid adjustments in the face of challenges and obstacles and migrate all course materials and content online (University of Ghana, 2020). Insufficient access to technological devices, poor internet connectivity, and the cost of internet data rendered students unprepared for this development. In addition, students missed out on real-time interaction with instructors and peers. Furthermore, traditional classroom socialisation, in which students communicate ideas, knowledge, and information, is no longer practicable (Brit, 2006; Adnan & Anwar, 2020).

Fear and panic have been associated with the pandemic since its 2019 onset, which is not unusual given previous global pandemics such as Severe Acute Respiratory Syndrome (SARS) in 2003, H1N1 Swine Flu in 2009, and Ebola in 2015 (Blakey et al., 2015; Pettinger, 2020; Deema, 2020). The spread of any infectious disease is associated with fear and panic, as demonstrated by the results of a study among students in Saudi Arabia, which reported that the majority of the students had fear and anxiety related to COVID-19 (Hossein et al., 2020; Ahorsu et al., 2020; Pakpour et al., 2020). Graduate students experienced pandemic fear to a greater extent than usual because they are already confronted with unique circumstances, such as work-life balance stress, family roles and responsibilities, and the financial burden of funding their education. The majority of graduate students are mature married and employed adults who must balance their professional and academic lives (Mier, 2020).

COVID-19 has added to an already extant source of anxiety among graduate students (Fawaz & Samaha, 2020). Graduate students may experience an increase in stress and anxiety as a result of the addition of online learning, which can be exacerbated by the presence of a digital screen, the cost of internet access and slow connectivity, and decreased physical activity.

Sylye (1976) suggests that one method of assessing stress is to conduct a physiological evaluation and examine the relationship between stress and illness. Lazarous and Folkman (1954) also recommended a psychological approach, in which stress is viewed as a connection between an individual and his or her environment. This relationship should be viewed as requiring significantly more effort than the individual's available resources or capacity and, as a result, being detrimental to one's health or welfare. In essence, stress

occurs when a person perceives a situation or task to be beyond his or her capabilities or available resources.

Stress can induce both a negative (distress) and a positive (eustress) response in individuals. Negative stress can contribute to academic burnout and exhaustion among students (Allen & Bavall, 2021). Multiple factors exacerbate student distress (Charles et al., 2020). According to mental health professionals, graduate students' negative stress levels have reached a crisis level.

Positive stress is the recognition of a distressing event as an opportunity that will contribute to a healthy outcome. Students can be motivated to accomplish greater heights and realise their complete potential when they experience positive stress. Positive stress motivates students to strive for academic excellence and learn how to surmount and effectively manage stressful situations. When tension is effectively managed, student attrition rates are reduced, and learning outcomes are enhanced. Given the impact of the pandemic and the fact that graduate students are six times more likely to develop anxiety and depression (Evans et al., 2018), academic institutions need to support and promote research into the mental health of graduate students.

1.2 Problem Statement

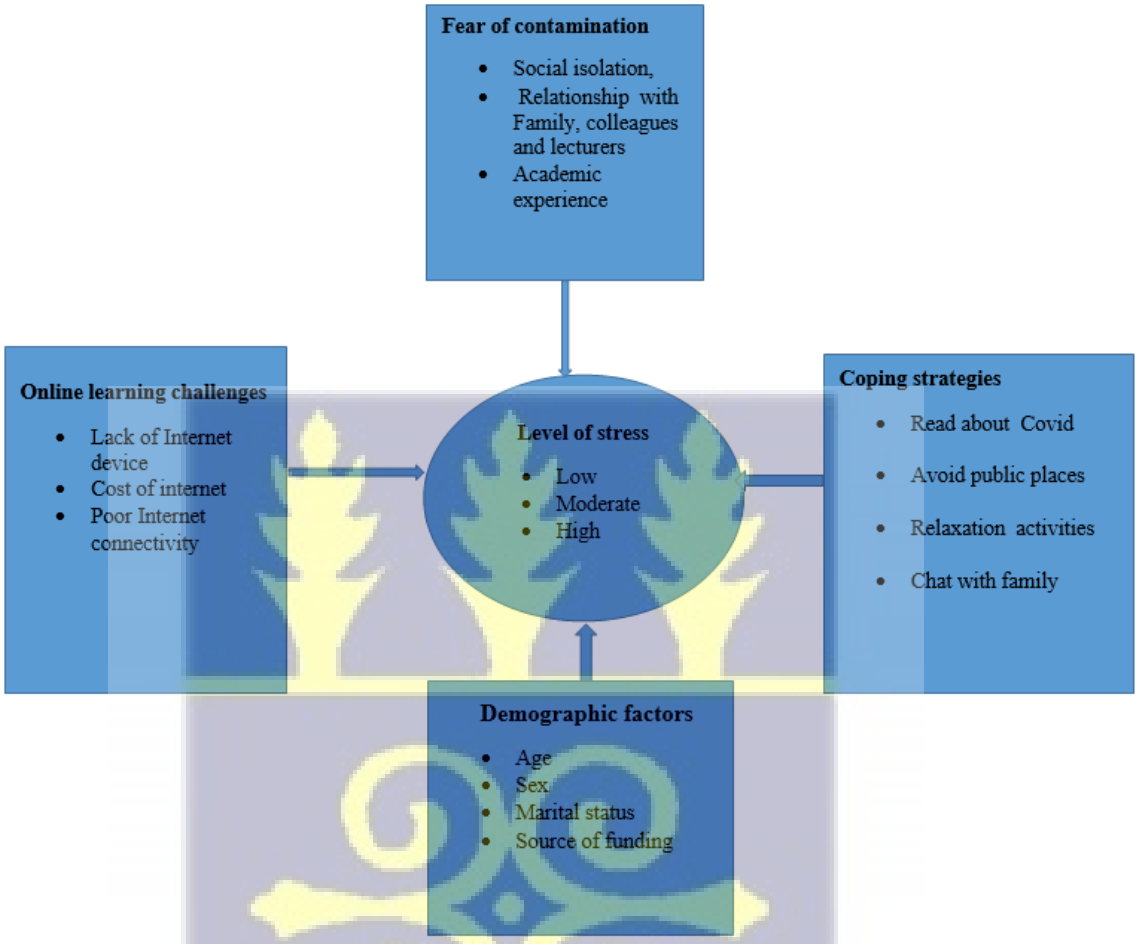
Students universally experience stress. Graduate students are at a greater risk of developing mental illness than the general population due to social isolation, the nature of their work, and feelings of inadequacy, as well as limited job prospects or career advancement opportunities after graduation due to the impact of COVID-19. 56% of respondents to a survey in the United States reported that COVID-19 has negatively affected them, resulting in stress and anxiety (Braizer, 2020). Due to the COVID-19 outbreak, 138 (71%) of

participants reported stress and increased anxiety, and 167 (86%) reported fear for themselves and others if they contracted COVID-19 (Son et al., 2020). Fear for one's health and that of one's loved ones, difficulty concentrating, and disruptions in sleeping patterns are reported as stress symptoms among students. These symptoms contribute to an increase in stress, anxiety, and depressive thoughts. Stress has been linked to ailments such as hypertension, cardiovascular disease, peptic ulcers, and even cancer. Many graduate students are experiencing the psychological and physical effects of stress as a result of preexisting stress causes. COVID-19 has propelled students into new dimensions of potentially stressful factors such as contamination stress and online learning.

Before the advent of the COVID-19 pandemic, graduate students in Ghana had been the subject of numerous studies on stress; however, no research had been conducted on the causes of stress among graduate students during the pandemic.

Beyond being deadly, the COVID-19 pandemic also poses severe psychological risks, including unbearable psychological pressure, fear, anxiety, depression, suicide attempts, and pain to all and sundry (Bender, 2020). In Ghana, for instance, schools were closed down due to the upsurge of COVID-19 in March 2020 (Owusu-Fordjour et al., 2020). Although frantic efforts were made to migrate learning online, such efforts were hampered by intermittent power supply fluctuations and poor internet connectivity. Besides the structural challenges that COVID-19 presented to educational facilities, the pandemic also unleashed a horde of psychological distress on both lecturers and students. For instance, Asamoah et al. (2023) found that the upsurge of COVID-19 has triggered psychological, economic, and educational conundrums that have to be addressed. Amoako et al. (2022) found that the COVID-19 pandemic negatively affected health behaviours for many

students, including dietary intake, sleep quality and duration, alcohol consumption, exercise frequency, and exercise intensity. A majority of the students had increased financial stress during the pandemic. Despite these documented effects of stress, COVID-19, and their problems and consequences, research remains narrow in academia and the Ghanaian educational sector on the fear of contracting COVID-19, stress levels, online learning, COVID-19-related stress factors, and coping mechanisms of graduate students. Hence, there is a need to assess whether the fear of contracting COVID-19 and online learning contributes to the stress levels of graduate students. It also assessed the potential factors associated with COVID-19-related stress and how graduate students coped with these stressors.



Source: Author's construct (2022)

Figure 1.1: Conceptual framework on stress and coping strategies

The conceptual framework is a graphical representation of the relationship between the dependent variable (stress levels) and independent variables (demographic factors, fear of contamination, online learning, factors associated with stress and coping mechanisms) used for the study. It shows that changes in the independent variables have an influence on stress levels. It also shows that various coping mechanisms are used to manage stress. The diagram shows that stress levels are measured as low, moderate and high.

1.3 Narrative

The conceptual framework has been developed based on fear of contagion existing among students directed either to self or to family members contracting COVID-19.

A study conducted among Chinese students found fear of contagion to correlate with stress, and that fear was significantly related to stress (Yang et al., 2021). COVID-19 has had a catastrophic impact on the world, causing the fatalities of more than 6 million people worldwide (Wikipedia, 2021) and counting, and we have no idea when it will be eradicated as we work out how to combat it. No one has complete control over unidentified emergent health conditions that pose a threat to public health (Yang et al., 2021). Therefore, fear of contagion is justified, given that it has thrust humanity into a period of unprecedented helplessness and loss of control. Everyone faces an imminent threat from the pandemic. Students fear for themselves and their families, so limiting interaction with others, prevents the spread of the pandemic, which can cause graduate students' stress. Transmission has occurred primarily through human-to-human contact, with acquired cases in hospitals and the community exhibiting either no symptoms or mild symptoms. Fear of contamination stems from the possibility of contracting the infection, being hospitalised with it, or passing away from it. The fear may be for oneself or one's loved ones.

Online learning is the adoption of web-based systems software to direct, design, and deliver the learning content, fostering two-way communication between students and faculty (Stern, n.d.). Adapting to fully functional online learning in response to the pandemic has not been without challenges and obstacles across educational institutions (Al Hassan et al., 2020; Mohammad & Anwar, 2020), such as slow internet speed, cost of internet data, and lack of internet-enabled devices, especially in underdeveloped countries, as supported by

research in Pakistan, which found students cited online learning as resource-intensive since they had to invest in laptops. This created an extra burden for them and plunged them into stress.

According to a 2020 UNESCO report, approximately 3.6 billion people still lack internet access, and at least 463 million, or nearly one-third of the world's student population, cannot access remote or online learning, mainly due to a lack of online learning policies or the equipment required to connect from home.

There are age-related differences in how individuals experience and respond to stress and how stress affects them. This disparity is due to the challenges presented by various life stages. Younger adults are stressed about school and school-related issues, whereas middle-aged adults are stressed about work and elderly adults are stressed about their health. (2018, Chen et al.).

The American Psychological Association (APA] (2011) stated that women scored 5.4 on a stress scale from 1 to 10, where 1 is little stress and 10 is extreme stress. Men scored 4.8. This indicates that women reported experiencing more stress than men. Men and women manage stress differently. Men are less concerned with stress management, while women may believe they are not doing enough. 68% of women said stress management is essential, compared to 52% of men. As a result of their hormonal systems, which cause them to respond to stress differently than men, women tend to experience more stress than men and therefore act more emotionally. Similarly, women perform a variety of roles in their daily lives (Espada, 2017). According to Verma et al. (2011), sex hormones may be to blame for the stress differences between men and women, as these differences are present during the reproductive stage and progressively subside after menopause.

In a survey conducted among medical students to investigate stress, coping, and gender differences, female students concluded that females experience significantly more stress from academic pressure than their male counterparts, but that there was no gender difference in overall stress. Males concentrated heavily on humour (action-oriented) and self-blame (maladaptive). As evidenced by an increase in problem-focused strategies and emotional support (emotion-focused) (Chen et al., 2018), females sought support.

According to the CSSQ, stress levels have been categorised as mild stress, moderate stress, and high stress.

1.4 Justification of the study

Research has demonstrated that student stress can contribute to a decline in academic performance, decreased motivation, an increase in dropout rates, substance abuse, sleep disturbances, melancholy, and, in some cases, suicide. According to Pascoe et al. (2019), the long-term effects of student stress on the economy are estimated to cost the United States $300 billion annually and negatively impact the sustainability of human resources.

Amid the COVID-19 pandemic, there has not been a significant amount of research on the causes of stress among graduate students in Ghana. Therefore, it is necessary to determine whether COVID-19 has introduced new sources of stress among graduate students and to assess how these students are coping.

This research will serve as a reference and contribute to the existing body of knowledge regarding stress, COVID-19, its associated factors, and coping mechanisms. The study will provide mental health professionals, social workers, etc. with information to assist them in

managing their patients' and clients' tension and promoting their mental and physical health.

The study will aid practitioners at the University of Ghana's School of Public Health in planning strategies and programmes to educate and integrate stress management into the curriculum and student support activities. The study will aid practitioners at the University's guidance and counselling department in providing support services to students and faculty.

The study will help policymakers (Ministry of Health (MoH), Ministry of Education (MoE), Ghana Health Services (GHS), and school administrators, among others) formulate and implement stress-related policies and programmes to address stress and COVID-19-related stress issues in the country. In addition, it will guide the formulation of proactive policies to combat the tension caused by future public health issues.

1.5 Research Questions

1. Does fear of contracting COVID-19 contribute to stress levels of graduate students?
2. Has online learning contributed to stress levels of graduate students?
3. What factors are associated with stress?
4. What coping strategies are employed by graduate students to cope with these stressors?

1.6 Objectives

1.6.1 General Objective

To investigate COVID-19-related stress among graduate students at the University of Ghana School of Public Health and to assess coping mechanisms adopted to cope with these stressors.

1.6.2 Specific Objectives

1. To determine if the fear of contracting COVID-19 contributed to stress levels of graduate students.
2. To determine if online learning affected stress levels of graduate students.
3. To determine the potential factors associated with COVID-19-related stress.
4. To examine how graduate students coped with these stressors.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter provides a literature review pertinent to the study. It includes a collective summary of graduate student stress, additional research on graduate student stress, fear of contamination with COVID-19 as a precursor to student stress, online learning as a contributing factor to student stress, and graduate student coping strategies.

2.1 Stress among graduate students

Stress among graduate students is a consequence of pressure from academics, the most prevalent source of stress for all categories of students. Academic stress is unavoidable for all students during the learning process and has a significant effect on every student during COVID-19. Graduate students face an increase in workload, a constrained time frame, family duties and responsibilities, tests and exams, and research (Brogard, 2019; Clabaugh, 2020; Scotts, 2020). Students may find it difficult to achieve a balance between their academic and professional lives and other responsibilities due to the extent of this requirement.

Examinations and grades can also cause stress for graduate students, the majority of whom are adult learners. They sense pressure from both faculty and personal expectations to achieve high grades (Tai, 2020). Obtaining high grades enables students to realise their personal goals while enhancing their employment prospects (Tai, 2020). Since earning a high grade is not only a measure of knowledge or intellect but also a component of knowledge, skill, and personality traits (Heckman, 2017). Personality is one of the most significant predictors of success. Regularly studying students experience anxiety during

examination periods. When students lack academic vitality (physical strength, survival resilience, and purposeful existence), i.e., the ability to adapt and respond to a variety of obstacles encountered during education (Folkman, 2015), they will be unable to adapt to the stress of studying (Yasmin et al., 2020). After academic stress, 63% of adults cited health-related issues as their primary source of stress (APA, 2020). Worrying about health issues can be a major stressor because it impacts their academic performance. Health concerns can be a significant source of stress (Albers & Pattuwage, 2017). During the academic year, illness can contribute to forgetting information imparted in class. Sicknesses such as the common cold, allergies, and bronchitis affected approximately 30% of study participants and caused them to lose time (Almojali et al., 2017).

In addition to housing, sustenance, textbooks, etc., the cost of education is costly. The cost of postgraduate education at a public university in the United States of America is approximately $30,000 per year (Peterson, 2018), in addition to other expenses. Depending on the institution and study programme, postgraduate education in Ghana will cost between GH20,000 and GH64,000 (Study Link 2005). Even if students receive financial aid, grants, or family assistance, they cannot avoid thinking about money. Financial responsibilities can be a source of stress.

The APA (2007) stated that women's stress levels are on the rise. According to a survey on the relationship between stress and gender, women are more likely than men to have experienced a great deal of stress in the past five years, and nearly half of all women reported experiencing increased stress over the past five years. Nonetheless, a longitudinal study of university students revealed that both males and females experienced moderate anxiety but that there were no significant gender differences in depression and stress levels.

A greater proportion of men reported varying degrees of depression in the same study (Gao & Liu, 2020). Men perceive a higher sense of self-efficacy than women, as women scored high in perceived stress and presented with anxiety and insomnia in addition to somatic disorders (Saleh et al., 2017).

According to Gafoor et al. (2019), marital status is a predictor of stress. A study of graduate dental students revealed that single students were anxious about their future careers in four key areas: academic responsibilities and confidence in their decision-making abilities regarding academic responsibilities. Married students had a high level of stress when competing for research experience and academic performance.

2.2 Impact of COVID-19 on stress

The COVID-19 pandemic has compelled several people across the globe to confront new emotional challenges, such as psychological stress. COVID-19 is a threat to both physical and emotional well-being because, diseases of public health concern have an emotional impact on stress levels and survival (Levkovich & Shinan-Altman, 2020). Psychological stress is produced by the fear that oneself or a loved one may become infected. Combined with reports of a shortage of essential medical supplies, feelings of fear and helplessness have the potential to cause stress (Ahorsu et al., 2020).

According to the findings of qualitative research on the Israeli population, media exposure led to high levels of stress because the majority of people watched the news nonstop from their homes and worried about the rise in the number of infections and deaths. Some information sources may be false or unreliable, with 35% of respondents experiencing stress and women reporting higher levels (Quin & Shen, 2020).

In a mixed study, Pferbaum and North (2020) identified the leading sources of stress among US citizens as contradictory information from government authorities, restrictions on freedom of movement due to public health measures, financial losses, poor prognoses, and imminent shortages of medical equipment and protection resources. Fear was also found to be positively associated with the pandemic, whether for oneself or one's family, as it was associated with stress, anxiety, and depression. All participants described having concerns about their health or for family, with 10 out of 1407 reporting that individuals close to them were under quarantine or tested positive for COVID-19. In addition, they reported increased levels of helplessness and stress (Levkovich & Shinan-Altman, 2020).

People are still having trouble adjusting to the new reality that the COVID-19 pandemic has spawned, as nearly eight out of ten American adults cite the coronavirus as a significant source of stress. Two-thirds of adults (67%) report experiencing stress as a result of the pandemic (APA, 2020).

2.3 Age and Stress levels

"Stress at any age is still stress (APA, 2012)." All age groups experience stress (APA, 2012). However, those between the ages of 18 and 33, 34 and 47, 48 and 66, and those 67 years and older are the most stressed. Stress in America Survey findings suggest that one's ability to deal with stress varies by age. Younger Americans report experiencing higher stress levels, but they are the least able to manage their stress successfully (APA, 2012).

Findings from a study carried out in Canada among 8267 participants reported that participants aged 60 years and older reported lower scores on the various rating scales they were measured on, which was found to be of interest given that the COVID-19 infection and death rate is outstandingly high among this age group when compared to the younger

age group (25 years and younger). According to researchers, this outcome is because, contrary to expectations, older age groups did not take more precautions when socially withdrawing and were not more stressed as a result of the high incidence of underlying conditions. Older age groups are more likely to have experienced major life events or past epidemics and pandemics and thus possess more abilities to withstand this COVID-19-related stress. The belief that the pandemic would have a significant negative impact on their academic, social, occupational, and economic prospects was a contributing factor to the younger age groups' high-stress levels. Nwachuku et al. (2020) and Varma et al. (2021) posit that older adults are susceptible to the virus, but the younger generation is at increased risk of poor mental health.

2.4 Marital Status and Stress

Married women go through an appreciable amount of stress in pursuit of education and academic activities, which contributes to poor academic performance, cynicism, and substance abuse during their academic lives. Combining studentship and marital roles is a source of stress as physical and psychological well-being are challenged (Akotor, 2018).

Married women will likely encounter role conflict as compared to their male counterparts. Women having multiple roles and other responsibilities, such as taking care of families, chasing their careers, and studying at the same time, have been described as having dual-career-plus responsibilities, which are stressful (Kwaakye-Nuako et al., 2009). The dual roles may elicit academic stress, fear, anger, and ineptitude, resulting in physical, mental, and psychological effects. It determined that while single students were worried about their future, married students were concerned with their academic and research performance. They also realised that marriage can act as a form of social support during times of stress

and subsequently help students overcome stress related to academic and personal life. Single females and separated or divorced males are more stressed as they do not have the same social support as their married colleagues (Ghafoor et al., 2020).

2.5 Source of Education Funding

According to Forbes (2020), the costs associated with attending college or university were already in motion in an unsympathetic or disadvantageous course for the average American household, but hurling the pandemic into the correlation is now posing a host of issues that could proliferate the trend. Four of the top five stressors among college students involved challenges associated with personal finances. Heckman et al. (2014), in their survey conducted across 19 colleges and universities across the state of Ohio with 4488 respondents, found that 71% of the respondents reported feelings of stress from personal finances.

Stress emanating from financial constraints may have negative outcomes, including anxiety, depression, poor academic performance, and difficulty completing or earning a degree. The pandemic has caused student financial support teams at the University of Reading to award levels of monetary support to students not seen since the 2008 Financial Crush (Darley, 2020), such that between March and July, $155,000 was awarded to students in need, which is more than what they normally would award in a whole year before the pandemic.

Compared to undergraduates, graduate students are at different stages of their lives, as they tend to be older, married, and with children, and as such, have diverse financial obligations. They have financial commitments towards their families and support themselves during their academic period. Sources of funding for graduate students include, but are not limited

to, grants, work-study (study leave), private and employer aid, institutional grants, and self-sponsored (CGS, 2018).

2.6 Fear of contamination

Fear of contamination during a pandemic in an individual refers to persistent and strong feelings of anxiety and apprehension resulting from a threat of potential contact or infection with COVID-19, either directly or indirectly (Knowels & Olatunji, 2021; Yang et al., 2021). To stop the spread of COVID-19, WHO has established protocols for the public to follow, such as frequent hand washing, social withdrawal, and face coverings. Fear of contamination causes both negative and positive health reactions (WHO, 2020). These protocols had to be adhered to. People are now washing their hands more frequently than ever, which is a good practice since hand washing is the single most effective way of breaking the infection transmission cycle (GHS, 2015). This positive health practice may also turn out to be detrimental to some personality types, which may lead to obsessive-compulsive behaviours and anxiety in the general population, consequently increasing stress levels. Public health emergencies (AIDS, Ebola, and SARS) triggered anxiety and fear, and likewise, COVID-19, leading to social mistrust among people and a change in human relationships (Bali et al., 2020; Di Crosta et al., 2020; Islam et al., 2020).

Fear of contamination made the Ebola pandemic's lack of timely control in 2014 even worse, exposing the world's inadequate healthcare systems and having catastrophic effects on the affected countries. Lack of information from reliable sources and false information about the pandemic in the media also contributed to the fear of contamination (Blakey et al., 2015).

The spread of any infectious disease is associated with anxiety, fear, psychological distress, and other symptoms of mental illness. A study conducted among university students in Saudi Arabia found the majority of the students exhibit fear and anxiety related to COVID-19 (Tahgir & Bozani, 2020). Other studies (Ahorsu et al., 2020) concluded that some fear of COVID-19 has also caused depression, anxiety, and stress (Wang et al., 2020; Laim et al., 2020). Islam et al. (2020) found more than 86% (259) out of 340 participants recounting they had COVID-19-related stress.

2.7 Online learning

Many educational institutions across the world were forced to temporarily close down schools after the announcement of the pandemic by the WHO in March 2020. Closures of schools in response to the COVID-19 pandemic have caused approximately 825 million students worldwide to be affected as of January 2021, and in an attempt to limit the spread of the novel coronavirus, 23 countries are currently implementing nationwide school closures and 40 are implementing localised closures (UNICEF, 2020). Therefore, educational institutions turned to electronic or online learning in the face of the pandemic to facilitate teaching and learning (Mheidly & Fares, 2020; Sahu, 2020) and how best to deliver educational content, actively engage students, and conduct assessments (Mukhtar et al., 2020). Online learning is a type of learning that takes place synchronously and/or asynchronously over the Internet through the use of digital devices (Stern, n.d.). Synchronous learning takes place in real-time, requiring login and class schedules. While asynchronous interaction does not require real-time logins, students can access content as and when it suits them and submit assignments to meet deadlines. Online learning has not been without challenges such as; the unavailability of personal internet-enabled digital

devices (laptops, computers, and phones), a lack of access to the internet (Alruwaiss et al., 2018), poor internet connectivity, and high internet data costs (Anwar & Kainat, 2020; Mukhtar et al., 2020). As confirmed by Begun et al. (2020), 70.4% of the respondents reported that they find it difficult to get access to the internet, and 73.9% brought to mind that they experience slow internet connectivity. This is an indication that internet connectivity becomes slow even if they get access to it. It was also reported that about 42.1% of respondents lacked proper internet devices to participate in the online classes, although 76% had access to internet connectivity. 47.5% were unable to bear the high cost of internet charges (Begun et al., 2020).

Ebohun et al. (2021), in a survey conducted among 703 students at five Nigerian universities, found that more than 50% of the respondents cited poor internet connectivity during virtual classes. This is comparable to a study in Bangladesh among students,1092, of higher institutions, where 50.5% encountered insufficient internet speed, and more so in another study at the University of Ghana by Darko-Adjei and Ankrah (2020) to find out students' perceptions and use of an online learning management system, which realised that 70% of the students found it impossible to use the system due to difficulties in getting access to the internet, while 73% cited experiencing slow internet connectivity. This means that they will not be able to participate fully in classes due to distractions (Ebohun et al., 2021), because one has to reconnect multiple times due to a break in connectivity, resulting in their inability to understand the course content being taught due to limited interaction, with the lecturer and other students (Ebohun et al., 2021; Adnan & Anwar, 2020), thus dissatisfaction among them, affecting their mental state. This has the potential to cause psychological problems such as anxiety among students since their academic performance

could be negatively affected in the long run, leading to stress. Some students have to share devices, such as laptops, with other relatives while at home due to the limited number of laptops, or other personal computer devices per household, and possibly the heavy demand placed on the computers and laptops while at home by other users when they have to work from home (Sahu, 2020).

Students are also not able to bear the high cost of the internet due to financial constraints placed on them from circumstances such as loss of job, reduced income, or other financial obligations towards family (Mheidy et al., 2020) and as a result of the impact and ramification of COVID-19, as concluded in a study among 1092 students from 15 public universities in Bangladesh (Begum et al., 2020). Darko-Adjei and Ankrah (2017) opined that graduate students are either employed or unemployed individuals and could be married or not married, and as such, are faced with diverse responsibilities and roles they play in addition to the high academic workload, which can take a toll on their psychological wellbeing. The burden of financially supporting themselves through school while at the same time caring for their family members may be solely resting on them, leading to stress for both married and unmarried students (Kwaah & Essilfie, 2017; Begum et al., 2020).

The pandemic has further led to an increase in on-screen time, that is, the number of hours people spend staring at the screens of phones, laptops, and computers, either to use media applications for work, study, or socialisation purposes, and this has the potential to cause an increase in anxiety and stress as reported by previous studies (Meihdy et al., 2020; Madhav et al., 2017). Stress from the use of smart devices is evidenced by psychological, physical, and musculoskeletal symptoms. Prolonged use of digital devices such as phones, tablets, and computers lead to digital eye strain, a developing public health issue that is

characterised by temporary discomfort (redness, irritation) in the eye after two or more hours of exposure to a digital device. Madhave et al. (2017) reported that students who spent more than four (4) hours per day watching television or using computers were at risk of developing anxiety, stress, and depression. Online learning and the potential for stress must be looked at, especially at this time when educational institutions have migrated to online learning and students are spending more hours on their screens to participate in classes.

2.8 Coping strategies

To master, reduce, or tolerate stress and stressors, one must implement coping mechanisms by making conscious efforts and employing energy to solve personal and interpersonal problems. This method of coping with stress may be adaptive (helpful or positive) or maladaptive (unhealthy, harmful, or negative) (Lazarus, 1993). Individual appraisal of coping expectations, the intensity of the stressor, and the context of coping all influence coping (Berardis et al., Glantsma).

Appraisal-focused coping, adaptive behavioural coping, emotional-focused coping, reactive and proactive coping, social coping and humour, and negative technique (maladaptive coping or no coping) are examples of coping strategies. Individual students respond to stress in a variety of ways, with varying degrees of success. Different coping mechanisms are used by students in response to distressing situations. Depending on the individual or the situation, these coping skills may be negative (maladaptive) or positive (healthy). In a study conducted among 323 distance education students at a Ghanaian university, it was found that students used a combination of coping strategies to deal with stress, including praying, meditating, and self-distracting activities such as viewing

television and listening to music. The emotional support of family and colleagues is also a useful strategy. In a survey of 305 graduates and professional students, 50% of respondents identified behavioural activation (physical exercise, outdoor activity, social activity) as the most effective strategy, while 3% identified behavioural distraction (TV, social media, food, music, alcohol) as the most effective strategy because it is easier to adopt but also maladaptive, and others identified social support (family, significant other, feelings) (Wasil et al., 2021). The study did suggest that behavioural activation, which is beneficial and has long-term effects, may be challenging to implement due to measures to stop the spread of the virus. A qualitative study involving four focused group discussions among medical students and interns in Saudi Arabia revealed that some students smoke to cope with stress, but this is ineffective because it does not relieve them of stress (Abuammoh et al., 2020) and is referred to as "avoidant coping strategies".

CHAPTER THREE

METHODS

3.1 Study Design

The study was a descriptive cross-sectional design to examine COVID-19-related stress among graduates from the School of Public Health at the University of Ghana.

The study was conducted from August 2021 to March 2022 at the University of Ghana. The University is situated about 13km north-east in the Greater Accra Region of Ghana. It is the premier university in Ghana and runs three campuses, namely the Legon campus, the Korle-Bu campus, and the Accra City campus.

3.2 Study Location

The School of Public Health of the University was established in 1994 in response to a growing demand for a cadre of public health practitioners who will provide leadership in the public health reforms in the country, primarily to train public health practitioners.

The School aims to produce graduates who will be equipped with knowledge, competencies, and skills to address public health challenges, undertake research in the discipline, promote healthy behaviour, and provide effective leadership.

3.3 Target population

The study population was all graduate students admitted to the School of Public Health (regular) for the 2020/2021 academic year.

3.3.1 Inclusion criteria

1. Graduate students enrolled in the regular programmes.
2. Graduate students offering Master of Science and Master of Public Health programmes.

3.3.2 Exclusion criteria

1. Graduate students not enrolled on the regular programme.
2. Graduate students not willing to participate in the study.

3.4 Sample calculation

The sample size was calculated using the model proposed by Glen et al. (1992).

$$n = \frac{P[1-P]}{\frac{A^2}{Z^2} + \frac{P[1-P]}{N}}$$

Where,

n = Sample size required

N = Total number of regular graduate students at the school of public health (121)

p = Estimated proportion of people with stress (0.5)

A = Precision desired around P to be estimated (0.05)

Z = Confidence level critical value (1.95 for 95%)

The minimum number of participants required for the study was therefore calculated to be 93.

3.5 Sampling Procedure

The selection of participants was done using an online system, where the students were contacted through their respective email addresses. With permission from the university authorities, a link was sent to the participant's email addresses and social media platforms. The participants were directed to answer questions in the questionnaire when the link was clicked.

An already existing stratified system from the school's data was used, where the student population was subdivided based on the enrolments in the different departments of the school, out of which a portion for each group was selected using a simple random technique.

3.6 Variables

3.6.1 Dependent variables

1. Stress

3.6.2 Independent variables

1. Demographic factors: Age, sex, marital status, educational funding
2. Fear of contamination
3. Online learning
4. Factors associated with stress
5. Coping mechanisms

3.7 Data collection instruments and tools

Demographic characteristics were collected using a structured questionnaire developed through Google Docs.

This questionnaire had four main items. The first section contains the demographic variables (age, sex, marital status, and educational funding).

The second section had an adopted COVID-19 Student Stress Questionnaire (CSSQ) component. It was used to assess the stress level of students. It comprised seven items on a 5-point Likert scale between the ranges of zero (0, not at all stressful) to four (4, extremely stressful). A Global Stress Score ranging from 0-28 is the threshold score of the CSSQ, where a score of 6 and below indicates low levels of perceived COVID-19-related Global Stress, a score of 7–15 indicates an average level of perceived COVID-19-related Global Stress and a score of 16 or more indicates high levels of stress among students.

The CSSQ has three factors:

1. Factor one is labelled fear of contagion. It comprised one item that assessed the perceived stress related to the risk of infection. Fear is in line with fear of others becoming ill and fear of being a source of contamination to others.
2. The second factor had few components that explored perceived stress related to social isolation due to containment measures.
3. The third factor consists of relationship and academic life and is composed of four items covering perceived stress related to relationship with relatives, relationship with colleagues, relationship with professors and academic studying.

The third section includes factors related to online learning that contribute to stress, such as the availability and sufficiency of internet devices, the cost of the internet, and internet connectivity. This was used to assess the availability and accessibility of logistics for online learning.

The fourth section consisted of coping strategies adopted by students to cope with COVID 19-related stress factors. This was adopted from the study of Baloran (2020).

3.8 Quality control

Biases were minimised through guaranteed data quality and accuracy, as sufficient systems were applied to ensure this. Through measures such as training of research assistants, pretesting, and editing of questionnaires before data entry, the computed questionnaire was edited and validated. The data was also cleaned before the analysis was done. To ensure protection and confidentiality, the completed questionnaire will be kept under lock and key.

Two researchers were engaged and trained to assist the researcher in the administration of the questionnaire, obtaining informed consent, sending follow-up emails and reminders, and handling sensitive information.

The questionnaire was pretested at the School of Nursing, and any discrepancies or lapses found were rectified before the start of the actual study.

The completed questionnaire was sorted, validated, and coded within 24 hours of data collection. Data was double-checked before entry into Microsoft Excel 2013 software. Stata Version 14 was used to analyse the data.

3.9 Data Analysis

The data was analysed using Stata version 14. Descriptive analysis of demographic data was carried out using frequencies, means, and standard deviations, which were then projected in the form of frequency distribution tables and bar graphs.

Stress levels were also analysed descriptively, with frequencies and percentages displayed in a bar chart. The chi-square statistics were used to test the association between the stress levels of students and their demographic data, using a p-value of ≤ 0.05 as the statistically significant value.

A Pearson Chi-square statistic was used to ascertain the relationship between factors contributing to stress and stress levels. Multiple linear regression and Pearson's moment correlation were used to ascertain the relationship between significant variables and levels of stress. Furthermore, coping strategies were analysed descriptively using frequencies and percentages and presented through frequency distribution tables.

3.10 Ethical considerations

This study was undertaken among graduate students from the University of Ghana School of Public Health. Ethical clearance was obtained from the Ethical and Protocol Review Committee of the College of Health Sciences, University of Ghana, and permission was also sought from the School of Public Health authorities.

The participants may not benefit directly from the study, but their responses will set the tone for discussion in the future during policy formulations at the university concerning the psychological burden major life events such as pandemics have on students and the

need to put adequate measures in place to minimise or mitigate them through support services.

The participants experienced no harm. The only inconvenience for the participants was the time it took to complete the questionnaire.

The design of the questionnaire was well structured to facilitate the discussion. The general nature of the questionnaire was made known to the respondents, and they were assured of protection as well as confidentiality of the data to be collected.

Respondents were informed they could opt out of the study at any point in time during their participation with no consequences.

A signed consent was obtained to indicate a willingness to participate.

Participants had the right to ask any questions they may have regarding the study. The privacy and anonymity of the information provided were treated with the utmost care.

The filled-out questionnaire was kept under lock and key to safeguard it from unauthorised access. The questionnaire will also be disposed of after 24 months of publication. The names of participants were not made known in any report from the study.

The researcher declared no conflicts of interest.

CHAPTER FOUR

RESULTS

4.1 Introduction

This segment presents the study results. It is in two parts. The first part is on the demographic characteristics of the participants. The second part presents the results of the study objectives.

4.2 Demographic characteristics

Table 4.1: Basic Information of Respondents

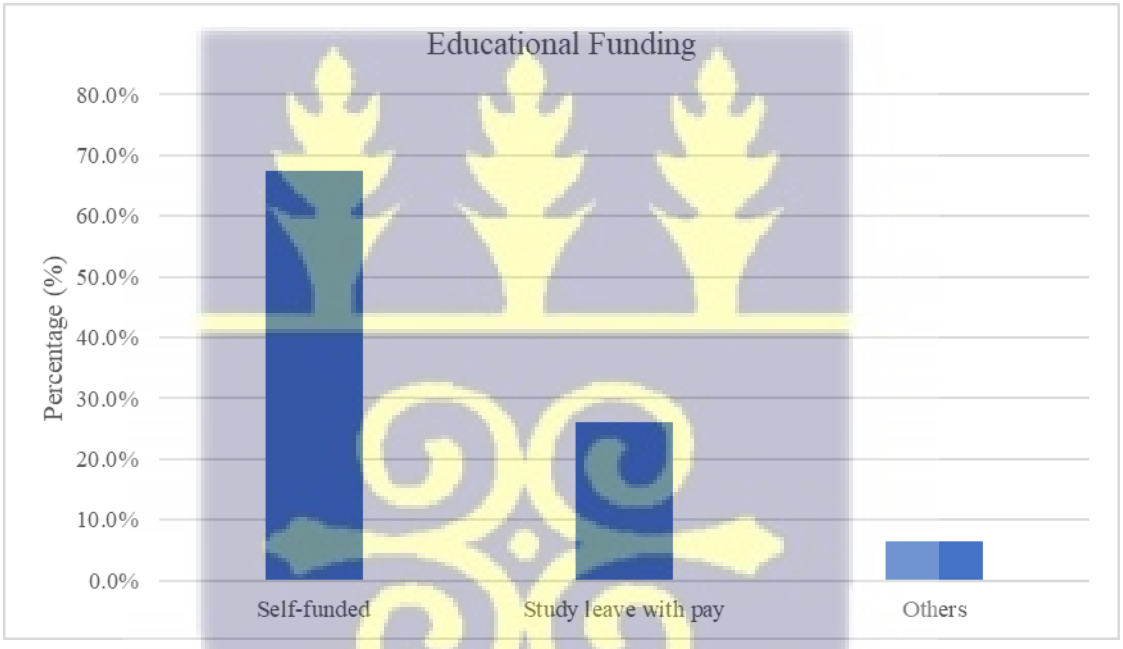
Characteristics	Category	Frequency (n)	Percent (%)
Questionnaire response	Responded	77	83
	Selected	93	100
Age	20 – 30 years	24	31.2
	31 – 40 years	35	45.5
	41 – 50 years	17	22.1
	51 – 60 years	1	1.2
Sex	Male	43	55.8
	Female	34	44.2
Marital Status	Married	46	59.7
	Single	31	40.3

Source: Field study (2023)

Shown in Table 4.1 are the demographic characteristics of the respondents. It showed that 77 students out of the 93 selected answered the questionnaire, representing an 83% response rate. It showed that the majority (45.5%) of the respondents were between the

ages of 31 and 40 years; 32.1% were between the ages of 20 and 31 years; 22.1% were between the ages of 41 and 50 years; and 1.2% were between the ages of 51 and 60 years. It showed that 55.8% were males, 44.2% were females, 59.7% were married, and 40.3% were single.

4.3 Educational funding type of graduate students

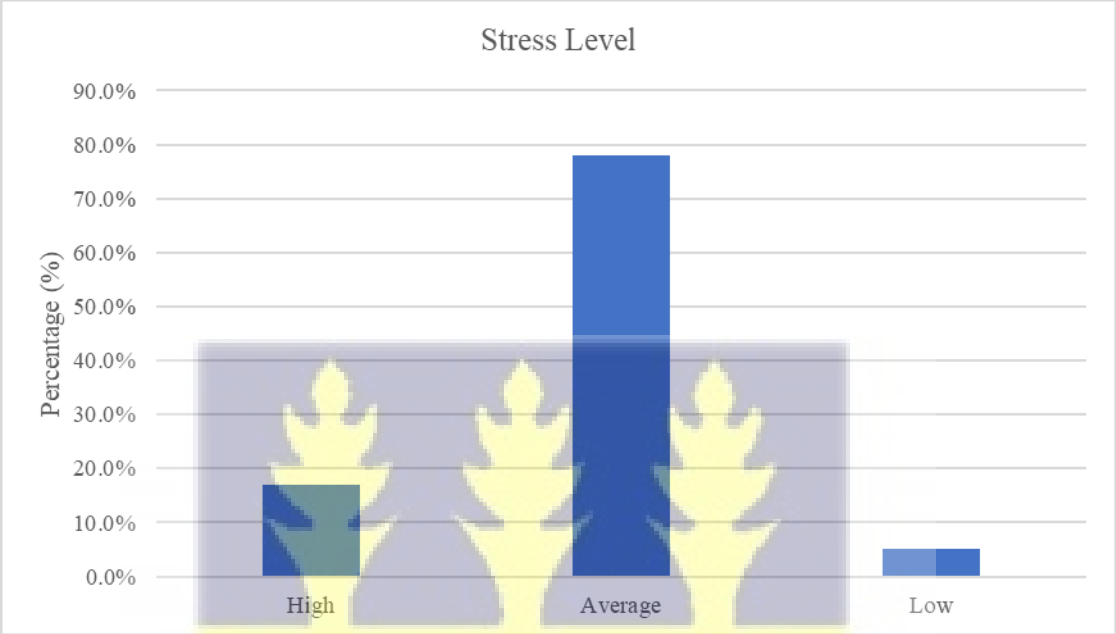


Source: Field Study (2022)

Figure 4.2: Educational funding type of graduate students

Figure 4.1 shows that the majority (67.5%) of respondents funded their education, 26% were on study leave with pay, and 6.50% cited other funding types for their education.

4.4 Overall stress levels of graduate students



Source: Field Study (2022)

Figure 4.3: Stress levels of graduate students

Figure 4.2 shows that based on the COVID-19 CSSQ Global Stress Score, the majority (77.9%) of the students were averagely stressed, which meant that they obtained between 7 and 15 points on the global stress score, while 17% scored between 16 and 28 points, denoting a high-stress level. However, 5.1% had a score lower than 7, denoting a low-stress score. This suggests that the majority of the respondents experienced average stress levels related to COVID-19 based on the CSSQ Global Stress Score.

4.5 Perceived Stress

Table 4.2: Perceived Stress of respondents

Variable	Not at all stressful	Somewhat stressful	Moderately stressful	Very stressful	Extremely stressful
Fear of contamination	0(0%)	17(22.1%)	29(37. 7%)	27(35.1%)	4(5.2%)
Social isolation	4(5.2%)	13(16.9%)	34(44.2%)	23(29.9%)	3(3.9%)
Relationship with family	21(27.3%)	27(35.1%)	21(27.3%)	41(53.3%)	12(15.6%)
Relationship with colleagues	1(1.30%)	12(15.6%)	51(66.2%)	9(11.7%)	4(5.9%)
Relationship with lecturers	3(3.90%)	8(10.39%)	42(54.6%)	20(25.97%)	4(5.9%)
Academic experience	1(1.30%)	2 (2.6%)	21(27.3%)	41(53.3%)	12(15.6%)

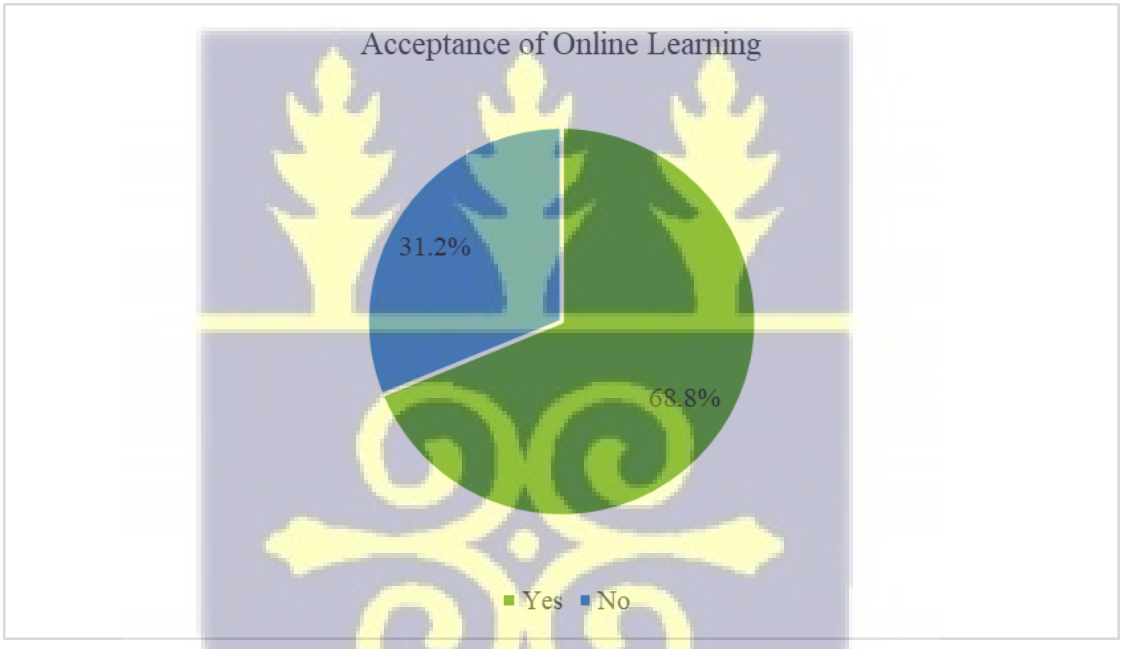
Source: Field Study (2022)

Shown in Table 4.2 is the perception of stress of participants related to COVID-19. On fear of contamination with COVID-19, 37.7% felt moderately stressed, 35.1% felt very stressed, 22.1% reported feeling somewhat stressed, and 5.2% reported feeling extremely stressed. The majority (44.2%) were moderately stressed about social isolation imposed on them due to COVID-19; 29% felt very stressed; 16.9% felt somewhat stressed; 5.2% felt not stressed at all; and 3.90% felt extremely stressed. The majority (53.3%) responded feeling very stressed about their relationship with family; 35.1% were somewhat stressed; 27.3% felt moderately stressed; and 27.3% felt not stressed at all.

The majority (66.2%) were moderately stressed about their relationship with their colleagues; 15.6% were somewhat stressed; 11.7% were very stressed; and 5.9% were extremely stressed. The majority (54.6%) felt moderately stressed about their relationship with university lecturers; 25.97% felt very stressed; 10.39% felt somewhat stressed; 5.9%

felt extremely stressed; and 3.90% were not stressed at all. Academic experience led to 53.3% of respondents feeling very stressed, 27.3% feeling moderately stressed, 15.6% feeling extremely stressed, 2.6% were somewhat stressed, and 1.6% were not stressed at all.

4.6 Acceptance of online learning

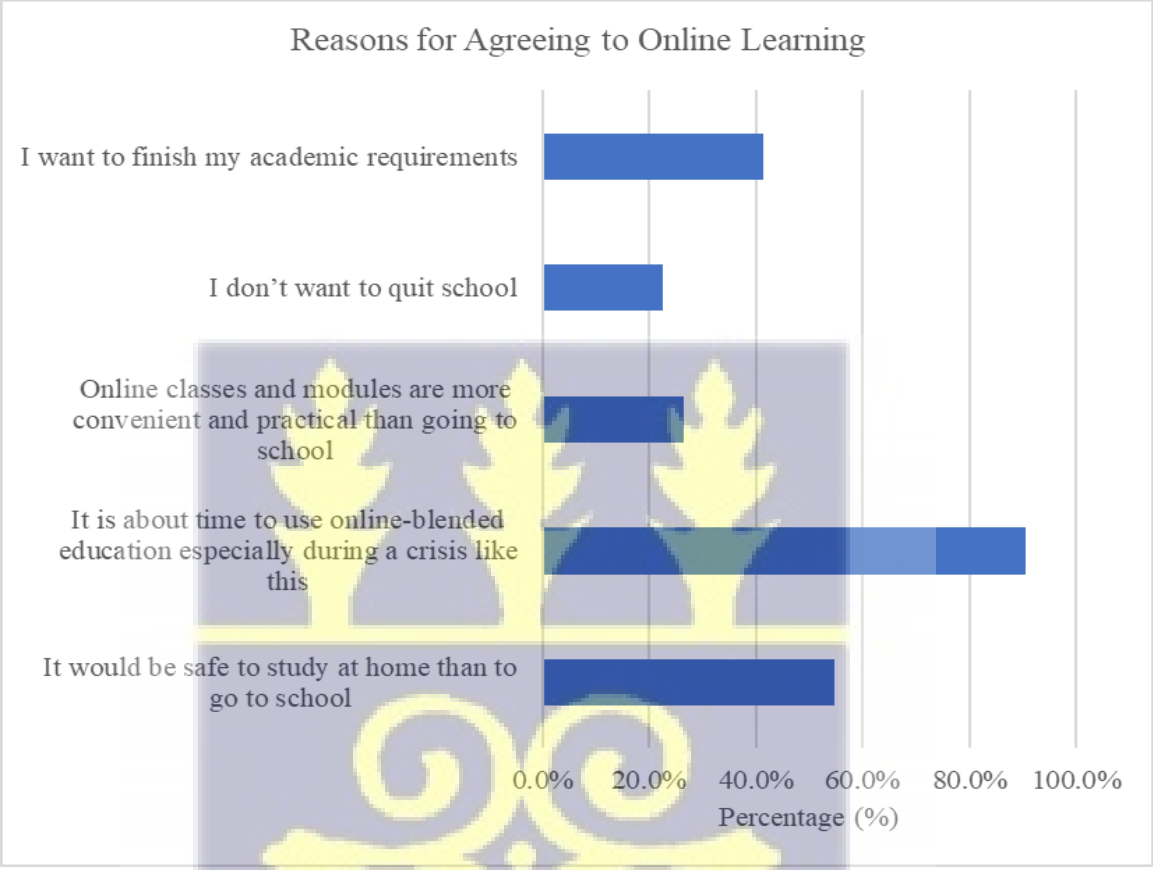


Source: Field Study (2022)

Figure 4.4: Acceptance of online learning

As shown in Figure 4.3, 68.8% of the respondents agreed with online learning, while 31.2% disagreed with online learning. Reasons for the disagreement were lack of personal interaction with colleagues and teachers (75%), boring online classes and modules (70.8%), lack of internet connection (58.3%), and financial constraints (16.6%).

4.7 Reasons for agreeing to conduct online learning



Source: Field Study (2022)

Figure 4.5: Reasons for agreeing to online learning

As depicted in Figure 4.4, reasons for agreeing to online learning were exegeses of the time and need to be proactive (90.5%), health and personal safety (54.7%), finishing academic requirements (41.5%), convenience (26.4%), and not wanting to quit school (22.6%).

4.8 Factors associated with stress

Table 4.3: Factors associated with stress

Variable	Mean	SD	Min	Max
Fear of contamination	2.870	0.964	1	4
Social isolation	3.246	1.387	1	5
Relationship with family	3.181	0.964	1	4
Relationship with colleagues	2.623	1.009	1	5
Relationship with lecturers	2.974	1.170	1	5
Academic experience	3.506	1.682	1	5
Online learning	1.688	0.466	1	2

Source: Field Study (2022)

As shown in Table 4.3 below, academic experience (mean = 3.506, SD = 1.682) had the highest mean score. This indicates that academic experience was the main cause of stress among graduate students, followed by social isolation (mean = 3.246, SD = 1.387), relationship with family (mean = 3.181, SD = 0.964), relationship with university lecturers (mean = 2.974, SD = 1.170), fear of contamination (mean = 2.870, SD = 0.964), relationship with university colleagues (mean = 2.623, SD = 1.009), and online learning (mean = 1.688, SD = 0.466).

Table 4.4: Relationship between factors associated with stress and level of stress

Variable	R	p-value
Academic experience	0.214	0.06
Social isolation	-0.202	0.08
Relationship with family	0.018	0.88

Source: Field Study (2022)

Table 4.4 shows that academic experience (r = 0.214, n = 77, p = 0.06) had a weak but positive correlation with stress levels. This means that an increase in academic experience stress will increase overall stress levels. Social isolation (r = - 0.202, n = 77, p = 0.08) showed a weak negative correlation with stress levels. This means that an increase in social isolation will decrease stress levels. Relationship with family (r = 0.018, n = 77, p = 0.875) showed no correlation with stress level. This meant that changes in relationship with family would not affect stress levels.

4.9 Association between determinants and level of stress

The objective was to ascertain the relationship between demographic variables (age, sex, marital status, education, and funding type), fear of contamination, online learning, and stress levels. This objective was achieved using a Pearson Chi statistic, and the results are shown in Tables 4.5 to 4.10.

4.9.1 Association between age and stress levels

Table 4.5: Association between age and stress levels

Age (years)	High	Average	Low	Chi-square	p-value
20 – 30	6	18	0	10.458	0.107
31 – 40	4	28	3		
41 – 50	1	15	1		
51 – 60	1	0	0		

Source: Field Study (2022)

Table 4.5 depicts the Pearson Chi statistic test, which showed no statistically significant relationship between age and stress level of graduate students, given that the Chi-square (10.458) has a p-value (0.107) greater than the significance level of 0.05. This meant that the age of graduate students did not have any bearing on their stress levels.

4.9.2 Association between sex and level of stress

Table 4.6: Association between sex and level of stress

Sex	High	Average	Low	Chi-square	p-value
Male	26	5	3	1.6315	0.442
Female	35	7	1		

Source: Field Study (2022)

As shown in Table 4.6, the test revealed no statistically significant relationship between sex and stress levels of graduate students, given that the Chi-square (1.6315) has a p-value (0.442) greater than the significance level of 0.05. This meant that the sex of graduate students did not have any impact on their stress levels.

4.9.3 Association between marital status and level of stress

Table 4.7: Association between marital status and level of stress

Marital status	High	Average	Low	Chi-square	p-value
Divorced	1	1	0	4.730	0.316
Married	7	35	4		
Single	4	25	0		

Source: Field Study (2022)

Table 4.7 showed that the test revealed no statistically significant relationship between the stress level of graduate students and marital status, given that the Chi-square (4.370) has a p-value (0.316) greater than the significance level of 0.05. This meant that the marital status of graduate students did not have any bearing on their stress levels.

4.9.4 Association between educational funding type and level of stress

Table 4.8: Association between educational funding type and level of stress

Funding Type	High	Average	Low	Chi-square	p-value
Parent	0	1	1	0.000	45
Scholarship	1	1	0		
Self-funded	6	44	2		
Study leave with pay	5	15	0		

Source: Field Study (2022)

As shown in Table 4.8, the test revealed no significant relationship between educational funding type and level of stress, given that the Chi-square (0.000) has a p-value (45) greater than the significance level of 0.05. This meant that the source of funding for graduate studies among graduate students had no impact on their stress levels.

4.9.5 Association between fear of contamination and level of stress

Table 4.9: Association between fear of contamination and level of stress

Fear of contamination	High	Average	Low	Chi-square	p-value
Extremely stressful	1	3	0	14.675	0.023
Moderately stressful	3	26	0		
Somewhat stressful	0	14	3		
Very stressful	8	18	1		

Source: Field Study (2022)

As shown in Table 4.9, the test showed a significant relationship between fear of contamination and level of stress, given that the Chi-square (14.675) has a p-value (0.023) less than the significance level of 0.05. This meant that the source of fear of contamination among graduate students had no impact on their stress levels. A linear regression analysis performed established that fear of contamination with COVID-19 failed to statistically significantly predict the level of stress ($F(1, 75) = 1.17$, $p = 0.283$), and fear of contamination with COVID-19 accounted for 15% of the explained variability in level of stress. This meant that fear of contamination with COVID-19 had no statistically significant impact on stress levels.

4.9.6 Association between the conduct of online learning and level of stress

Table 4.10: Association between the conduct of online learning and level of stress

Online learning	High	Average	Low	Chi-square	p-value
Yes	11	39	3	1.9911	0.370
No	2	21	1		

Source: Field Study (2022)

Table 4.10 showed that the test revealed no significant relationship between the conduct of online learning and the level of stress, given that the Chi-square (1.991) has a p-value (0.370) greater than the significance level of 0.05. The results indicated that the conduct of online learning did not have any bearing on the outcome of stress levels.

Table 4.11: Coping skills of graduate students

Coping skills	Frequency (n)	Percent (%)
Follow strict personal protective measures.	68	88.3
Read about COVID-19 prevention and transmission.	39	50.6
Avoid going out in public	26	33.8
Do relaxation activities	21	27.3
Pray, worship, and read religious books	21	27.3
Chat with family and friends	31	40.3
Use social media (TikTok, Facebook, Instagram, etc.)	14	18.2
Play online games	5	6.5
Talk and motivate myself	16	20.8
Get help from a family physician	5	6.5
Try to be busy at home	10	13
Avoid media news about COVID-19	7	9.1
Vent emotions by crying, screaming, etc.	1	1.3

Source: Field Study (2022)

The strategies employed by the respondents to cope with the stress of the COVID-19 pandemic included following strict personal protective measures (masking, hand hygiene,

etc.) (88.3%), reading about COVID-19, its prevention, and mechanism of transmission (50.6%), chatting with family and friends (40.4%), avoiding going out in public (33.8%), relaxation exercise (27.7%), praying, worshipping, and reading religious books (27.7%), and self-talk and motivation (20.8%).

CHAPTER FIVE

DISCUSSIONS

5.1 Introduction

This chapter includes a discussion of the findings alongside the relevant literature. The first segment focuses on the demographic characteristics of the respondents while the second focuses on the results concerning the study objectives.

5.2 Demographic characteristics

The study found that 77 (83%) out of 93 graduate students participated in the research. The majority (77%) of respondents were between the ages of 20 and 40. This is in line with a 2021 study by the University of British Columbia, which found that 90.5% of master's degree candidates are between the ages of 20 and 39. The Council of Graduate Schools revealed that 60.1% of graduate students were female and 39.9% were male. In the current study, however, 55.8% of the participants were male and 44.2% were female. According to Sasu (2021), this could be due to the gender education gap in Ghana. In this study, 59.7% of participants were married, and 67.5% self-funded their education. This is consistent with the findings of Baum and Ma (2012), who found that graduate students usually self-fund their education and other financial obligations (Esielfi & Kwaah, 2017; Farhana et al., 2020).

5.3 Stress level of graduate students

The majority (77.9%) of study participants scored average on the overall stress scale. A score of 7 to 15 on the CSSQ Global Stress Score is indicative of an average score. The mean scores for academic experience, social isolation, and family relationships were the highest in this study. Although academic experience demonstrated a weak but positive

correlation (r = 0.21, n = 77, p > 0.06), social isolation demonstrated a weak but negative correlation (r = -0.202, n = 77, p > 0.08). The study found that relationship with family did not correlate with stress level (r = 0.018, n = 77, p = 0.87). This indicates that none of these stress factors had a statistically significant effect on the stress level.

In contrast, Zurlo et al. (2020) found that students were compelled to live fully with their families throughout the pandemic. This was primarily due to the pandemic restrictions and lockdown, which required people to study and work from home. For instance, family members may be working from home, while university accommodations were closed due to social distancing measures. Students also had to find quiet places to study and concentrate at home (Sahu et al., 2020) and deal with internet connectivity issues and limited interaction with colleagues and lecturers (Chen et al., 2020). All of these factors contributed to graduate students' stress levels.

5.4 Association between Demographic variables and Stress

The study found no statistically significant association between age, sex, marital status, and stress levels. This indicated that there were no differences in stress levels between the various age groups, sexes, and marital statuses. Chen et al. (2018) found that the effects of stress on different age groups vary. Younger adults were stressed about school and school-related challenges, middle-aged adults about work, and older adults about their health (Chen et al., 2018).

The results indicate that there is no significant association between marital status and stress levels among graduate students. This contradicts the findings of Gafoor et al. (2020), who found that both married and single graduate students experienced stress, but that the stress had different causes. Married students were stressed when competing for research

experience and academic performance, whereas single students were stressed about their future careers, academic responsibilities, and confidence in their abilities. In contrast, the study by Essilfie and Kwaah (2017) found that married distance education students in Ghana experience financial constraints related to accommodation, school fees, transport, and food. These challenges, along with the need to balance work and personal life, contribute to heightened stress levels. Conversely, Nuako et al. (2009) concluded that married students benefit from social support, which mitigates their likelihood of experiencing stress.

The study showed no significant relationship between educational funding type and graduate student stress (X^2 = 0.000, p-value = 45). This finding suggests that the type of educational funding did not have a significant effect on the stress levels experienced by graduate students. This contradicts the findings of Heckman, Lim, and Montalto (2014), who, in a study of 4488 college students, found that financial stress was a primary concern for the majority (71%) of college students. Kwaah and Essielfie (2017) concluded that financial stress was prevalent among all students in their studies.

5.5 Relationship between Fear of Contamination and level of Stress

The study revealed that graduate students' fear of contamination was a predictor of their stress levels (X^2 = 14.67, p-value = 0.023). This suggests that the fear of COVID-19 contamination affected the stress levels of graduate students. Baloran (2020), who conducted a study among dental students to determine the effect of anxiety from COVID-19 on stress, found that 61.6% of respondents believed they were at a high risk of contracting the virus. As SARS, H1N1, and Ebola have shown in the past, the spread of any infectious disease causes psychological distress, anxiety, and other mental health

symptoms and has the potential to cause fear and anxiety, leading to stress (Bali et al., 2020; Di Crosta et al., 2020; Islam et al., 2020). The fear and anxiety that COVID-19 causes are similar to those that SARS and Ebola cause. This is consistent with Taghir and Bozani (2020), who found that the majority of Saudi Arabian students exhibit fear and anxiety related to COVID-19. Similarly, Arhorsu et al. (2020), Liam et al. (2020), and Wang et al. (2020) found that more than 86% of the respondents experienced COVID-19-related fear and anxiety. However, a linear logistic regression conducted in this study revealed that fear of contamination with COVID-19 did not statistically predict the level of stress ($F(1, 75) = 1.17$, $p = 0.283$). This study failed to establish a correlation between the fear of contracting COVID-19 and stress.

5.6 Association between online learning and stress

Faced with the COVID-19 pandemic, educational institutions resorted to electronic or online learning to facilitate teaching and learning (Mheidly & Fares, 2020; Sahu, 2020), deliver educational content, actively engage students, and administer assessments (Mukhtar et al., 2020). Several studies have been conducted on online learning during this pandemic and have concluded that online learning is faced with many challenges that contribute to student stress (Alruwaiss et al., 2018; Anwar & Kainat, 2020; Mukhtar et al., 2020; Farhana et al., 2020; Ebohun et al., 2021; Adjei & Ankrah, 2020). Poor internet connectivity, lack of internet connection, high internet charges, and lack of access to computers and other internet-enabled devices were cited as obstacles by respondents. The study revealed that there was no statistically significant correlation between online learning and graduate student stress ($X^2 = 1.99$, p-value = 0.370). Thus, whether students concur or disagree with the conduct of online learning has no bearing on their stress levels. This

contradicts the findings of Begum et al. (2020), who found that Bangladeshi students were not interested in participating in online learning due to obstacles such as slow internet speed, a lack of internet-enabled devices, and financial constraints caused by the pandemic. This is a stressful experience for students because they have to reconnect multiple times during virtual classes due to poor connectivity, preventing them from fully participating and limiting their interaction with colleagues and peers (Ebohun et al., 2021; Adnan & Anwar, 2020; Darko-Adjei & Ankrah). Fear of contamination with COVID-19, a delay in the start of the academic calendar, and the opportune time for online learning persuaded participants in this study to consent to the implementation of online education. This is because all graduate students admitted to the 2020–2021 academic year were anxious to start the academic year due to delays from COVID-19.

5.7 Coping strategies

Following strict personal safety precautions was the primary coping mechanism among graduate students in this study (88.3%), then reading about COVID-19, its prevention, and transmission (50.6%), speaking with family and friends for social support (40.3%), avoiding going out in public (33.8%), engaging in relaxation exercises (27.3%), and praying, worshipping, and reading religious books (27.3%). Students in this research employed various coping strategies. This meant that students were cognizant of the significance of adhering to the precautionary measures established by WHO to prevent the transmission of the virus (WHO, 2020). As a paucity of information amid a pandemic of this nature causes anxiety and stress, reading about COVID-19 to acquire more information helped to alleviate anxiety and stress. This is consistent with a study by Baloran (2020), which found that 90.19% of the respondents took strict personal protective measures to

deal with the stress of the pandemic, followed by 80% of those who avoided going out in public, and stated that it was of the utmost importance for individuals to adhere to strict infection prevention practices, in addition to standard precautions to minimise public exposure. This is not consistent with Blakey et al. (2015), who concluded that knowledge about Ebola did not predict Ebola-related fear among US citizens and that awareness of safety behaviour did not indicate that fear was reduced. Seeking social support from family and peers also assisted students in coping with COVID-19-related stress.

CHAPTER SIX

CONCLUSIONS AND RECOMMEDATIONS

6.1 Introduction

This chapter centers on the conclusion of the study, implication for research, policy and education. The limitation of the research and recommendations based on the findings of the study is also included.

6.2 Conclusion

The study concluded that graduate students experienced moderate stress levels on the global stress score. The study found no significant correlation between graduate students' stress levels and their ages, sex, or marital status. The educational funding type had no statistical significance for graduate students' stress levels.

Factors contributing to stress (fear of contamination, social isolation, relationship with family, relationship with lecturers, relationship with colleagues, and academic experience) and online learning did not affect the stress level of graduate students. Fear of contamination and online learning were not statistically significant predictors of graduate students' stress levels. The findings indicate that a certain level of fear is necessary to promote positive precautionary behaviour among graduate students to prevent the spread of the virus.

Following strict personal protective measures (hand washing, masking, social distancing, etc.), reading about COVID-19 prevention and transmission, and conversing with family and friends for social support were the most frequently used strategies for graduate students to cope with stress caused by COVID-19-related factors. Average stress is good stress (eustress). It has psychological, emotional, and physical benefits. It helps students remain

motivated, achieve their objectives, and feel positive about their lives. Graduate students should be encouraged to use beneficial stress, particularly during pandemics.

6.3 Implication for study

Findings of this study have implications for guidance and counselling at the graduate level. These implications are discussed under research, policy making practice, management and education.

6.3.1 Implication for research

The results indicated that graduate students experienced moderate stress due to the COVID-19 pandemic. Therefore, research should be conducted to guide the discussion on how these stressors can be monitored and managed for future health emergencies, to prevent them from causing debilitating mental health conditions. New and emerging stressors, such as fear of contamination, can also be studied to determine the dynamics of stress related to the pandemic and prevent this fear from developing into phobias.

6.3.2 Implication for policy making

The findings indicate that students experienced moderate stress levels, which is beneficial. This is because it motivates students to achieve academic excellence and attempt great things; consequently, student counselling services should be maintained but strengthened, and their virtual availability should be expanded beyond office hours. Also, the school administration should implement peer counselling and support services to provide counselling services to fellow students, as students find it easier to speak to their peers.

6.3.3 Implication for Education

The results suggest that graduate students will always experience stress. The presence of a pandemic of such a catastrophic nature will add stress to existing sources of stress. Stress and stress management should not be limited to a few hours of seminars and symposia but should be incorporated into the graduate curriculum.

6.4 Limitations of the study

1. The response rate was low. Therefore, the results cannot be generalised.
2. This research was limited to one school at the University of Ghana and did not aim to compare or draw comparisons among graduate students from other schools in the university community. Therefore, it is not representative of all university graduate students.
3. The research was also conducted after the initial intense phase of the pandemic had passed, and graduate students may have come to terms with the pandemic, which may have affected the outcome of the stress levels experienced by graduate students.

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APPENDICES

APPENDIX A: QUESTIONNAIRE

Dear Sir/Madam,

I am conducting a study on the Determinants of Stress among Graduate Students from the University of Ghana School of Public Health amid COVID-19. I would appreciate it if you could take a moment of your time to fill out this questionnaire. There is no right or wrong answer. Any information you provide is private and confidential. This study is for academic purpose only and your participation is entirely voluntary.

INSTRUCTIONS

Please tick (√) your choice in the boxes, circle (O), or write in the spaces provided.

SECTION A: DEMOGRAPHIC CHARACTERISTICS

1. Age: 20-30yrs [ ] 31-40yrs[ ] 41-50yrs[ ] 51-60yrs [ ]
2. Sex: Male [ ] female[ ]
3. Marital Status: Single[ ] Married [ ] Divorced[ ] Widowed[ ]
4. Programme / Dept.

   ……/……
5. How do you fund your education? Self [ ] Study leave[ ] other[ ]

SECTION B: FEAR OF CONTAMINATION

No.	Factors/items	Not at all stressful	Somewhat stressful	Moderately stressful	Very stressful	Extremely stressful
1	How do you perceive the risk of contagion during this period of COVID-19 pandemic?	0	1	2	3	4
2	How do you perceive the condition of social isolation imposed during this period of COVID-19 pandemic?	0	1	2	3	4
3	How do you perceive your relationships with your relatives during this period of COVID-19 pandemic?	0	1	2	3	4

4	How do you perceive your relationship with your university colleagues during this period of COVID-19?	0	1	2	3	4
5	How do you perceive your relationship with your university professors during this period of COVID-19	0	1	2	3	4
6	How do you perceive your academic experience during this period of COVID-19	0	1	2	3	4
		-------+	-------+	-------+	-------+	-------+
		Global stress score -------+				

SECTION C: STUDENTS' ATTITUDES TOWARD SCHOOLING DURING COVID-19 PANDEMIC

1. Do you agree with the conduct of the on-line Learning Approach during the pandemic? Yes [ ] No [ ]
2. The reasons for saying **"YES"** to Online Learning
    a. I want to finish my academic requirements
    b. I don't want to quit school
    c. Online classes and modules are more convenient and practical than going to school
    d. It is about time to use online-blended education especially during a crisis like this
    e. It would be safe to study at home than to go to school
3. The reasons for saying **"NO"** to Online Learning
    a. I don't have an internet connection
    b. I don't have personal computers and smartphones
    c. I find online class and modules challenging to do
    d. I would still prefer learning inside the classrooms
    e. I find online classes and modules boring
    f. I cannot learn through online class and modules
    g. I don't have a personal interaction with my teacher and classmates
    h. I don't have budget or finances for an online class and online submissions of requirements/tasks

SECTION D: STUDENTS' PERSONAL COPING STRATEGIES DURING COVID-19 PANDEMIC.

1. Which among the following do you adopt to cope with stress?
    a. Read about COVID-19, its prevention and mechanism of transmission
    b. Avoid going out in public places to minimize exposure from COVID-19
    c. Do relaxation activities, for example, involved in meditation, sports, exercise, music, etc.
    d. Praying, worshiping and religious book study
    e. Chat with family and friends to relieve stress and obtain support
    f. Use social media and social networks such as Facebook, Twitter, TikTok, YouTube, etc.
    g. Play online games and computer games
    h. Talk and motivate myself to face the COVID-19 outbreak with a positive attitude
    i. Get help from family physicians or other doctors to reduce my stress and get reassurance
    j. Try to be busy at home in activities that would keep my mind away from COVID-19
    k. Avoid media news about COVID-19 and related fatalities
    l. Vent emotions by crying, screaming, etc.

APPENDIX B: CONSENT FORM

Title of the study:

DETERMINANTS OF STRESS AMONG GRADUATE STUDENTS FROM THE UNIVERSITY OF GHANA SCHOOL OF PUBLIC HEALTH AMID COVID-19

Principal Investigator

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NB: YOU CAN CONTACT DANIEL ABANKWA, ADMINISTRATOR, COLLEGE OF HEALTH SCIENCES–EPRC ON TEL: 0249534022 FOR ANY FURTHER CLARIFICATION

Background

Students face stress every day throughout their academic life at the University as established in previous studies with known stressors such as funding their education, balancing work with academic life, and attaining and maintaining higher grades. The onset of COVID-19 introduced new challenges to students as they had to migrate to fully online learning mode. Online learning also comes with burdens, such as the acquisition of internet devices, poor internet connectivity, and data costs. The aim of this study is therefore to examine the determinants of stress among graduate students amid COVID-19.

Nature of the study

The study will be a quantitative cross-sectional study aimed at examining the determinants of stress among graduate students amid COVID-19 at the School of Public Health, University of Ghana, from August 2021 to March 2022. 93 graduate students are expected to participate.

Participants' information

This study is planned to probe graduate students at the School of Public Health using a well-ordered questionnaire developed online. You will be expected to fill out the questionnaire truthfully. The information you provide will only be used for the purpose for which this study is being undertaken.

An average of 20 minutes is required to be spent taking part in this study.

Potential risks

The study will ask for your source of funding for your education. However, no direct risk is anticipated. You may skip any information that you are not comfortable with.

Benefit

There is no direct benefit for participants in this study, but the information provided will contribute knowledge on the causes of stress occurring among students during the COVID-19 pandemic and provide data to school authorities when planning for student counselling and support services at the school.

Cost

The researcher is responsible for paying the costs associated with this study, which also include those associated with the acquisition of internet data, the creation of the

questionnaire, travel to and from the study site, per diem for research assistants, and other expenses.

Compensation

No compensation exists for being part of this study.

Confidentiality

Disclosure of your name is not a requirement in this study. The information that you will provide will be coded and treated with the utmost confidentiality. No one apart from the researcher, research assistants, or supervisor will have access to the information, whether in part or whole.

Data collected will be stored, kept under lock and key, and subsequently destroyed after 3 years, as per protocol.

Voluntary participation or withdrawal

Your participation in this study is voluntary, as your consent will be sought before your participation. You are at liberty to opt out of the study at any time without any repercussions. You are kindly encouraged to fully participate.

Outcome and feedback

The data obtained will solely be used for this study. Results, findings, and recommendations would be available at the School of Public Health Library.

Funding

The researcher is funding this research.

Conflict of interest

I declare no conflict of interest.

Sharing of participant information

The researcher will own the data from this study. The information you provide will be the intellectual property of the researcher, which will be shared with my supervisor through meetings and correspondence. Other stakeholders will also be privy to the data from this study.

Please note: You will receive a copy of the information sheet and consent form after you have signed or thumb-printed them for your records.

In the event of any concern, the following contact information has been provided:

Please note: You will receive a copy of the information sheet and consent form after you have signed or thumb-printed them for your records.

In the event of any concern, the following contact information has been provided:

If you have any questions about your rights as a research participant, you can contact the EPRC Office between the hours of 8 a.m. and 5 p.m. at **+233 [030] 294 0528, +233 [030] 266 5103**, or by email at **eprc@chs.edu.gh**.

I acknowledge that I have read or had the entire methodology and purpose of the study being undertaken explained to me by Agartha Obeng, who is the researcher, in English or a language I understand. I fully understand the contents of the study and its implications, and I therefore consent to being part of the study.

I am aware of and agree to partake in this study. I understand the pretext that it is under strict confidentiality. I can also opt out of the study at any time, even after signing this form.

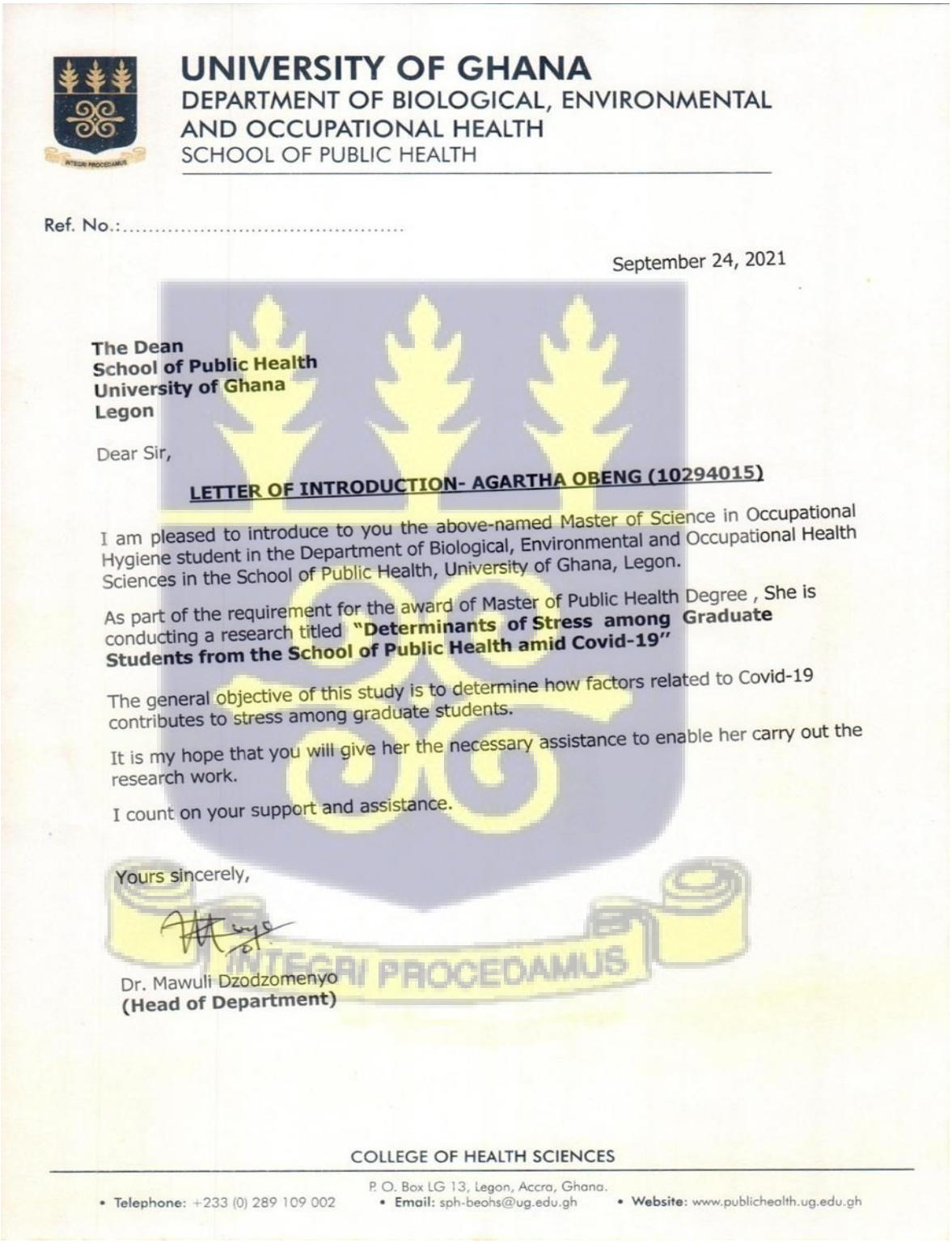
I agree to be part of this study voluntarily.

Participants name /initials…… Serial No. ……

Participants Signature ……..

Date ……..

APPENDIX C: INTRODUCTORY LETTER



UNIVERSITY OF GHANA
DEPARTMENT OF BIOLOGICAL, ENVIRONMENTAL AND OCCUPATIONAL HEALTH
SCHOOL OF PUBLIC HEALTH

Ref. No.:.....

September 24, 2021

The Dean
School of Public Health
University of Ghana
Legon

Dear Sir,

LETTER OF INTRODUCTION- AGARTHA OBENG (10294015)

I am pleased to introduce to you the above-named Master of Science in Occupational Hygiene student in the Department of Biological, Environmental and Occupational Health Sciences in the School of Public Health, University of Ghana, Legon.

As part of the requirement for the award of Master of Public Health Degree , She is conducting a research titled **"Determinants of Stress among Graduate Students from the School of Public Health amid Covid-19"**

The general objective of this study is to determine how factors related to Covid-19 contributes to stress among graduate students.

It is my hope that you will give her the necessary assistance to enable her carry out the research work.

I count on your support and assistance.

Yours sincerely,

Dr. Mawuli Dzodzomenyo
(Head of Department)

INTEGRI PROCEDAMUS

COLLEGE OF HEALTH SCIENCES

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