THE IMPACT OF COVID_19 ON THE MENTAL HEALTH OF UNIVERSITY STUDENTS: A LITERATURE REVIEW

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ABSTRACT

Background: Mental health is a very important aspect of university students' health. This study was conducted to access and summarize the extent of research already conducted on the impacts of Covid_19 pandemic on the mental health of university students.

Methods: For the purpose of the study, an extensive literature review was conducted using PubMed as the major source of data. The specific objectives of the study include explaining the concept of mental health, review relevant theory to explain the effects of Covid_19 on the mental health of individuals, review relevant scientific journals in order to summarize the extent of work that has been conducted on the topic and determination of ways to reduce and/or eliminate the effects of Covid_19 pandemic on university students. This review of relevant literature was done not only to identify the gap in literature but also to assess and summarize the level of data available.

Results: The major results of the study showed that the impacts of covid_19 on the mental health of university students includes increased level of anxiety, stress, depression, post-traumatic stress disorder, increased experience of suicidal ideation, poor changes in sleep pattern, impact on the quality of life, and a period of uncertainty and fear.

Recommendation and Conclusion: It is recommended that increased effort should be made by universities, health practitioners, the general population, policy makers and government to further improve and promote the mental health of university students as well as the public through the conduction of more studies including prospective cohort studies to provide evidence-based stress relieve strategies, mental rehabilitation and increased mental health care accessibility both online and physically.

DEDICATION

This master's thesis is dedicated to the Almighty God, Our Mother of Perpetual Help and to my Family.

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CHAPTER ONE

INTRODUCTION

1.1 Background of Study

The mental health of students is an aspect of students health which is of unique interest (Fountoulakis et al., 2020). There has been an increasing concern on the mental health of university students, this concern has further increased as a result of the Covid_19 pandemic (Son et al., 2020). Covid_19 and the lockdown associated with the prevention of its spread has led to an increased feeling of anxiety and fear around the world (Singh et al., 2020). The result of this is a short and long term changes in the mental health of vast majority of the public (Singh et al., 2020). The student population is one major group affected by the Covid_19 pandemic.

Covid_19 has brought about notable challenges for higher education and major interference in teaching as well as learning (Dodd et al., 2021). Being a major outbreak occurring in the 21st century, Covid_19 has led to novel hazards to the mental health of the public. Though mental health support is made available to affected patients and health personals, the mental health of other members of the society also requires attention (Xiong et al., 2020).

Coronavirus disease (Covid_19) is a viral infection firstly identified in Wuhan (Hubei Province, China) in December 2019. Shortly after it was detected, it spread within some parts of China and then throughout the world, making it a pandemic (Odriozola-González et al., 2020). The situation thus generated a noticeable impact on the emotional and psychological well-being of not only health workers but also the general population. This impact was expressed mainly through symptoms of stress, anxiety and depression (C. Wang, Pan, Wan, Tan, Xu, Ho, et al., 2020).

Covid_19 has affected the lives of individuals around the world in an unprecedented manner (Shen et al., 2020). It has led to a great deal of concern and is classified as a global public health emergency. Although a lot of resources has been channeled towards controlling its effect and towards the treatment of infected individuals, much less attention has been channeled into controlling and avoiding the negative impact of the situation on the mental health of the public as well as strategies to improve the already affected mental health (Zhang et al., 2020).

The measures to avoid the spread of the infection such as social distancing, isolation and lockdown were implemented throughout the world (Shen et al., 2020). The lockdown which involved the closure of schools and various educational institutions lead to an increased amount of anxiety, fear as well as increased stress levels in students around the world (Singh et al., 2020). This thus affects their mental health.

According to some reports, the impact of Covid_19 on the mental health is more in students (Song et al., 2021). The student's population is vulnerable during this challenging period because of the age group which students generally fall. Also, the interruption during their study period can be linked to long term consequences which in turn can set off feelings of worry, stress and fear (Fountoulakis et al., 2020). University students trying to adapt to the new study environment and requirements generally experience a wide variety of ongoing stressors and transitional events. These stressors can affect their mental health and educational performance (Dantzer, 2012).

Stressful situations such as that experienced during the period of the Covid_19 pandemic is known to affect significantly the mental well-being of individuals, this can lead to Post-traumatic Stress Disorder as well as some other mental health challenges (Hao et al., 2020; Tan et al., 2020; C. Wang, Pan, Wan, Tan, Xu, Ho, et al., 2020). According to Mamun et al. these mental health challenges if not attended to account for ninety percent suicide occurrence worldwide in extreme cases (Mamun et al., 2020). Research also shows that students between 12 to 21.4 years of age express an increased mental health impact of the Covid_19 pandemic compared to employed individuals, this may be caused by long period of lockdown of schools, the need for online educational support and uncertainty about examination. Students fear for health, stigma and feeling of helplessness were likely to be experienced (Ng et al., 2020; C. Wang, Pan, Wan, Tan, Xu, McIntyre, et al., 2020). The effects are particularly different for international/migrant students as many of them do not have adequate support system in their study country.

Although various research exists on the impacts of Covid_19 on the mental health of various population, there is need for more extensive literature review in order to determine the extent of work that has been done in this area as well as to summarize these existing works. Thus, this study aims to fill this gap in literature.

This project will therefore aim to review various relevant literatures in an attempt to identify, assess and summarize the level of data already available and thus has the following research objectives:

a). explaining the concept of mental health.

b). review relevant theory to explain the effects of Covid_19 on the mental health of individuals.

c). review relevant scientific journals in order to summarize the level of work that has been conducted on the topic.

d). determination of ways to reduce and/or eliminate the effects of Covid_19 pandemic on the mental health of university students.

1.2 Research Questions

a. What are the impacts of Covid_19 on the mental health of university students?
b. What are the risk factors that increases the effects of Covid_19 on the mental health of university students?
c. What are the recommendations to improve the already affected mental health of university students?

1.3 Scope of Study

The study reviews the impacts of the Covid_19 pandemic on the mental health of university students around the word. It reviews literatures aimed at summarizing the existing research already conducted as well as to identify the gaps in literatures.

1.4 Significance of Study

This study assesses the impacts of Covid_19 on the mental health of university students and students in general. It also brings to light the new challenges experienced by these group of students following the restrictions, change in learning and teaching techniques and repeated lockdown.

It is important that these factors are taken seriously by government agencies, school counselors as well as healthcare personnel as this would go a long way towards helping students maintain resilience during the period of the pandemic.

CHAPTER TWO

LITERATURE REVIEW

This chapter presents a review of scholarly works related to the impact of Covid_19 on the mental health of university students. This literature review is presented in four parts: the conceptual review, the theoretical review, the empirical review, and the summary of literature review.

2.1 Conceptual Review

2.1.1 Concept of Mental Health

Mental health is the basis for the well-being and proper functioning of individuals and involves more than the absence of a mental illness. The comprehension of ones emotions and effective reaction to the emotions of other individuals as well as the ability to effectively reason and learn all constitute a healthy mental health (*Mental Health*, n.d.-a). According to the World Health Organization (WHO), "Mental health is a state of well-being in which an individual realizes his or her own abilities, can cope with normal stresses of life, can cope with the normal stresses of life, can work productively, and is able to make a contribution to his or her community"(*Mental Health*, n.d.-b). Optimal mental health is linked to both mental and psychological well-being and involves the psychological, social, and emotional health. It plays a role in the thought process, feelings and actions of every individual and determines how individuals interact with one another, manage stress, and make decisions. It is therefore important at every developmental stage of life from infancy, childhood, adulthood and old age (admin, 2020).

Mental health is a very important constituent of health as there is no complete health without mental health. The WHO recognizes its importance as seen in their definition of health as "A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"(*Mental Health*, n.d.-b). Mental health forms the bases to the ability of individuals and society to reason, feel, work, and communicate with one another and therefore live a meaningful life. Therefore it is paramount that individuals, communities and societies focus on effectives ways to promote, protect and rehabilitate the mental health (*Mental Health*, n.d.-b).

2.1.2 Determinants of Mental Health

The mental health of an individual at any point in time can be determined by various factors ranging from biological, social and psychological factors (*Mental Health*, n.d.-b).

It is important to note that the mental health of an individual can change at different stages of life. Poor mental health can be linked to rapid social change and stressful situations such as different forms of abuse example physical, sexual, violation of human right, discrimination, poor lifestyle choices, physical illness, and social-economic stress. Other determinants of mental health are specific personalities, genetics and psychology of individuals that increases the vulnerability of these individuals to mental illnesses (*Mental Health*, n.d.-b).

2.1.3 Mental Health Promotion and protection

Mental health promotion deals with various activities aimed at enhancing the mental and psychological well-being of individuals. In most cases it involves the reinforcement and/or creation of suitable environment which supports development of healthy mental health. A suitable environment is one that protects and takes into consideration the civil, cultural, political, and socio-economic rights of individuals and general populatuion. This environment provides the freedom and security essential for maintaining a good level of mental health and should be an important focus of policy makers (*Mental Health*, n.d.-b) .

Mental health laws and policies should not only focus on the prevention and/or rehabilitation of mental illnesses but should also focus on innovative ways and intervention aimed at promoting the mental health of the people (*Mental Health*, n.d.-b)

The promotion of healthy nationwide mental health should be inculcated in both non-governmental and governmental policies and activities. It should involve other sectors of the economy in addition to health such as education, transport, justice, environment, welfare, and housing sectors.

Specific ways to promote mental health according to WHO (*Mental Health*, n.d.-b)

    a. Early childhood intervention: This involves bringing up children in a suitable and stable environment with adequate nutritional needs, emotional support, adequate development stimulus, protection from threats, adequate opportunities for early learning and responsible and responsive interaction.

b. Adequate support to children: This includes programs such as children and adolescent development programs, adequate skill development programs.

c. Women empowerment: This includes making accessible various tools and programs that empower women both socially and economically such as increasing access to education and financial empowerment.

d. Support for the elderly population: this includes social supports such as community and day activity center for the elderly, interaction initiatives.

e. Specific programs for vulnerable group of individuals: This group of individuals include minorities, migrants, individuals affected by disaster and conflict and indigenous people.

f. School activities for promotion of mental health: An example of such programs include the supportive ecological changes in school.

g. Mental health promotion at work: such as stress reduction and prevention programs.

h. Housing policy: better housing policy

i. Prevention of abuse and violence: decreasing alcohol and drug availability, reducing and preventing access to arms.

j. Community development activities and programs: such as community mobilization in rural development.

k. Reduction of poverty and protection of the poor.

l. Campaigns, policies, and laws that prevent discrimination.

m. Adequate treatment and care of the mentally ill, promotion of rights and opportunities.

2.1.4 Treatment and care of Mental health

The development and implementation of mental health laws and policies should not only focus on the promotion, protection and enhancement of the mental health of the public but should also focus on the requirements of individuals already diagnosed with mental illness (*Mental Health*, n.d.-b).

Various research emphasizes the cost-effectiveness and efficacy of certain key mental illness interventions at different economic level. Such cost-effective interventions include treatment of mild cases of depression with psychological treatment while moderate to severe cases of depression are treated with anti-depressant medications, increased tax on alcoholic beverages , cigarettes and drugs , restriction of advertising of such products as well as restricting their

availability, and the use of psychosocial support and antipsychotic medication in the treatment of psychosis (*Mental Health*, n.d.-b).

There exists a variety of effective programs aimed at suicide prevention, and treatment of mental illness in children, prevention of dementia, treatment of dementia and treatment of addictive disorders and disorders of substance use. Also, the use of evidenced-base mental health Gap Action Program (mhGAP) is an to guide non mental health specialist recognize and manage mental health challenges should be enforced(*Mental Health*, n.d.-b).

2.1.5 Concept of Coronavirus Pandemic (Covid_19) (*Coronavirus*, n.d.)

Coronavirus disease (Covid_19) is a viral infection firstly identified in Wuhan (Hubei Province, China) in December 2019. Shortly after it was detected, it spread within some parts of China and then throughout the world, making it a pandemic (Odriozola-González et al., 2020). Covid_19 is a viral infectious disease which is caused by a coronavirus. The Covid_19 virus can be transmitted via droplet spread from discharge from the nose or via saliva. One way the infected droplets can be released is when an infected person sneeze or cough, therefore, the practice of good sneezing and coughing technique through flexing one's elbow is important. The viral infection in most cases is characterized by mild-moderate respiratory illness and recovery usually occurs without requiring special treatment. Severity of symptoms can occur as a result of presence of underlying medical conditions such as diabetes, cancer, and chronic respiratory disease (*Coronavirus*, n.d.). The Covid_19 infection can have different effects on different individuals. The most common symptoms include: fever, fatigue, and dry cough. The less common symptoms include: aches and pains, diarrhea, loss of taste or smell, conjunctivitis, sore throats, rash on skin, discoloration of fingers and toes and headaches. Serious symptoms include: loss of speech or movement, difficulty breathing or shortness of breath, and chest pain or pressure. The incubation period of the viral infection is 5-14 days. It is important to seek medical treatment if one experiences the serious symptoms (*Coronavirus*, n.d.). Reduction of transmission and prevention of Covid_19 can be done through effective hand washing with soap and clean water, effective use of alcohol-based disinfectant suitable against viral infection, social-distancing (maintaining a safe distance of at least 1 meter) , avoiding unnecessary travel, avoiding hand contact with your face, practice safe coughing and sneezing technique by covering ones nose and mouth and staying at least one meter

from someone coughing or sneezing, wearing a face mask, proper room ventilation, avoiding crowds, being well-informed about the Covid_19 virus and its prevention of spread by using creditable news outlets, remaining indoors if one feels unwell, avoiding smoking or other activities that may affect the lungs etc (*Coronavirus*, n.d.).

2.2 Theoretical Review

2.2.1 The Chain Mediation Model

The chain mediation model by C. Wang et al., 2021 is a model formed based on already existing theoretical perspectives and was developed during the Covid_19 pandemic through the comparison of the mental health outcomes of the general population in eight countries (China, Pakistan, the Philippines, Iran, Poland, Spain, the US and Vietnam) (C. Wang et al., 2021). The chain mediation model consists of five hypothesis which was tested during the study, they include:

a. The physical symptoms similar to that of Covid_19 would be positively related with adverse mental health outcome (stress, anxiety and depression).
b. The need for health information would intervene in the association between physical symptoms and adverse mental health outcomes.
c. The perceived impacts of the Covid_19 pandemic would determine the association between the physical symptoms and adverse mental.
d. The need for health information and perceived impact of the pandemic would be sequential determinants of the association between physical symptoms and adverse mental health outcome.
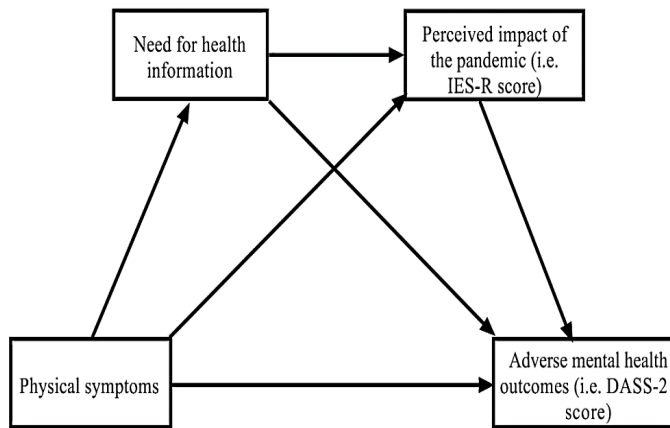
Figure 1: Proposed chain mediation model to explain the association between physical symptoms similar to Covid_19 infection and adverse mental health outcomes (stress, anxiety and depression) (C. Wang et al., 2021).

Following the results of the study (C. Wang et al., 2021), the Chain mediation model thus states that:

a. Physical symptoms similar with Covid_19 has a significant and positive relationship with the need for health information.

b. Both physical symptoms similar with Covid_19 and the need for health information has significant and positive relationship with the perceived impact of the pandemic.

c. The physical symptoms similar with Covid_19, the need for health information, and the perceived impact of the pandemic were significantly and positively linked to the mental health outcomes of stress, anxiety, and depression.

d. The chain mediating effect of the need for health information and the perceived impact of the Covid19 pandemic between physical symptoms and all three mental health outcomes of stress, anxiety and depression were all significant.

2.2.2 Application of the Chain mediation model to the study

Individuals who exhibit symptoms similar with that of the Covid_19 pandemic become uncertain and very curious about their health, they tend to seek more information about the pandemic and about their health in general in a way to avoid negative impact of the pandemic through upholding measures to reduce the risk of infection and enhance feeling of well-being. In some cases this

action can increase resilience (C. Wang et al., 2021). However, the presence of physical symptoms similar with Covid_19 and increased health knowledge regarding its prevention and recovery could in turn impact on the individual's mental health, this is due to the presence of a wide range of information available in the media, some of which are contradictory and inaccurate(C. Wang et al., 2021), this can lead to mental health outcomes of increased stress, anxiety or depression, thus affecting their mental health. This effect can be even more stressful and severe for international students who are already distant from home and face various challenges of integrating to their new country of residence.

2.3 Empirical Review

Researchers have used a variety of methods and definitions to assess the impacts of Covid_19 pandemic on the mental health of Students world-wide.

In the study of (Singh et al., 2020) aimed at determining the impact of Covid_19 and lockdown on the mental health of children and adolescents, a narrative review of different articles related to the impact of Covid_19 and the mandatory lockdown was done. These articles were arranged thematically as major findings were categorized under the thematic category of impacts on young children, school and university students and adolescents, children with economic challenges, advisories of international organizations and the effects as a result of quarantine and separation from parents. Also, various recommendations were also stated in the article. The study stated the great need for more developmental and longitudinal studies as well as the importance of the use of evidence-based detailed plan of action in addressing the mental health and psycho-social needs of adolescents and children during and after the pandemic. The study also emphasized the need to enforce mental health policies that involve collaboration between various health practitioners such as psychologists, psychiatrists, pediatricians as well as community volunteers, this policy would lead to the improvement of children and adolescents' access to mental health support services thus enforcing the development of good coping mechanisms.

In the study of (Son et al., 2020) aimed to assess the effects of Covid_19 pandemic on the mental health of college students, interview surveys were used as the method of data collection. The

impact of the Covid_19 pandemic was assessed using a sample size of 195 students at a big public university in the United States. The study made use of qualitative and quantitative research methods. The results of the study showed that 138(71%) of the students expressed increased stress and anxiety as a result of the Covid_19 pandemic. Various stressors were discovered to be associated with the above results and they included: fear and worry regarding their health and that of their loved ones (177 of 195, 91% stated the negative effects of the pandemic), difficulty in concentrating (173 of 195, 89%), alteration in sleep patterns (168 of 195, 86%) and elevated concern about their academic performance (159 of 195, 82%). The study also identified various coping mechanisms of the students, this includes seeking support from other individuals, self-help through the use of either negative or positive coping strategies. It was thus concluded that as a result of the long length of the pandemic situation such as lockdown and social distancing through staying at home, the Covid_19 pandemic affects higher educations and universities negatively. The study thus expressed the great need in the development of preventive strategies and intervention in order to tackle the effects of the Covid_19 pandemic on the mental health of college students

In the study to access the impact of Covid_19 pandemic on the mental health of the general population by (Xiong et al., 2020) a systematic literature search was carried out using various search engines such as PubMed, Embase, Web of Science, Scopus and Medline, this made use of the PRISMA guidelines. The authors also made use of a manual search using Google Scholar in order to include more studies related to the research. The results of the study showed high prevalence of symptoms of anxiety (6.33% to 50.9%), post-traumatic stress disorder (7% to 53.8%), stress (8.1% to 81.9%), psychological distress (34.43% to 38%) and depression (14.6% to 48.3%) in the general population following the onset of Covid-19 pandemic in China, Iran, Spain, Italy, Turkey, the US, Denmark, and Nepal. The study also identified various risk factors associated with the high prevalence of psychological stress and these include: individuals 40 years of age and below, female population, unemployed individuals, individuals with chronic and/or psychological illnesses, high exposure to news outlets and social media with news related to Covid_19 pandemic and being a student. The authors identified a high degree of diversity across the studies, and this led to some limitations in their study. In conclusion, the Covid_19 pandemic has led to an increase in psychological stress which in a great number of cases is clinically relevant.

Thus, the global health priority should be to reduce the harmful effects of Covid_19 pandemic on the mental health of the public.

In the study of (Kaparounaki et al., 2020) aimed at assessing the university students mental health amidst the Covid_19 quarantine in Greece an online survey of the first one thousand university students who filled the questionnaire was done. Assessing the impact of the lockdown on their mental health was the primary goal of the study. The results of the study showed an increased score of 73.3% for depression, 63.3% increase in suicidal ideation and 42.5% on anxiety. The study also showed changes in the sleep pattern with an increased length(hour) of sleep (66.3%) but reduced quality of sleep (43.0%). Also, it was identified that the quality of life worsened in 57.0% of the studied sample, the presence of a 3-fold (25%) increases in possible diagnosis of depression, approximately 8 fold increase in suicidal ideation. The study also discovered that one-fifth of the studied sample are open to conspiracy theories related to Covid_19 where as one-third of the sample accept these theories. It is thus concluded that whereas the short-term impact of Covid_19 pandemic is clear, its long-term effect is not clear. Following the results of the study, there is therefore need for specified interventions on the mental health of the public, particularly the vulnerable population.

In the cross-sectional survey conducted by (X. Wang, Hegde, Son, Keller, Smith, & Sasangohar, 2020) to investigate the mental health of US college students during the Covid_19 pandemic, undergraduate and graduate students of the Texas A & M university was used as the study sample and contacted via email. The instrument for data collection was the questionnaire constructed using the General anxiety disorder-7-for depression and anxiety and the Patient Health Questionnaire-9. In all two thousand and thirty-one students were studied. The result showed that 48.14%(n=960) exhibited moderate to severe level of depression, 38.48%(n=775) exhibited moderate to severe level of anxiety and 18.04%(n=366) had suicidal ideation. The study also showed that more than half of the participants (n=1443, 71.26%) expressed an increased level of stress and/or anxiety as a result of the Covid_19 pandemic, while the rest of the population (n=882, 43.25%) stated that they were able to properly cope with the challenges related to the pandemic. In conclusion, the number of respondents with depression, anxiety and/or suicidal ideation is of great concern. Also, the respondents expressed concerns related to lifestyle, health and academic following the onset of the pandemic. It is thus of great importance to understand and tackle these concerns.

(Odriozola-González et al., 2020) in their study to analyze the psychological effects of the Covid_19 outbreak and lockdown among the students and workers of a Spanish university made use of a cross-sectional study which was designed using the Depression Anxiety Stress Scale (DASS-21) in order to assess the level of depression, stress and anxiety. The Impact of Event Scale was also used in the study in order to access the impact of the pandemic on the emotional wellbeing of the respondents. The number of participants in the survey were two thousand five hundred and thirty respondents from the University of Valladolid, Spain. The results showed moderate to extreme severity in the score of anxiety (21.34%), stress (28.14%) and depression (34.19%). Also, 50.43% of the respondent expressed moderate to severe impact of the pandemic. The study also showed a difference in scores of students from different fields of study, as students from the faculties of Law, Arts and Humanities and social sciences recorded higher score of depression, anxiety, impact of the pandemic and stress when compared with students from Engineering and Architecture. When compared with students, the staff of the university showed lower scores in all areas measured. The research was conducted during the first weeks of the Covid_19 lockdown. The authors concluded the research by emphasizing the need for careful monitoring of the mental wellbeing of students as this is a good step towards providing prompt mental health services and the development of adequate preventive measures.

In the study of (Zhang et al., 2020) aimed at assessing the mental health problems during the Covid_19 pandemic and the mitigation effects of exercise, a longitudinal study was conducted on college students in China. The research was conducted during the peak of the Covid_19 pandemic in China. A structured questionnaire was used as the instrument for data collection and was administered to 66 university students. The questionnaire obtained information ranging from the demographics of the respondents, their physical activity, presence of negative emotions, level of aggression and quality of sleep. Associations between variables were assessed using a mixed-effect model. The researchers also explored the mediating effects of quality of sleep. Results of the study showed that the mortality rate of Covid_19 directly affected the quality of sleep negatively (β =1.37, 95% confidence interval {95% CI}: 0.55, 2.19), there was also a reduced aggressiveness (β = -6.57, 95% CI: -12.78, -0.36). As opposed to the above results, the mortality rate associated with Covid_19 indirectly impacted the general negative emotions (indirect effect (IE)= 0.81, p=0.012), anxiety (IE= 0.27, p= 0.004), and stress (IE= 0.40, p < 0.001) with quality of sleep as a mediator. The result of the study also discovered direct relationship between the reduction of general

negative emotions and physical activity (β = -0.12, 95% CI: -0.22, -0.01), this effect was at its maximum when the weekly physical activity was about 2500METs. In conclusion, the extent of Covid_19 pandemic has an indirect effect on negative emotions by affecting the quality of sleep. Also, suitable amount of exercise and good sleeping pattern has the ability to generally improve the mental health of individuals.

In the study of (Cao et al., 2020) aimed at determining the psychological impacts of Covid_19 pandemic on college students in China, cluster sampling was used to determine the sampled population. The studied population was university students from Changzhi medical college. The instrument of data collections was a questionnaire which contained a seven-item generalized anxiety disorder scale (GAD-7) section as well as a demographic section. The respondents numbered seven thousand, one hundred and forty-three. Results of the study showed that 21.3% of the respondents expressed mild anxiety, 2.7% expressed moderate anxiety while 0.9% expressed severe anxiety. The study also discovered certain factors that protect individuals from development of anxiety and these include: stable family income (OR= 0.726, 95% CI= 0.645- 0.817), living with parents (OR =0.752, 95%CI = 0.596- 0.950) and living in urban areas (OR= 0.810, 95%CI =0.709- 0.925). The study also recorded an increased risk for developing anxiety of university students with relatives or friends infected with Covid_19 (OR = 3.007, 95% CI =2.377- 3.804). According to correlation analysis conducted in the study, impacts on daily life, postponement of academic activities and effects on economy showed a positive association with symptoms of anxiety (p< 0.001). On the other hand, the presence of social support was negatively correlated with the anxiety level (p < 0.001). In conclusion, the authors emphasized the need to monitor the mental health of university students.

In the study of (Huckins et al., 2020) to determine the mental health and behavior of college students during the early phases of the Covid_19 pandemic, a longitudinal smartphone and ecological momentary assessment was done. The research made use of self-reported data of university students who have been part of longitudinal study since two years and sort to answer the following questions: when compared to the previous data of two years, is there a change in the mental health of the respondents as an result of the Covid_19 pandemic?, also, if there are changes in the mental health and behaviors of respondents, are they influenced by the news or information of Covid_19?. The study made use of the Student Life smartphone sensing app which was installed

and used to assess the number of phones unlocked, duration of phone usage, quantity of sleep, number of locations visited, sedentary time and distance traveled (step count). Weekly self-report was done by the respondents and was used to assess the levels of anxiety and depression using the patient Health Questionnaire-4. In all 217 students responded, 178 (82.0%) of these students provided data during the Winter Semester of 2020. The result of the study showed increased level of anxiety and depression during the Winter Semester 2020 when compared to the previous semesters (first academic semester impacted by Covid_19 pandemic) (p <0.001) also during this period respondents were more sedentary. The result of the study also showed the number of locations visited and increase in phone usage were greatly associated with increase information and news related to Covid_19 pandemic, this was measured using mixed linear model. In conclusion, when compared with previous academic semesters, individuals in the Semester affected by Covid_19 (Winter Semester 2020) expressed increased level of anxiety and depression as well as more sedentary. Behavioral changes such as decreased physical activities, increased phone usage and fewer step count were associated with fluctuations in the news report of Covid_19. The characterization of these mental health and behavioral changes helps to guide the developments of interventions aimed at mitigating the impact of the pandemic.

In the study of (Elmer et al., 2020) comparing students social network and mental health before and during the Covid_19 pandemic in Switzerland, conducted in April 2020 using the longitudinal data available from 2018. The measures used to determine and analyze social networks include: social support, study partner(s), interaction and friendship while the measures used to assess mental health in the study include: level of anxiety, depression, loneliness and stress. Two groups of Swiss undergraduate students were used for the study, one experiencing the pandemic (N=212) and the second not experiencing the crisis (prior to the pandemic, N=54). When comparing the two groups, the result of the study showed a reduction in interaction and co-studying partner as evidenced by more students studying alone. Also, there was an increased level of loneliness, stress, anxiety, and depression in the group of students experiencing the pandemic as stress factors moved from fear of missing out on social activities to anxiety over health future, family, and friends. According to conducted exploratory analysis the specific concerns brought about by Covid_19 include lack of social interaction, isolation from social networks, emotional support and physical isolation led to mental health challenges. It was also seen that the female students had increased mental health challenges while controlling for levels of social interaction and Covid_19 related

stressors. The study also stated the importance of identifying students with increased risk of mental health challenges and offering social support to these individuals in order to mitigate the psychological effects of the Covid_19 pandemic.

In the study of (Lai et al., 2020) determining the mental health impact of Covid_19 pandemic on international university students, related stressors and coping strategies. The study compared the Covid_19 related stressors and mental health impact of the pandemic between the international students of UK and US universities who returned to their country of origin (returnees) and those who did not (stayed back in the study country {stayers}). In all 124 full-term international students were used for the study of which 36.3% are males, 75.8% returnees (international students who returned to their home country as a result of Covid_19 related reasons, 77.4% were bachelor's students and 53.2% studied in programs with practical components. The study made use of these two groups of international students to identify the Covid_19 related stressors of international students and also to identify various coping mechanisms that predicts mental health. The instrument of data collection was an online questionnaire which was distributed between 28[th]April to 12th May 2020. The sampling technique used for the study was the exponential, non-discriminative snowball technique which was registered at the National Institute of health (NCT04365361). The results of the study showed that 84.7% of the studied sample expressed moderate to high level of stress, 12.1% expressed moderate to severe symptoms of depression and anxiety and 17.7% expressed moderate to severe disruption of sleep pattern (insomnia). When compared to returnees, the stayers expressed noticeably higher level of stress as a result of Covid_19 related stressors, some of these stressors include lack of adequate social support and personal health anxiety (Cohen's d: 0.57-1.11). The stayers also expressed increased severe symptoms of insomnia (Insomnia Severity Index {ISI}) (11.8+/_ 5.2, β (95% CI): 3.087 (0.262, 5.912), Cohen's d: 0.45]. When compared with the male gender, the female gender expressed noticeably higher level of stress as a result of uncertainties of their educational program (Cohen's d:0.45) with a small effect size. According to the study, negative mental health impact of Covid_19 was predicted to be due to stress related to academics (such as uncertainties about the study program, change in learning and teaching technique and personal attainment), lack of adequate social support, health (both personal health and health of family and friends). The predictors of a less negative impact to mental health according to the study include positive thinking, exercise, and resilience. In conclusion, more negative mental health impact was expressed by stayers when

compared to returnees. It is thus important that teachers and mental health experts provide adequate support for all international students especially those who do not return to their home countries during the period of Covid_19 pandemic.

In the study of (Zhao & Zhou, 2020) aimed at investigating the associations of Covid_19 related social media use with mental health outcomes and uncovering the mechanisms between the links. The sample size for the study included 512 Chinese university students (62.5% females, medial age of 22.12 years, standard deviation of 2.47). The study took place between the 24th of March and 1st of April 2020 using an online questionnaire. The questionnaire was designed to measure the Covid_19 related stressors, social media use, secondary traumatic stress (STS), level of anxiety, negative effects, and level of depression. Regression analysis was done and produced the following results: a decrease in mental health was associated with increased social media use, also, increased level of depression was linked to increased exposure to social media news in respondents with high levels of disaster stressors. In conclusion, the study identified a risk factor (disaster stressor) which may increase the impact of social media use on level of depression. Also, excess viewing of social media news has the ability of triggering negative affect, this thus can lead to mental health challenges. More evidenced base interventions should be instituted to improve the mental health of the public, these interventions should include elements of negative affect and disaster stressor.

In the study of (Song et al., 2021) to determine the Covid_19 related traumatic effects and psychological reactions among international students, an online survey was administered to 261 Chinese international students in the United States. This survey obtained data on the demographics of the respondents, educational data, economic background, and health status of native Chinese students schooling in the United States. The mental health status of the respondents was measured by determining the level of stress, anxiety, and depression, also, the impact of Covid_19 on their mental health was determined using a Post-traumatic Stress Disorder checklist Civilian Version (PCL-C). Results of the study include: of the 261 respondents, 37.5% expressed moderate to severe on the PTSD PCL-C scores. Also, poor self-assessed health status and high economic pressure were linked to higher PTSD PCL-C score as well as higher level of stress, anxiety and depression. In conclusion, as a result of the Covid_19 pandemic, almost half of the respondents expressed moderate to severe level of anxiety, whereas one-third of them recorded moderate to severe PTSD

PCL-C score. The study also showed that increased psychological impact of Covid_19 and deteriorated mental health status was related to economic pressure, health status and future study plans. It is therefore important to address the mental health of international students during the Covid_19 pandemic.

In the study of resilience, support system and coping as mediators between Covid_19 related stressful experiences and acute stress disorder among college students in China (Ye et al., 2020). The population of study includes7,800 university students in China. An online survey was administered during the initial stage of the Covid_19 pandemic, that is from 31st January to 11th February 2020. The use of path analysis was done to examine the research hypothesis. Also, measurement of resilience, coping, stressful experiences, acute stress disorder (ASD) symptoms and social support was done using existing scales. The results of the study showed that out of the 7,800 respondents, 61.53% are females with mean age of 20.54 years. The results also showed noticeable acute stress disorder symptoms resulting from either direct or indirect stress conditions of Covid_19 pandemic. Also, resilience ($\beta = 0.01$, $p < .001$), well adaptive coping strategies ($\beta = 0.02$, $p < .001$) and social support system ($\beta = 0.01$, $p < .001$) plays an important role in reducing the acute stress disorder symptoms caused by the pandemic. It is thus concluded that ASD symptoms can be reduced by adequate coping strategies and good support system, thus determining the risk factors, and forming protective mechanisms can help reduce the impact of Covid_19 on the mental health.

In the study of (Xiao et al., 2020) to determine the impact of social distancing on the lives pf medical students in China, a cross- sectional survey of university students around the country was done from the 4th to the 12th of February 2020. The study was limited to medical students who study public health in Beijing and Wuhan. The study determined the knowledge of the respondents on Covid_19 as well as assessed the mental health status and coping mechanisms through the use of a questionnaire. The Health Questionnaire-9 and the patient Generalized Anxiety Disorder-7 were used to assess the level of anxiety and depression of respondents. Also, multivariant logistic regression analysis and path analysis were used to determine the relationship between anxiety/depression and covariates. The study generated the following results, out of the 933 student respondents, 96.2% (898) stated wearing face masks regularly when going out, 77.5% (723) stated washing their hands on a daily base with detergent, 72.5% (676) expressed washing their hands

once they returned home, 98.0% (914) stayed indoor as much as possible. Also, according to the results of the study 17.1% of the respondents reported having anxiety while 25.3% reported having depression. Multivariant logistic regression analysis revealed anxiety was related to graduate students' status (Odds ratio {OR}= 2.0; 95% confidence interval {CI}: 1.2-3.5), depressive feeling (OR=6.8; 95%CI: 4.0-11.7) and negative thoughts or actions (OR=1.6; 95%CI: 1.4-1.7). When comparing students in different universities, students in Wuhan (epicenter) had more anxiety than students in Beijing (OR=0.9; 95%CI: 0.8-1.0), however the there was no difference in the level of depression. More female students expressed feeling of depression (OR= 2.0; 95%CI: 1.2-3.3). The results from anxiety disorder (OR=5.8; 95%CI:3.4-9.9), and negative thoughts or actions (OR=1.7; 95%CI: 1.5-1.9). The results from the paths analysis predicted the same results. In conclusion, although medical students were informed about the control and prevention of disease, the impact of the social distancing and Covid_19 pandemic was still felt especially in the epicenter Wuhan. Thus, even students who are knowledgeable still require mental health support during challenging times.

In the study of (Ghandour et al., 2020) with the objective of assessing the prevalence and predictors of distress and insecurity among Birzeit University community during the Covid_19 pandemic and lockdown, an online survey which was concluded between March and April 2020. Standard distress and insecurity scale was used. The questionnaire was uploaded in the University portal and also distributed via email to increase accessibility to all university community: students and staff. The result of the study shows that 84% of the 1,851 respondents were undergraduates, 10% graduates while 6% were staff. The demographic of the respondents shows 62% female, age of the respondents range from 17 to 70 years with mean age 24+/-9.7. According to the study, the occurrence of moderate to high distress was 40% and that of insecurity was 48%. The multiple logistic regression analysis showed that females under the age of 35 years and those in lower economic class expressed noticeably higher level of insecurity and distress when compared to the other groups. Also, higher odds of distress were also seen in undergraduates and individuals living with someone who is at increased risk of infection with Covid_19 (OR=1.56, 95%CI {1.13-2.15}) and (OR=1.34, 95%CI {1.11-1.62}) respectively. Concerns about Covid_19 was related to higher odds of distress (OR=1.77, 95%CI {1.46-2.14}) and insecurity (OR = 4.3, 95%CI {3.53-5.23}). In conclusion, emphases were made by the authors on the need to focus on not only the physical well-being but also the mental well-being of individuals during the Covid_19 pandemic, more

focus should be allocated to women, young individuals, individuals who live with increased risk persons as well as individuals with lower income. The study also aims to increase awareness of the pubic and policy makers.

In the study of (Fountoulakis et al., 2020), establishing a collaboration concerning the mental health during the Covid_19 pandemic between the Aristotle University School of Medicine, the Panhellenic Medical Association and the World Psychiatric Association. The study consists of two large studies of various countries, the first one associated with the general population and the second one associated with university students. The results from the Greek students recorded two-thirds of the students expressed "much" increase in their level of anxiety during the lockdown, one -third recorded increment in the level of depression while 2.59% concerns suicidal ideation. The study also recorded decreased quality of life. 12.43% of the population recorded feeling depressed in addition to this percentage 13.46% recorded feeling severe distress. 20 to 68% of student population believed the conspiracy theory especially students from political science, law, literature, pedagogics. Other populations with increased belief to the conspiracy theory include the female population and the depressed population. According to the research the population from Greece experienced clinical depression (9.31%) during the lockdown in addition to this value 8.5% showed severe distress. Greater than 40% of the population expressed increased level of anxiety and depression.23.31% of individuals with previous history of depression, still experienced depression while 8.96% of those who experienced depression had no previous history. In contrast to some research, the study also identified that less conflicts and better relationship were related to higher level of anxiety and depressive symptoms, as well as increased incidence of suicidal ideation. The study also identified that coping mechanisms related to spiritual and religious aspect can protect them from suicidal ideation. Although finding correlation between variables does not necessarily mean causation, the study results suggest that conspiracy theories could be the cause of depression in some cases as well as the coping strategy against depression in other cased. In conclusion, more research is needed especially one involving international data.

In the study of (Dodd et al., 2021) exploring the psychological wellbeing of domestic and international university students during the Covid_19 pandemic, 787 students of Australian university students participated in the study. The method of data collection involved an online cross- sectional survey administered to students from 18 years of age and above. The results of the

study showed that 86.8% of respondents expressed notable impact of Covid_19 on their studies, in assessment of the wellbeing of participants 34.7% of respondents expressed sufficient level of wellbeing, 33.8% of respondents expressed low level of wellbeing and 31.5% of respondents expressed very low level of wellbeing. The level of wellbeing and anxiety was also different among students at different level of study: the wellbeing of postgraduate students was noticeably higher than the undergraduate students, also the level of anxiety was significantly lower among postgraduate students when compared to undergraduate students. The results from the multivariant regression model showed that the female population, decreased social status, poor overall learning experience and individuals who reported great impact of Covid_19 on their study were related to lower level of wellbeing in the early months of the pandemic (May to July). The study concludes by emphasizing the need for increased focus on the wellbeing, health and learning conditions of all students during and after the pandemic. Also, tailored interventions should be directed towards individuals with reduced social status, the female population in order to prevent extending of the differences noted in the study.

In the study of (Perz et al., 2020) which made use of the fear of Covid_19 scale (FCV-19S) (Ahorsu et al., 2020). The FCV-19S is a seven-point scale confirmed to have good psychometric assessment ability in studies with respondents from various countries. The method of data collection used for the study was a cross-sectional survey of US university students. In all 237 students participated in the study, the study sample were selected via convenient sampling. The FCV-19S is a valid scale with one-factor solution. Points on the FCV-19S with positive relationship with anxiety was seen in married students and Asian students. The FCV-19S has the ability to contribute to research and clinical practice in populations who have been impacted by Covid_19 pandemic as it (FCV-19S) was only moderately related with the Generalized Anxiety Disorder -7 Scale (GAD-7).

In the study of (Dhar et al., 2020) aimed at determining the impact of Covid_19 on the psychology of university students, the study involved various public and private universities in Bangladesh. The instrument for data collection was the questionnaire which was formed using the Generalized Anxiety Disorder-7 Scale (GAD-7). The study involved 15,543 participants and produced the following results: 44.59% of the respondents expressed having severe anxiety symptoms, 48.41% expressed moderate anxiety whereas only 3.82% expressed mild anxiety. According to the results of the research showed a positive relationship between the level of anxiety and the Covid_19

related stressors, stressors such as concern regarding the impact of Covid_19 on everyday activities (r=0.340, p <0.001) and concerns regarding the economic impact during and after Covid_19 pandemic (r= 0.342, p< 0.001) greatly impact on the level of anxiety expressed by the respondents. Also, stressors such as concern regarding availability of social support during the Covid_19 pandemic (r=0.321, p< 0.001) and concern regarding study delays as a result of Covid_19 pandemic (r=0.326, p< 0.001), have moderate impact on the level of anxiety. The study thus emphasizes the need for adequate support from the government and also regulated public knowledge during the Covid_19 pandemic in order to reduce the level of anxiety and promote good mental wellbeing for all students.

In the study of (Sun et al., 2021) aimed at investigating the psychiatric symptoms of traumatic stress, anxiety and depression during state-enforced quarantine among university students in China, a cross- sectional survey was conducted between March-April 2020. The study involved one thousand, nine hundred and twelve students. The results of the study are as follows: the psychiatric symptoms recorded was extremely high, 46.55% expressed having depressive symptoms, 67.05% of the respondents expressed traumatic stress and 34.73% expressed having anxiety symptoms. The results also showed that 19.56% of the respondents expressed having suicidal thoughts and ideas. The study also assessed various risk and protective factors to the psychological well-being of the respondents with the inclusion of demographic characteristics. The results found that the protective factors to psychological well-being include perceived availability of social support and mindfulness. The practice of mindfulness was linked to lower severity of symptoms. Also, factors related to the Covid_19 pandemic (such as Covid_19 prosocial behavior, perceived Covid_19 threats, perceived Covid_19 public stigma, Covid_19 financial stress and Covid_19 related efficacy) was linked to increased severity of symptom. The greater determinants to the outcome of psychological wellbeing were the interaction between Covid_19 public stigma and Covid_19 threat as the interaction between these factors led to increased severity of symptoms. The screen media use was positively related to depression. The results also showed that Covid_19 prosocial behavior and women was linked to increased anxiety whereas Covid_19 self-efficacy was associated with reduced anxiety symptoms. In conclusion, the result of the study expresses the high requirement of mental health and psychological wellbeing promotion among university students during and after the Covid_19 pandemic. Also, the negative impact of stigma during the pandemic should be greatly addressed from an ecological perspective. Multi-level and

state factors such as advocating the practice of mindfulness, reduction of public stigma, meeting the need of disadvantaged groups of individuals and those financially affected by the Covid_19 pandemic and improving the social support of individuals and between other individuals is a great step in the right direction.

In the study of (Wilczewski et al., 2021) aimed at exploring the psychological and academic effects of studying online from the home and host country during the coronavirus disease 2019 (Covid_19) pandemic, 357 international students from 62 countries enrolled at the university Warsaw, Poland included in the study. Among the 357 international students, 236 remained in the host country while 121 were in their home country. The instrument for data collection was an online survey administered two months after the shift to online method of teaching and learning. The parameters measured include: level of satisfaction in life and academic, level of loneliness, academic adjustment, loyalty, perception of online education experience and acculturative stress. The results of the study are as follows: The country of residence factor had statistically insignificant effect on majority of the psychological and academic variable. The significant effects were observed in two academic variables which are: students who returned to their home country expressed increased academic adjustments than students who remained in the host country as they found online communication with other students more contributing to their online educational experience. The above result reveals the positive influence of good support system of family and friends has on visual learning. The results also show a notable variation in the experience of acculturative stress in students who remained in the host country during the quarantine period. Thus, expanding existing research on the disruptive effects of social distancing on the mental health of students. The study also confirmed the predicted increase in the level of loneliness among self-isolating students in both countries. Finally, the result of the study showed no association between self-isolation and students' satisfaction in life and academics.

In the study of (Far Abid Hossain et al., 2020) aimed at assessing the socio-psychological impact of Covid-19 of Bangladeshi student during the Covid_19 pandemic, an online survey was used. The sampling technique used for the study is a simple random sampling. The generated sample was 474 respondents. The results of study showed various psychological concerns. Although the world health organization (WHO) stated that Bangladesh was one of the most dangerous places and is one of the 20 most affected countries in the world, the psychological impact of the Covid_19

pandemic in university students is not researched. The limitation of the study is the use of only a specific group of population and so this may affect the generalization of the results. In conclusion, the study expresses the need to establish and increase awareness in the impact of Covid_19 on the mental health of university students.

In the study of (Husky et al., 2021) titled prior depression predicts greater stress during theCovid_19 mandatory lockdown among college students in France, an online survey was completed by 291 students. The results of the study revealed that students who experience depression before the onset of the Covid_19 pandemic expressed more increment in the level of anxiety (72.2% vs 50.9%) and the level of stress (72.2% vs 49.4%) as well as more reduction in concentration (87.0% vs 72.9%) during the period of lockdown when compared to students with no previous episode of depression. The multivariant analysis shows that students with prior history of depression was related to financial stress (AOR= 1.95), overall stress (AOR= 5.50), stress from loved ones (AOE stress from work AOR= 5.15), and family stress (AOR= 2.47= 2.21). Also, previous depressive episodes were related with increased probability of experiencing higher anxiety (AOR- 2,.61) as well as stress (AOR = 2.55) during the period of lockdown. In conclusion, the study indicates that the best way to predict the occurrence of stress and anxiety during the first Covid_19 lockdown experience was the existence of previous episode of depression before the onset of the pandemic. Therefore, it is important that prior to the onset of a national lockdown, there should be the institution of public health measures to protect the mental health of the public, particularly those more vulnerable groups due to their history of mental challenges.

In the study (Agorastos et al., 2021) to express the need for holistic, longitudinal, and comparable, real-time assessment of the emotional, behavioral, and societal impact of the Covid_19 pandemic across the nations, the collaborative outcomes study on Health and Functioning during Infection Times (COH-FIT) was developed to fill the gap in literature. This study is the largest-scale known international collaborative study (over 200 researchers around the world, most set of multi-dimensional and multi-disciplinary data, In adults, adolescents an children, and with over 30 translations in different languages) because of it is easily assessable via the link www.coh-fit.com. The study is a cross sectional survey on an individual level a longitudinal survey on a population level. The longitudinal study started in April 2020 and continues until the world health organization declares the end of the pandemic. The technique for data collection is snow-balling

technique as well as nationally representative samples. The study assesses the health effects of the pandemic, it assesses a variety of behavioral and coping mechanism and functioning strategies between families, usage of social media- screen time, physical activities, religious practices, social interaction etc. it also assesses the changes in health care system functioning. The data is harmonized for better monitoring of the physical and mental effects via the monitoring of public health restrictions across countries. Though thousands of individuals have responded, more respondents are needed. This enhanced study design of COH-FIT and similar studies can help discover important factors and group of individuals who are at increased risk during the Covid_19 pandemic as well as suitable targets for short- and long-term preventive measures and interventions. Individual, community, societal, and governmental health preparedness can be developed by proper understanding of both the societal and health impact of the Covid_19 pandemic. It would also help to meet the needs of individuals, societal and systemic population via multi-level developmental guidelines and laws. This aims to promote the world's mental health outcomes.

2.4 Summary of Literature Review

Mental health is the basis for the well-being and proper functioning of individuals and involves more than the absence of a mental illness. The understanding of an individual's emotions and effective reaction to the emotions of other individuals as well as the ability to effectively reason and learn all constitute a healthy mental health (*Mental Health*, n.d.-a). The mental health of an individual at any point in time can be determined by various factors ranging from biological, social and psychological factors (*Mental Health*, n.d.-b). Mental health promotion deals with various activities aimed at enhancing the mental and psychological well-being of individuals. In most cases it involves the reinforcement and/or creation of suitable environment which supports development of healthy mental health. The development and implementation of mental health laws and policies should not only focus on the promotion, protection and enhancement of the mental health of the public but should also focus on the requirements of individuals already diagnosed with mental illness (*Mental Health*, n.d.-b). The Chain Mediation Model developed by (C. Wang et al., 2021) helped to simplify the explanation of the impact of Covid_19 on the mental health of individuals. Various scholarly work reviewed stated that stress, anxiety, and depression where the major mental health impact of Covid_19 on students as Covid_19 presented a challenge to the resilience of students. Majority/all literature available on related topic is based on an online-survey as a result of the nature of the infection, social- distancing and lockdown. Although various studies are available on the impacts of Covid_19 on the mental health of students as seen in the empirical review, few literatures review are available on summarizing these studies in order to give a clear picture on the impacts of Covid_19 on the mental health of university students. This study thus aims as bridging this gap in literature as the mental health needs of all students with the inclusion of international students should be enhanced and ensured.

CHAPTER THREE

METHODOLOGY

This chapter presents the method and procedures used in carrying out this research.

3.1 Research Method

A descriptive literature review was used for the study, this involved the review of relevant literatures related to the impacts of Covid_19 pandemic on the mental health of university students.

The literature review consists of the three major type: the conceptual review, the theoretical review and the empirical review of various literatures related to the research topic. Also, a summary of the literature was done.

Conceptual Review: In the conceptual review the concept of mental health and the concept of the coronavirus pandemic was discussed.

Theoretical Review: In the theoretical review the chain mediation model was discussed as well as its' application in the research.

Empirical Review: In the empirical review, the review of scholarly articles related to the impacts of Covid_19 pandemic on the mental health of university students was done as follows:

3.2 Sources of information and search tools

The primary source of information used for this study is the PubMed database and a well-structured and authentic google search in an attempt to obtain as much data as possible on the topic. The PubMed is a service of the United State National Library of Medicine that allows free access to MEDLINE (Medical Literature Analysis and Retrieval System Online or MEDLARS Online) data, abstracts to medically related articles and some selected life science journals (Shashikiran, 2016). Secondary sources of data used in this study was obtained from the references of the primary data source. For the primary data search the "Advance" icon was selected in order to refine the search. Based on the objectives of this research four major search categories were combined using "AND" in order to include studies containing all three terms: "Search (((((Impacts) OR (Effects)) AND (Covid_19)) AND (Mental health)) AND (Students). This search yielded a total of 444 items out of which 362 are free-source and accessible.

3.3 Inclusion and exclusion criteria for literatures used

Scientific studies related to the impacts of Covid_19 on the mental health of university students which use various study designs was the inclusion criteria whereas studies which did not meet the above criteria (was not related to the impacts of Covid_19 on the mental health of university students) were excluded from the study. The period to be used for the research include published articles starting from January 2020.

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│ "Search ((((Impacts) OR     │
│ (Effects)) AND              │
│ (Covid_19)) AND (Mental     │
│ health)) AND (Students)     │
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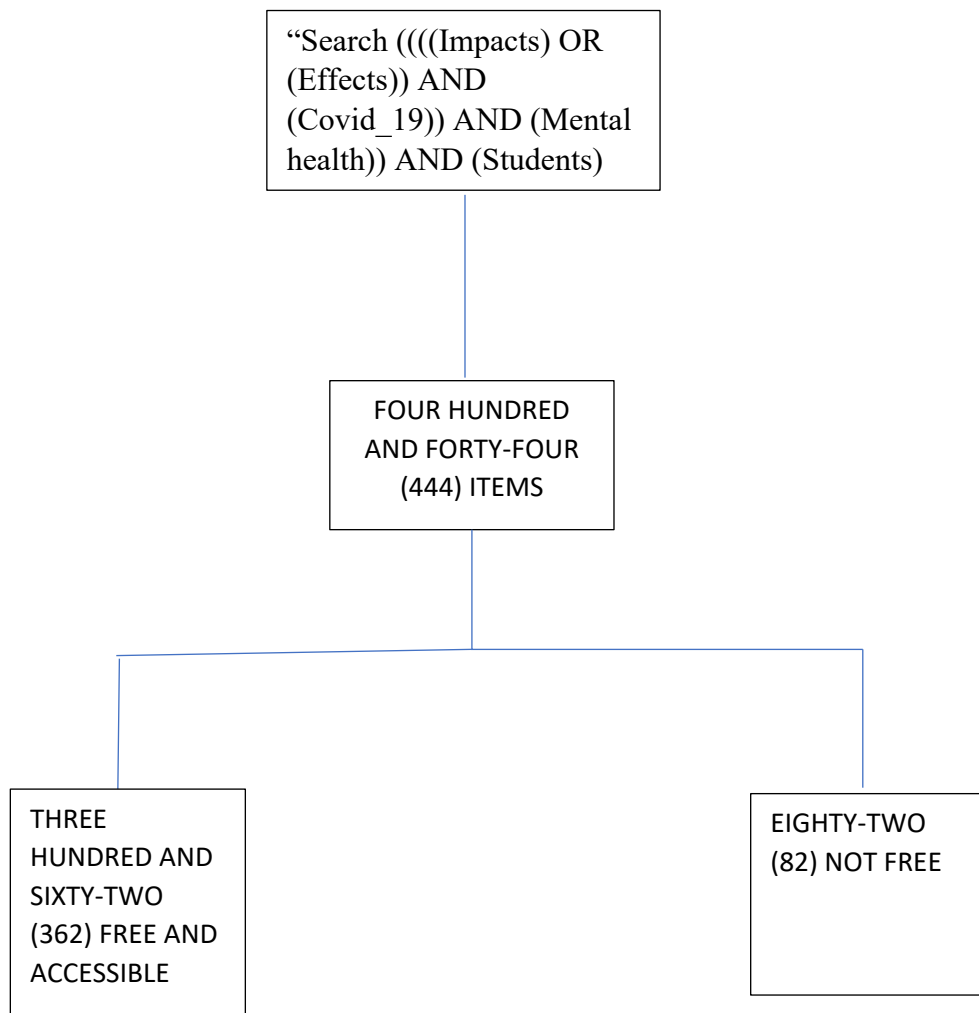
Fig 2: A summary of the literature search used for the study

CHAPTER FOUR

RESULTS OF THE STUDY

Table 1: A Summary of the Results of the Literature Review

Methodology used in the Reviewed Literatures	Research Instruments	The Impacts of Covid_19 Pandemic on the Mental Health of University Students:	Risk Factors Associated with an Increased Impact of Covid_19 Pandemic on the Mental Health of University Students:	Coping mechanisms Carried out by University Students to Mitigate and/or eliminate the Negative Impact of the Covid_19 Pandemic:	Recommendations to Mitigate and/or eliminate the Negative Impact of the Covid_19 Pandemic
online surveys in the form of online questionnaires	the Patient Health Questionnaire-9.	increased level of anxiety, stress, depression, post-traumatic stress disorder.	Various stressors such as: fear and worry regarding their health and that of their loved ones, difficulty in concentrating, alteration in sleep patterns and elevated concern about academic performance	coping mechanisms related to spiritual and religious aspect can protect them from suicidal ideation.	developmental and longitudinal studies, the use of evidence-based detailed plan of action. careful monitoring of the mental wellbeing of students
longitudinal smartphone and ecological momentary assessment	fear of Covid_19 scale (FCV-19S)	increased experience of suicidal ideation	university students with relatives or friends infected with Covid_19, impacts of Covid_19	suitable amount of exercise and good sleeping pattern which has the ability to generally improve the mental health of individuals	development of preventive strategies and intervention identification of vulnerable groups

RESULTS OF THE STUDY

Table 1: A Summary of the Results of the Literature Review

online interview	Standard distress and insecurity scale	poor changes in sleep pattern	lockdown and use of facemask, postponement of academic activities and effects on economy	resilience, well adaptive coping strategies and social support system plays important roles in reducing the acute stress disorder symptoms caused by the pandemic	global health priority that focuses on decreasing the harmful effects of Covid_19 pandemic on the mental health of the public.
the use of longitudinal data from researches conducted before, during and until the end of the Covid_19 pandemic	the Depression Anxiety Stress Scale (DASS-21)	impacted the quality of life	individuals 40 years of age and below, female population, unemployed individuals, individuals with chronic and/or psychological illnesses, high exposure to news outlets and social media with news related to Covid_19 pandemic and being a student	predictors of a less negative impact to mental health such as positive thinking, exercise, and resilience.	the development of specified interventions which will focus on the mental health of the public, particularly the vulnerable population.

RESULTS OF THE STUDY

Table 1: A Summary of the Results of the Literature Review

literature review	the Impact of Event Scale to access the impact of the pandemic on the emotional wellbeing of the respondents	a period fear and uncertainty	factors related to the Covid_19 pandemic (such as Covid_19 prosocial behavior, perceived Covid_19 threats, perceived Covid_19 public stigma, Covid_19 financial stress and Covid_19 related efficacy)	Protective factors such as living with parents and living in urban areas	Conducting more international studies on the impacts of Covid_19 pandemic on the mental health of university students in various countries
use of both qualitative and quantitative research methods	the General anxiety disorder-7-for depression and anxiety		Covid_19 public stigma and Covid_19 threat as the interaction between these factors led to increased severity of symptoms. Screen media use was positively related to depression	seeking support from other individuals, self-help and self-efficacy through the use of either positive coping strategies	Enforcement of mental health policies that involve collaboration between various health practitioners such as psychologists, psychiatrists, pediatricians as well as community volunteers
multivariant logistic regression analysis and path analysis			risk factor (disaster stressor) and excess viewing of social media news		adequate support from the government and also regulated public knowledge during the Covid_19 pandemic in order to reduce the level of anxiety and promote good mental wellbeing for all students, Elimination ofpublic stigma

CHAPTER FIVE

DISCUSSION OF RESULTS

5.1 Discussion

This chapter deals with the discussion of major findings of the study. The discussion was done based on the objectives of the study with the aim of summarizing the various findings of the reviewed literatures related to the impact of Covid_19 on the mental health of university students and provides better understanding of the results from these studies. This is arranged under the following headings: Methodology, Impacts of Covid_19 pandemic on the mental health of university students, Risk factors which causes and/or increases the impact of Covid_19 on the mental health of university students, coping mechanisms adapted by university students to deal with the impacts of Covid_19 and the recommendations.

This chapter also included the implication of this study to public health, study limitations, suggestion for further studies, recommendations, and conclusion.

5.1.1 Methodology used in the Reviewed Literatures: Majority of the study was conducted using the online survey research method due to the nature of the pandemic and the resultant lockdown. The overall methodology used was:

- online surveys in the form of online questionnaires (Zhang et al., 2020), (Kaparounaki et al., 2020), (Wang et al., 2020), (Odriozola-González et al., 2020), (Zhang et al., 2020), (Cao et al., 2020) , (Lai et al., 2020), (Zhao & Zhou, 2020), (Song et al., 2021), (Ye et al., 2020), (Xiao et al., 2020), (Ghandour et al., 2020), (Dodd et al., 2021), (Perz et al., 2020), (Dhar et al., 2020), (Sun et al., 2021), (Wilczewski et al., 2021), (Far Abid Hossain et al., 2020), (Husky et al., 2021), (Agorastos et al., 2021)
- longitudinal smartphone and ecological momentary assessment (Huckins et al., 2020)
- online interview (Son et al., 2020)
- the use of longitudinal data from researches conducted before, during and until the end of the Covid_19 pandemic (Elmer et al., 2020) (Agorastos et al., 2021)and
- literature review(Singh et al., 2020) .
- Very few research made use of both qualitative and quantitative research methods (Son et al., 2020). Also, few studies made use of the multivariant logistic regression analysis and

path analysis to determine the relationship between anxiety/depression and covariates (Xiao et al., 2020)

The use of these research methods (online) was done because of the nature of the Covid_19 pandemic and its spread. This is in line with the study of Hlatschwako et al. (Hlatshwako et al., 2021)

The database used was mainly the PubMed, Embase, Web of Science, Scopus and Medline, the use of the PRISMA guidelines and Google Scholar (Xiong et al., 2020). The instrument for data collection (questionnaire) was constructed using various standardized questionnaires such as:

- the General anxiety disorder-7-for depression and anxiety(Wang et al., 2020), (Cao et al., 2020), (Xiao et al., 2020), (Dhar et al., 2020)
- the Patient Health Questionnaire-9 (Wang et al., 2020), (Xiao et al., 2020)
- the Depression Anxiety Stress Scale (DASS-21) (Odriozola-González et al., 2020), the Impact of Event Scale to access the impact of the pandemic on the emotional wellbeing of the respondents (Odriozola-González et al., 2020),
- Standard distress and insecurity scale (Ghandour et al., 2020).
- fear of Covid_19 scale (FCV-19S) (Ahorsu et al., 2020)(Perz et al., 2020)

5.1.2 The Impacts of Covid_19 Pandemic on the Mental Health of University Students:

According to the literatures reviewed, the overall impacts of Covid_19 Pandemic on the mental health of university students are as follows:

About 99 % of the literatures reviewed showed a negative impact of Covid_19 pandemic on the mental health of university students. This was expressed in the form of increased level of anxiety, stress, depression, poor changes in sleep pattern, post-traumatic stress disorder, increased experience of suicidal ideation. This may be due to the fact that the Covid_19 pandemic brought a period fear and uncertainty especially during the onset of the pandemic where researchers were trying to obtain more information on the nature of the virus, its mode of spread as well as its treatment. This is in line with the study of (Elmer et al., 2020) who conducted an exploratory analysis to discover the specific concerns brought about by Covid_19. This included lack of social interaction, isolation from social networks and emotional support and physical isolation. This thus led to mental health challenges. (Elmer et al., 2020). Other explanation for the negative impact of

Covid_19 Pandemic on the mental health of university students can be due to behavioral changes such as reduced physical activities, increased phone usage and fewer step count as well as associations with fluctuations in the news report of Covid_19. (Huckins et al., 2020) . Also, negative mental health impact of Covid_19 was predicted to be due to stress related to academics (such as uncertainties about the study program, change in learning and teaching technique and personal attainment), lack of adequate social support, health (both personal health and health of family and friends). (Lai et al., 2020).

It was also discovered that increased social media use led to an increase in the level of anxiety, also, increased level of depression was linked to increased exposure to social media news and high levels of disaster stressors. (Zhao & Zhou, 2020).

Although majority of the literatures concluded a negative impact of Covid_19 Pandemic on the mental health of university students, a few studies also discovered students who coped well (Wang et al., 2020).

There was also a general consensus of an increased impact of Covid_19 pandemic on certain populations which were considered vulnerable in these studies such as individuals age 40 and below, women, individuals of lower socio-economic status, international students and students with a history of mental illness. There was also a general increase in mental health symptoms in individuals who have experienced symptoms of Covid_19 or whose relatives and friends are at higher risk of or has experienced symptoms of Covid_19. (Ghandour et al., 2020)

Some of the research confirmed that the Covid_19 pandemic affected university students irrespective of their field of study, In the study of (Xiao et al., 2020), although medical students were informed about the control and prevention of disease, the impact of the social distancing and Covid_19 pandemic was still felt especially in the epicenter Wuhan. Thus, even students who are knowledgeable still require mental health support during challenging times.(Xiao et al., 2020).

According to the (Dodd et al., 2021), the Covid_19 Pandemic affected the wellbeing of students in different ways, the wellbeing of postgraduate students was noticeably higher than the undergraduate students, also the level of anxiety was significantly lower among postgraduate students when compared to undergraduate students. (Dodd et al., 2021) This may be because the undergraduate student population usually falls within a younger age range when compared to the

postgraduate population and other staff of the university. (Ghandour et al., 2020) (Xiong et al., 2020)

The Covid_19 pandemic also led to negative impact on higher educations and universities. (Son et al., 2020) and also impacted the quality of life (Kaparounaki et al., 2020) (Fountoulakis et al., 2020).

In summary, the Covid_19 pandemic has affected the mental health of university students poorly and this may be due to the nature of the virus as well as the associated social restrictions to stop its spread.

5.1.3 Risk Factors Associated with an Increased Impact of Covid_19 Pandemic on the Mental Health of University Students:

According to the literatures reviewed in this study, the various risk factors associated with an increased impact f Covid_19 pandemic on the mental health of university students are as follows:

- Various stressors such as: fear and worry regarding their health and that of their loved ones, difficulty in concentrating, alteration in sleep patterns and elevated concern about academic performance (Son et al., 2020).
- university students with relatives or friends infected with Covid_19, impacts of Covid_19 pandemic on daily life such as lockdown and use of facemask, postponement of academic activities and effects on economy showed a positive association with symptoms of anxiety. (Cao et al., 2020)
- high prevalence of psychological stress was seen in individuals 40 years of age and below, female population, unemployed individuals, individuals with chronic and/or psychological illnesses, high exposure to news outlets and social media with news related to Covid_19 pandemic and being a student. (Xiong et al., 2020) (Sun et al., 2021)
- factors related to the Covid_19 pandemic (such as Covid_19 prosocial behavior, perceived Covid_19 threats, perceived Covid_19 public stigma, Covid_19 financial stress and Covid_19 related efficacy) was linked to increased severity of mental illness symptom. The greater determinants to the outcome of psychological wellbeing were the interaction between Covid_19 public stigma and Covid_19 threat as the interaction between these

factors led to increased severity of symptoms. Screen media use was positively related to depression. (Sun et al., 2021) (Sun et al., 2021)

- risk factor (disaster stressor) and excess viewing of social media news which has the ability of triggering negative affect and thus can lead to mental health challenges. (Zhao & Zhou, 2020).

5.1.4 Coping mechanisms Carried out by University Students to Mitigate and/or eliminate the Negative Impact of the Covid_19 Pandemic:

- seeking support from other individuals, self-help and self-efficacy through the use of either positive coping strategies(Son et al., 2020) (Sun et al., 2021)
- suitable amount of exercise and good sleeping pattern which has the ability to generally improve the mental health of individuals. (Zhang et al., 2020)
- coping mechanisms related to spiritual and religious aspect can protect them from suicidal ideation. (Fountoulakis et al., 2020)
- Protective factors such as living with parents and living in urban areas (Cao et al., 2020)
- predictors of a less negative impact to mental health such as positive thinking, exercise, and resilience. (Lai et al., 2020)
- resilience, well adaptive coping strategies and social support system plays important roles in reducing the acute stress disorder symptoms caused by the pandemic(Ye et al., 2020).

5.1.5 Recommendations to Mitigate and/or eliminate the Negative Impact of the Covid_19 Pandemic

According to the reviewed literatures, the overall recommendations offered include:

- developmental and longitudinal studies, the use of evidence-based detailed plan of action in addressing the mental health and psycho-social needs of adolescents and children during and after the pandemic (Singh et al., 2020).
- Enforcement of mental health policies that involve collaboration between various health practitioners such as psychologists, psychiatrists, pediatricians as well as community volunteers, this policy would lead to the improvement of children and adolescents' access to mental health support services thus enforcing the development of good coping mechanisms (Singh et al., 2020) (Zhao & Zhou, 2020)

- Conducting more international studies on the impacts of Covid_19 pandemic on the mental health of university students in various countries (Fountoulakis et al., 2020),

- development of preventive strategies and intervention in order to tackle the effects of the Covid_19 pandemic on the mental health of university students(Son et al., 2020)

- global health priority that focuses on decreasing the harmful effects of Covid_19 pandemic on the mental health of the public. (Xiong et al., 2020)

- the development of specified interventions which will focus on the mental health of the public, particularly the vulnerable population. (Kaparounaki et al., 2020)

- careful monitoring of the mental wellbeing of students as this is a good step towards providing prompt mental health services and the development of adequate preventive measures.(Odriozola-González et al., 2020)(Cao et al., 2020)

- the characterization of these mental health and behavioral changes as this would help to guide the developments of interventions aimed at mitigating the impact of the pandemic (Huckins et al., 2020)

- the identification of students with increased risk of mental health challenges and offering social support to these individuals in order to mitigate the psychological effects of the Covid_19 pandemic.(Elmer et al., 2020)

- teachers and mental health experts should provide adequate support for all international students especially those who do not return to their home countries during the period of Covid_19 pandemic. (Lai et al., 2020) (Song et al., 2021)

- protective mechanisms such as adequate coping strategies and good support system can help reduce the impact of Covid_19 on the mental health and thus should be enforced more in universities(Ye et al., 2020).

- focus should be made on not only the physical well-being but also the mental well-being of individuals during the Covid_19 pandemic, more focus should be allocated to women, young individuals, individuals who live with increased risk persons as well as individuals with lower income. This should be enforced by the policy makers (Ghandour et al., 2020) (Dodd et al., 2021)

- adequate support from the government and also regulated public knowledge during the Covid_19 pandemic in order to reduce the level of anxiety and promote good mental wellbeing for all students. (Dhar et al., 2020) (Far Abid Hossain et al., 2020)

- the negative impact of stigma during the pandemic should be greatly addressed from an ecological perspective. Multi-level and state factors such as advocating the practice of mindfulness, reduction of public stigma in all nationalities and continents, meeting the need of disadvantaged groups of individuals and those financially affected by the Covid_19 pandemic, improving the social support of individuals and between other individuals is a great step in the right direction. (Sun et al., 2021)

- there should be the institution of public health measures to protect the mental health of the public, particularly those more vulnerable groups due to their history of mental challenges.(Husky et al., 2021)

- community involvement, societal, and governmental health preparedness can be developed by proper understanding of both the societal and health impact of the Covid_19 pandemic and help to meet the needs of individuals, societal and systemic population via multi-level developmental guidelines and laws. This would promote the world's mental health outcomes. (Agorastos et al., 2021).

5.2 Implication of this study to public health

The result of this study shows that the mental health of university students has been affected by the Covid_19 pandemic. Based on this findings and other research findings, there is great need for increased public focus towards innovative ways of promoting the mental health of the public, particularly that of university student population and international students who may not have adequate social support system. The students union of every university should channel more resources toward providing adequate mental health support and consultations to these group of individuals during and even after the Covid_19 pandemic. This would go a long way towards enhancing mental rehabilitation and mental well-being.

5.3 Recommendations to Improve the Mental Health following the Covid_19 pandemic

1. More Covid_19 related research should be carried out: The conduction of more Covid_19 related research to determine its impact on mental health particularly prospective cohort studies. So far, majority of the available research on Covid_19 are cross-sectional studies, though useful, they only confirm association between a Covid_19 related risk factor and the psychological outcome. The conduction of more prospective/real-time cohort studies

will help to confirm Covid_19 related causative factors that impair mental well-being. Thus, providing more evidence-based prevention and/or treatment options (Beijing University of Chinese Medicine, Beijing, China et al., 2020).

2. The formulation of policies, guidelines and laws promoting mental rehabilitation in the post Covid_19 era: Following multiple evidence of the existence or onset of psychological challenges caused by Covid_19, it is important to develop well-planned, feasible and specific mental rehabilitation strategies post-Covid_19 era in order to promote public mental health. Though some strategies already exist such as the respiratory rehabilitation, more strategies should be formed for the promotion of mental health (Beijing University of Chinese Medicine, Beijing, China et al., 2020).

3. The reinforcement and/or establishment of generally assessable telephone hotline or platform geared towards the management of psychological challenges: Although this exists to some extent, more reinforcements is required in the use of visual mental health consultation, diagnosis, treatment and counseling(Beijing University of Chinese Medicine, Beijing, China et al., 2020). Reinforcement can be done through the employment of more mental health staff in order to reduce the waiting time between calls and to increase its accessibility both throughout Germany and other developing parts of the world.

4. The involvement of members of the public and every other health personnel's: The ability to achieve universal accessibility of mental health care in Germany and other developing parts of the world can be made possible through effective training of members of the public and other health care staff on early warning signs, diagnosis and treatment of mental health disorders (Beijing University of Chinese Medicine, Beijing, China et al., 2020). In other to prevent further psychological challenges caused by the Covid_19 pandemic, every member of the public including health staff should be educated, trained, and involved.

5.4 Suggestions for Further Studies

Other researchers may find these listed topics of interest for further research in other to improve evidence-based practice.

1. Prospective cohort study to determine the causative Covid_19 risk factors that led to poor mental health of the public as well as international students

2. Increased study on understanding the impacts of Covid_19 pandemic on the mental health of international students in other German states as well as other parts of the world.

3. Assessment of various coping mechanisms and strategies to improve the mental health of international students and the world at large.

4. The use of Dance Movement Therapy and other good therapies to promote and improve the mental health of all students as well as the public.

CHAPTER SIX
CONCLUSION

Mental health is an important aspect of students' health, as there is no complete health without mental health. Prior to the onset of the Covid_19 pandemic the mental health of university students has been faced with various challenges. The onset of the Covid_19 pandemic as well as the frequent lockdowns aimed at preventing its spread thus increases the mental stress faced by these group of individuals as discussed in the study. It is therefore important to increase public attention towards the improvement of the mental health of these group of individuals through conducting more studies in order to provide evidence-based coping strategies, provision and improvement of mental rehabilitation and increasing accessibility to mental health consultations, counselling and/or treatment as the mental health of theses group of individuals and that of the general public should be made priorities by the universities, government and all individuals.

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DECLARATION

I hereby declare that this dissertation titled **"The Impacts of Covid_19 pandemic on the mental health of University students: A literature review"** was written independently by me (Valentina Uzonna Okeke, 2425464) with the supervision of my two supervisors, Prof Dr Andre Klussmann and Dr Jennifer Uju Okonkwo. I have clearly and correctly cited all materials used in this dissertation.

Date: 31.08.2021

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