ANXIETY, STRESS, AND RELATED FACTORS IN PREGNANT WOMEN DURING THE COVID-19 PANDEMIC IN HOSPITAL UNIVERSITI SAINS MALAYSIA

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By

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Hospital USM - Hospital Universiti Sains Malaysia

HREC - Human Research Ethics Committee

MCO - Movement Control Order

WHO - World Health Organization

KEBIMBANGAN, TEKANAN, DAN FAKTOR YANG BERKAITAN DALAM KALANGAN WANITA YANG MENGANDUNG SEMASA PANDEMIK COVID-19 DI HOSPITAL UNIVERSITI SAINS MALAYSIA

ABSTRAK

Terdapat banyak faktor yang menyebabkan berlakunya kebimbangan dan tekanan. Oleh itu, kajian ini bertujuan untuk menilai tahap kebimbangan dan tahap tekanan serta faktor yang berkaitan di kalangan wanita hamil. Satu kajian keratan rentas telah dijalankan di klinik Obstetrik dan Ginekologi (O&G), di Hospital Universiti Sains Malaysia dari Januari 2022 hingga April 2022. Soal selidik yang ditadbir sendiri telah diedarkan yang melibatkan 207 responden, berumur antara 19-44 tahun dan memenuhi kriteria kemasukan telah dipilih secara rawak sebagai responden kajian ini. Kaedah persampelan pula menggunakan kaedah *simple random sampling* berdasarkan kriteria pengambilan sampel dan kriteria pengecualian sampel. Data dalam kajian ini dianalisa menggunakan versi *Statistical Package for Social Sciences* (SPSS) *version 26 software.* Kajian ini mendedahkan tahap kebimbangan bahawa wanita hamil adalah rendah 116(56%), sederhana 78(37.7%) dan tinggi 13(6.3%). Manakala, tahap tekanan adalah rendah 125(60.4%) dan sederhana 82 (39.6%).Keputusan menunjukkan bahawa wanita hamil yang bekerja, tahap pendidikan dan senaman fizikal dalam kajian ini tidak dikaitkan dengan tahap kebimbangan (p > 0.05). Manakala untuk status perkerjaan menunjukkan ketara dengan nilai p < 0.05. Keputusan menunjukkan tahap pendidikan dan senaman fizikal dalam kajian ini tidak dikaitkan dengan tahap tekanan (p> 0.05). Hasil kajian ini boleh digunakan bagi tujuan pembelajaran.Pendidikan kesihatan boleh diberikan secara langsung kepada wanita hamil setelah mendapat keizinan daripada mereka.

ANXIETY, STRESS, AND RELATED FACTORS IN PREGNANT WOMEN DURING THE COVID-19 PANDEMIC IN HOSPITAL UNIVERSITI SAINS MALAYSIA

ABSTRACT

Pregnant mothers with anxiety and stress are due to many factors. Thus, this study aims to assess the level of anxiety and stress level and their associated factors among pregnant women. A cross-sectional study was conducted in Obstetrics and Gynaecology (O&G) clinic in Hospital Universiti Sains Malaysia from January 2022 to April 2022. A self-administered questionnaire involving 207 respondents between 19-44 years old and who fulfilled the inclusion criteria were selected as the study's respondents. The sampling method uses simple random sampling methods based on sampling and sample exclusion criteria. The data in this study is analyzed using Statistical Package for Social Sciences (SPSS) version 26 software. This study revealed the level of anxiety that pregnant women were low anxiety 116(56%), mild anxiety 78(37.7%), and high anxiety 13(6.3%). Meanwhile, the stress level was low, 125(60.4%) and 82(39.6%) moderate stress. The result has shown that employment status, educational level, and physical exercise were not significantly associated with anxiety (p> 0.05). Meanwhile, employment status was significantly associated with stress levels. Also, this study's educational level and physical exercise were not significant, with a p-value >0.05. The result of this study may be used for learning purposes. Health education can be given directly to pregnant women after getting consent

CHAPTER 1

INTRODUCTION

1.1 Background of study

The present COVID-19 pandemic is considered a natural disaster with a worldwide health impact. It affects more than 257,086,348 million people globally, and more than 5,158,436 million people have died. Malaysia has recorded over two million, five hundred seventy-five thousand, eight hundred eighty-eight million confirmed cases of COVID-19 with a mortality case of twenty-nine thousand, nine hundred thirty-seven (Worldometer, 2021).

The Malaysian government implemented the Movement Control Order (MCO), which aims to break the COVID-19 transmission chain among the public. The MCO forbids mass gatherings, suspends international travel, and closes all academic and business facilities except those that offer vital services such as food, health, telecommunications, and transportation (Prime Minister's Office Malaysia, 2020).

In people's daily lives, restrictions associated with social distance that prohibit communication with families, friends, and others increase stress, anxiety, and depression among them (Mehta et al., 2020). Not to forget that the public also had to adjust to the new norm, which included wearing a face mask, social distancing, frequent hand washing, and avoiding massive gatherings (National Security Council of Malaysia, 2021).

Mental health problems resulting from the COVID-19 pandemic also afflict pregnant women (Farrell et al., 2020), one of the pandemic's most vulnerable groups (Thapa et al., 2020). During the MCO, healthcare delivery in Malaysia, including obstetric services, was also affected. Antenatal care providers were instructed to keep the number of appointments to a minimum to prevent clinic overcrowding. As a result, antenatal checkups were postponed, putting pregnant women with complicated pregnancies at risk (Prime Minister's Office Malaysia, 2020).

Anxiety and depression can adversely affect pregnant women and result in poor neonatal outcomes. Pregnancy-related physiological changes can also cause psychological issues and disrupt women's socio-familial responsibilities. As a result of these changes, the mother may experience emotional instability and a variety of topics such as stress and anxiety (Ebadi et al., 2017).

Furthermore, mental wellness is essential for maternal and fetal development (Khatri et al., 2019). It was found that there is a correlation between pregnancy worry and anxiety among pregnant women. (Sines et al., 2019). Therefore, the study analyzed stress and anxiety in pregnant women during the COVID-19 pandemic (Zilver et al., 2021). In addition, it is reported that pregnant women are anxious to visit labor and delivery wards during the pandemic (Mappa et al., 2020) and are even delaying or canceling antenatal visits (Ding et al., 2021).

Consequently, anxiousness associated with devastating events or natural disasters can affect pregnant women's mental health (Feduniw et al., 2020). According to a study, fast-moving global health crises, such as COVID-19, have increased stress and anxiety among pregnant women (Li et al., 2020). Corbett et al., 2020 found that the present COVID-19 pandemic has increased anxiety among pregnant women.

Pregnant women are frequently worried about their unborn child's condition and the outcome of childbirth. Aside from pregnancy-related anxiety, many other risk factors have been associated with a high anxiety prevalence (Bayrampour et al., 2015). As a result, COVID-19 anxiety might be considered a factor in mental health (Corbett et al., 2020).

Pregnant women encounter additional obstacles due to their responsibilities towards their children and family members. On the other hand, receiving regular maternity services raises the risk of virus infection among this vulnerable group (Hussein, 2020). Medical visits and routine follow-ups were limited to emergencies and severe cases only during the lockdown.

Pregnant women may have experienced anxiety due to their fetus's inability to follow up regularly, and their overall mental health may have been impaired (Breslin et al., 2020). With a high-stress level of preparing for delivery and the anxiety of COVID-19 infection to the baby and themselves, pregnant women are at a higher risk of moderate to severe anxiety (Regehr et al., 2021).

Due to the above concerns, this study investigates the consequences of psychological conditions' outcomes during this pandemic COVID-19 in pregnant women in Hospital USM Kelantan. Thus, this study aimed to determine anxiety, stress, and related factors in pregnant women during the COVID-19 pandemic in Hospital USM Kelantan.

1.2 Problem statement

The Coronavirus 2019 disease (COVID-19) pandemic is a public health crisis forcing the governments to create required steps to protect their people's health (Wilder et al., 2020). During a pandemic, public health professionals must convey their health messages to those vulnerable groups (Centers for Disease Control and Prevention, 2021).

Pregnant women are classified as vulnerable due to unknown risks to their health and the fetus, treatment restrictions related to pregnancy, and limitations on the number of prenatal hospital visits (Dunkel et al., 2012). Pregnancy is one of the life periods with a high frequency of stress and anxiety disorders. The general level of stress and anxiety in the population of gravidae has increased since the pandemic began (Ayaz et al., 2020).

The coronavirus pandemic causes stress and anxiety among pregnant women in different parts of the world (Salehi et al., 2020). Many previous studies have reported a higher incidence of anxiety among pregnant women during the ongoing COVID-19 pandemic, with a prevalence rate of 30% for severe depressive and anxiety symptoms (Wu et al., 2020).

Significance can impair the emotional relationship between the mother and her fetus and increase the risk of adverse neonatal outcomes, such as intrauterine growth retardation, preterm birth, and low birth weight (Grote et al., 2010). Psychological effects such as anxiety and stress will affect infant care (Biagg et al., 2016) and result in the child's cognitive and emotional problems (Satyanarayana et al., 2011).

Various research suggests that prenatal stress may have long-term effects on gestational time and fetal growth and may even be responsible for behavioral and cognitive changes (Ravid et al., 2018). COVID-19 in pregnancy has become today's great concern which needs to be identified and taken care of to prevent major complications in the future.

In these challenging times associated with COVID–19, when there are several social and environmental disruptions, pregnant women might feel further anxious and worry about their pregnancy, health, and fetus (Hossain et al., 2020). Thus, this study aimed to identify anxiety, stress, and related factors in pregnant women during the COVID-19 pandemic in Hospital USM Kelantan.

1.3 Research question

Guiding the research study and to inform the research, the following research questions were formulated:

i.   What is the level of anxiety in pregnant women during the COVID-19 pandemic in Hospital USM Kelantan?

ii. What is the stress level in pregnant women during the COVID-19 pandemic in Hospital USM Kelantan?

iii. Is there any association between related factors (employment status, educational level, physical exercise) to anxiety in pregnant women during the COVID-19 pandemic in Hospital USM Kelantan?

iv. Is there any association between related factors (employment status, educational level, physical exercise) to stress in pregnant women during the COVID-19 pandemic in Hospital USM Kelantan?

1.4 Research objective

1.4.1 General Objectives :

This study aimed to determine the level of anxiety, stress level, and related factors in pregnant women during the COVID-19 pandemic in Hospital USM Kelantan.

1.4.2 Specific Objectives :

i. To determine the level of anxiety in pregnant women during the COVID-19 pandemic in Hospital USM Kelantan.

ii. To determine the stress level in pregnant women during the COVID-19 pandemic in Hospital USM Kelantan.

iii. To determine the association between related factors (employment status, educational level, physical exercise) of anxiety in pregnant women during the COVID-19 pandemic in Hospital USM Kelantan.

iv. To determine the association between related factors (employment status, educational level, physical exercise) of stress in pregnant women during the COVID-19 pandemic in Hospital USM Kelantan.

1.5 Research hypothesis

The research hypotheses for this study are presented as follows:

HO1: There is no significant association between related factors (employment status, educational level, physical exercise) to anxiety in pregnant women during the COVID-19 pandemic in Hospital USM Kelantan.

HA1: There is a significant association between related factors (employment status, educational level, physical exercise) to anxiety in pregnant women during the COVID-19 pandemic in Hospital USM Kelantan.

H02: There is no significant association between related factors (employment status, educational level, physical exercise) to stress in pregnant women during the COVID-19 pandemic in Hospital USM Kelantan.

HA2: There is a significant association between related factors (employment status, educational level, physical exercise) to stress in pregnant women during the COVID-19 pandemic in Hospital USM Kelantan.

1.6 Conceptual and operational definition

Table 1.1 Definitions for the operational terms

TERMS	OPERATIONAL	CONCEPTUAL
Anxiety	An uncomfortable feeling of nervousness or worry about something happening or might happen in the future. (Cambridge University Press, 2021).	The feeling of worry toward COVID-19 among pregnant women in Hospital USM.
Stress	The great worry is caused by a challenging situation or something that causes this condition. (Cambridge University Press, 2021).	Stress can be defined as any change that causes physical, emotional, or psychological strain. Stress is your body's response to anything that requires attention or action. (Elizabeth, 2020).

Pandemic	A pandemic disease is an epidemic that has spread over a large area. It's "prevalent throughout an entire country, continent, or world." (Dictionary. Com,2021).	A disease outbreak that spreads across countries or continents. It affects more people and takes more lives than an epidemic. (Jennifer Robinson, MD,2020).
Covid-19	Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. (WHO,2021).	Coronaviruses (CoV) are a large family of viruses that cause illnesses ranging from the common cold to severe diseases. A novel coronavirus (nCoV) is a new strain that has not been previously identified in humans.
Pregnant Women	A woman and some female animals have a baby or babies developing inside the womb. (Cambridge University Press, 2021).	It contains a developing embryo, fetus, or unborn offspring within the body of a pregnant woman (Merriam Webster, 2020).

1.7 Significance of study

Malaysia has recorded 70 cases of maternal deaths due to COVID-19 since the pandemic began, says the Health Ministry on Wednesday (Aug 11) (The Star, 2020).

Malaysia has reported 144 COVID-19 deaths among pregnant women since September 14 (CodeBlue, 2021).

A cross-sectional study was implemented due to the lack of literature on the factors contributing to the emotional and psychological impact (level of anxiety and stress) of the initial stages of the COVID-19 health emergency in Malaysia.I hope my study can contribute to the community, especially to the vulnerable group such as pregnant women, because the mothers' mental health is crucial during this pandemic. It will be a guide for prevention in the future.

The significance of this study is that it will bring us data regarding the anxiety, stress level, and related factors that affect pregnant women during this pandemic COVID-19. This study is important to discuss because, during this pandemic, pregnant women have limitations in seeing the healthcare workers seeking advice regarding their health outcomes and fetus development. Hence, it is critical to identify the mental health of pregnant women during their hard times at home during this pandemic COVID-19 because prevention is the most important.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter will represent the literature review regarding anxiety, stress, and related factors such as employment status, educational level, and physical exercise in pregnant women during this pandemic COVID-19. The description of the theoretical framework chosen will be presented in this chapter.

2.2 Concept of COVID-19

Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. Most infected individuals may only experience mild to moderate respiratory symptoms and will recover without the need for further treatment. However, some people may develop severe illnesses and need a physician. Serious illness is more likely to infect older adults and those with underlying medical conditions, including cancer, diabetes, cardiovascular disease, or chronic respiratory diseases. COVID-19 can cause anyone to become very ill or die at any age (WHO,2021).

On December 31, 2019, it was first reported to the WHO. The WHO declared the COVID-19 outbreak a global health emergency on January 30, 2020. It was first discovered in Wuhan City, Hubei Province, China, after an episode of respiratory illness (Cennimo, 2022). When an infected person coughs, sneezes speaks, sings, or breathes; the virus can spread from their mouth or nose through a small liquid particle. These particles range from larger respiratory droplets to smaller aerosols. It is important to practice correct respiratory techniques, such as coughing into a flexed elbow, isolating at home, and resting until you feel better (WHO,2021).

During the outbreak, the level of anxiety and stress level among people increased. However, the vulnerable group, pregnant women, may also be affected by COVID-19 in this study. This study will focus more on the level of anxiety, stress, and related factors (employment status, educational level, physical exercise) among pregnant women during the COVID-19 pandemic in Hospital USM.

2.3 COVID-19 Anxiety

Coronavirus is a severe pathogen that mainly affects the respiratory system of humans. Previous Coronavirus (CoV) outbreaks include the severe acute respiratory syndrome (SARS)-CoV and the Middle East Respiratory Syndrome (MERS)-CoV. These diseases have been recognized as serious public health threats (Rothan & Byrareddy, 2020).

The World Health Organization gave Coronavirus disease 2019 (COVID-19). It has been officially declared a pandemic because of its widespread infectiousness and high contagion rate, which often causes respiratory and enteric diseases in humans (Liu et al., 2020).

Anxiety is mild to severe unease, worry, or fear (Shrestha et al., 2021). During the COVID-19 outbreak, we discovered that pregnant women's anxiety level was extremely high (Sahin & Ozturk, 2021). According to a study by Corbett et al., 2020, most pregnant women, 83.1%, were not concerned about their health status before the COVID-19 pandemic, but 50% - 70% were worried about their health status during the pandemic (Costa et al., 2020).

In the previous study, the general level of anxiety has likely risen in the pregnant population due to the COVID-19 pandemic. Mainly in the patients that suffered from COVID-19infection during pregnancy, the prevalence of the anxiety spectrum was higher than in the non-infected group (Nowacka et al., 2021). Pregnant women are generally prone to anxiety duringthis challenging transition period. One of the most extensive systematic reviews and

meta-analyses, involving 102 studies and 221,974 women in the perinatal period, found clinical anxiety prevalence at 15.2% (Dennis et al., 2017).

During the COVID-19 pandemic, pregnant women in Japan expressed anxiety regarding the infection. The sources of anxiety changed over time; infection-related anxiety increased during the early phase of rapid pandemic growth, while anxiety about social support and mood disorders increased with the extending period of self-isolation (Shirabe et al., 2021). During the outbreak, the prevalence of anxiety among pregnant women increased the number of cases and deaths (Wu et al., 2020).

A study found that pregnant women were afraid to go to the hospital during the COVID-19 outbreak because they were concerned that if they did, the virus might infect them and their babies, so they contacted their doctors for help and wanted to give birth at home. In addition, pregnant women with at least one family member who tested positive for COVID-19 had higher anxiety levels than others (Sahin et al., 2021).

Anxiety causes in pregnant women may include feelings of vulnerability, loss of control, and concerns about non-isolation (National Institute for Health and Care Excellence, 2014). COVID-19 may be transmitted from person to person, associated with high morbidity and potentially fatal, and can intensify the personal perception of danger (Xiang, 2020).

According to previous studies, many pregnant women were anxious about using public transportation and infection among family members during the COVID-19 pandemic (Corbett et al., 2020). Hence, pregnant women are at a higher risk for COVID-19 virus-like all viral infections than non-pregnant women (Dashraath et al., 2020).

2.4 Covid-19 Stress

Stress is a state of mental or emotional strain or tension from unpleasant situations (Oxford University Press, 2018). However, stress can also be described in a medical or biological context as a physical, mental, or emotional factor that generates physiological or mental tension. Stress can be external (from the environment, psychological, or social events) or internal (from within one's own body) and (illness or a medical procedure). The "fight or flight" response, a complicated reaction involving neurological and endocrine systems, can be triggered by stress (Shiel, 2018).

According to a study, unique groups of people are under a great deal of stress in which women have been found consistently to have more significant stress levels in many research. During this pandemic, it's almost sure that women confront many additional stressors, suchas work, looking for others in the household, arranging for household items and supplies, and scheduling school and education for children (Maarefvand et al., 2020).

Their routines have been drastically altered and badly disrupted, resulting in increased stress (Maarefvand et al., 2020). A study in China also found that women reported more significant psychosocial distress than men (Qiu et al., 2020). According to a study, pregnant women experienced a higher level of depression and stress during the COVID-19 pandemic (Medina et al., 2020).

Because pregnant women are more susceptible to distress, pregnant women are thought to be at high risk for the pandemic's severe impacts. Pregnant women may experience stress during pregnancy, which may be associated with the potential for poor neonatal outcomes such as infant death or abnormalities. During an infectious disease outbreak, stress among pregnant women may rise (Saccone et al., 2020).

According to research, pandemic-related stress is associated with the development of anxiety, symptoms of depression, and obsessive-compulsive symptoms. These associations are partially mediated by more of the stress that pregnant women commonly experience, including stress related to their concerns about their health and changes in their bodies about the upcoming delivery. They will face the challenges as parents of a newborn child (Colli et al., 2021).

Due to the pandemic COVID-19, stress can also be caused by a lack of social and emotional support or family conflicts that adversely impact pregnant women and new mothers (Chiver et al., 2020). Our study showed that COVID–19 pandemic was an essential source of stress. Most mothers felt worried and frustrated due to COVID–19 and touched a high orvery high stress level (Mehdizadehkashi et al., 2021).

Preventing maternal distress will thus improve the well-being and health of both the mother and the baby. Preventive interventions ranged from (online) mindfulness-based self-help to multi-group sessions based on principles of well-established therapeutic procedures like Cognitive-behavioral therapy (problem resolution and communication skills) and interpersonal psychotherapy (underlining the importance of social relationships). Most treatments were mainly focused on pregnant women and included postnatal distress psycho-education, relaxation techniques, and the acquisition of emotion management skills (Missler et al., 2021).

2.5 Related factors of stress

The COVID-19 pandemic has caused a worldwide disaster and caused changes in a variety of areas. Due to the pandemic, physical and social isolation measures have been implemented, changes in daily routines, fears of financial loss, insecurity in food access, concern about the future, and many other possible stressors (Esterwood & Saeed, 2020).

Age between 18 and 20 years, female gender, living abroad, having a history of anxiety and depression, lesser leisure activity exercise, increased medication use, and compliance with isolating social measures were all found to be risk factors associated with clinical signs and symptoms of severe/extreme stress in a previous study (Souza et al., 2021).

On the other hand, working from home and using the Internet during leisure time have been stress factors (Souza et al., 2021). Prenatal stress is influenced by various other factors, including social support and life events (Biaggi et al., 2016).

Studies have also shown that higher distress among pregnant women can be due to various factors, including the danger of perinatal infection, being unprepared for delivery, and requiring a better supportive family (Chivers et al., 2020). Furthermore, as the period of self-isolation gets longer, pregnant women frequently post about mental issues and lack social support on social media. Minimal contact with health care providers and the lack of routine nursing care during the outbreak contributes to social isolation (Dodgson et al., 2010).

Findings show that pregnant women in Japan experienced stress about infection in the early stages of the COVID-19 pandemic. However, over time, they increasingly experience mood disorders and distress due to the lack of social support (Shirabe et al., 2021). For example, obstetric (pre-eclampsia, history of postpartum hemorrhage, fetal complications, and hyperemesis gravidarum), psychiatric (perinatal and antenatal psychiatric history, traumatic

life events, and fear of childbirth), social (lack of antenatal social support), and hormonal (low estradiol levels) can be related factors in which pose a risk in PTSD during pregnancy (Cirino, & Knapp, 2019).

Pregnant women with mood disorders are more likely to develop post-traumatic stress disorder, resulting in ectopic pregnancy, abortion, hyperemesis gravidarum, preterm birth, low birth weight, and Intrauterine Growth Retardation (IUGR) toward the fetus (Cook et al., 2018). Hence, providing prenatal care is part of infection control methods. Our findings suggest that healthcare practitioners should continue monitoring pregnant women's psychological distress during this extended period (Shirabe et al., 2021).

2.4 Factors related to anxiety

They were being female, brown-skinned, having a limited capacity to work from home, living in the North region of the country, having no more than 1–6 rooms within the household, having a history of anxiety and depression, having a chronic disease, and having reduced leisure activity exercise. Other than that, increasing medication use and complying with social isolating measures or quarantine were risk factors for severe/extreme anxiety. Protection against severe/extreme anxiety increased with age, especially among 45 to 83 (Souza et al., 2021).

According to Biaggi et al., 2016 risk factors for anxiety and depression in women are of younger ages, having low education achievements, poor working conditions, unemployment, low income, financial hardships, belonging to a minority ethnic group, and childhood maltreatment are risk factors for anxiety and depression. Other factors, such as social support and life events, also affect women in anxiety, especially pregnant women.

Furthermore, the risk of psychological abnormality has been higher in pregnant women with less than high school education. These findings suggest that education contributes to anxiety and depression during pregnancy. Pregnant women with low levels of education are at a higher risk of experiencing anxiety and depressive symptoms. (Kahyaoglu & Kucukkaya, 2021).

The current study found that pregnant women not working during the pandemic have a higher risk of anxiety and worry. During a pandemic, being unemployed or a housewife increases time spent at home and lowers interaction and interpersonal communication, raising the risk of anxiety and depression (Kahyaoglu et al., 2021).

During the COVID19 pandemic in the United States, it was discovered that face-to-

face prenatal consultation is the most important element that raises anxiety in pregnant women (Moyer et al., 2020). In India, the most common concern reported by pregnant women to obstetricians is visiting the hospital for prenatal check-ups and ultrasound scans (Nanjundaswamy et al., 2020).

According to the findings of this study, regular physical exercise is an essential factor in developing anxiety and depression during pregnancy. Anxiety and depression are more common among pregnant women who do not engage in regular physical activity. (Kahyaoglu et al.,2021).

According to Nanjundaswamy et al., 2020, roughly 35% of pregnant women in India are concerned about their jobs. Unemployment and prenatal anxiety in pregnant women have been associated with a strong positive relationship (Ma et al., 2019). Furthermore, being a stay-at-home mom and being unemployed throughout pregnancy has been involved in the development of anxiety and worry (Tang et al., 2019).

2.5 Conceptual framework of the study

Although there is growing recognition of the need to investigate the mental health impact of the COVID-19 pandemic (Gruber et al., 2020; Reger et al., 2020), little empirical work has demonstrated how COVID-19 experience, including probable diagnosis, confirmed diagnosis, knowing someone with a diagnosis, and knowing someone who died from COVID-19, may impact mental health in different ways (Gallagher et al., 2020). This data gap is regrettable because research suggests that being diagnosed with a significant medical illness like COVID-19 is linked to poor mental health (Moos & Schaefer 1984; Turner & Baker 2010).

COVID-19 is also likely to cause significant familial and caregiver stress, given that a considerable number of COVID-19 patients require hospital-level care (Hickman & Douglas, 2010). Furthermore, grief caused by the death of a loved one due to COVID-19 is likely to significantly influence mental and physical health worldwide (Ott, 2003). Understanding how COVID-19 experiences differ in mental health has an execution model for treatment and prevention (Cohen et al., 1983; Lee,2012).

In addition to COVID-19 experiences, COVID-19-related perceived stress is expected to influence the rise of poorer mental health outcomes significantly. Perceived stress reflects how unpredictable, uncontrollable, and burdensome one's life is (Cohen et al., 1983; Lee, 2012). Stress perception has been linked to adverse mental and physical health outcomes, such as anxiety (Lee, 2012; Redmond et al., 2013).

 Given the current pandemic's uncertainty, loss of control, and increased responsibilities to provide daily child care due to school closures, COVID-19-specific perceived stress should be crucial to investigate in the context of mental and physical health outcomes (Gallagher et al., 2020).

Theoretically, while the experience of COVID-19 (being diagnosed or knowing

someone who had it/died from it) is likely to cause severe stress, persistent COVID-19-related stress may worsen these mental health disorders (Gallagher et al., 2020). This view is consistent with the allostatic load model, suggesting chronic stress (McEwen, 2005).

COVID-19-specific perceived stress and anxiety were studied in the current study. We expected that people who thought they had COVID-19, had COVID-19 confirmed by a doctor, knew someone who had COVID-19, or knew someone who died from COVID-19 would likely have poor mental health outcomes (Gallagher et al., 2020).

We also looked into the relationship between anxiety and COVID-19-related subjective stress. The previous study hypothesized that higher COVID-19 perceived stress would lead to worse mental health in all mental health indices (Gallagher et al., 2020).
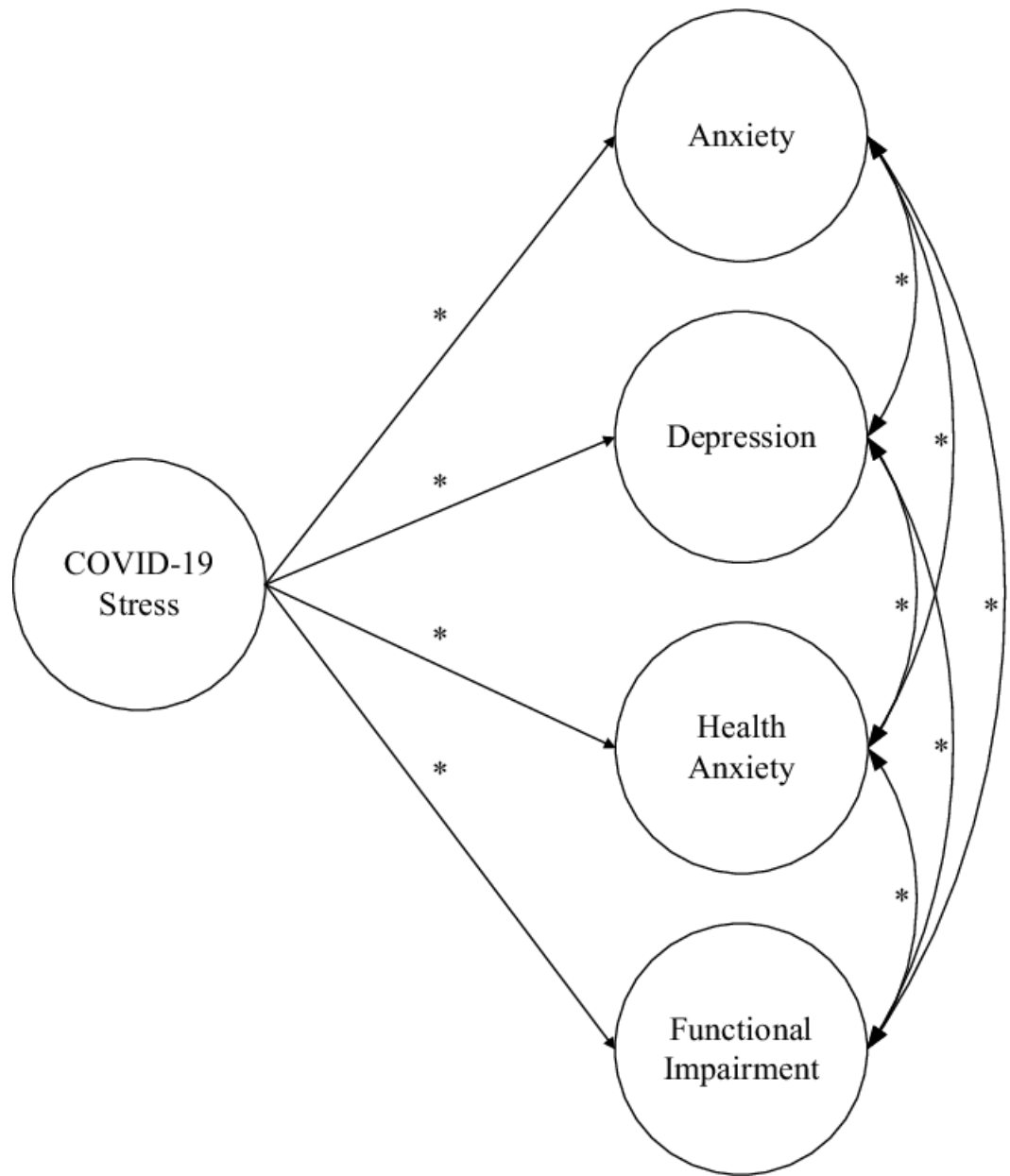
Figure 2.1 Structural equation model examining the effects of COVID-19 perceived stress on

anxiety, depression, health anxiety, and functional impairment (Gallagher et al., 2020).

The need for health information and the implications of the pandemic were shown to be subsequent mediators between physical symptoms similar to COVID-19 infection (predictor) and following mental health status (outcome) in the chain mediation model (Wang et al., 2021).

Excessive and inconsistent health information could increase the pandemic's impact. Rapid COVID-19 testing should be performed to reduce the psychological burden associated with physical symptoms, whereas public mental health, particularly for pregnant women, is a significant concern (Wang et al., 2020).

Researchers discovered that the pandemic impacted mental health conditions such as stress and anxiety (French et al., 2020), but the underlying mechanisms were unknown. Several theoretical concepts could be used to determine what elements influence mental health during a pandemic. The protection motivation theory, developed by R.W. Rogers in 1975, is one example of a health behavior theory (Rogers, 1975).

The COVID-19 pandemic, according to this idea, may trigger the threat-appraisal and coping-appraisal processes (Rogers, 1975). The general people would be confused and concerned about physical signs that resembled COVID-19 illness. They would be worried that they did not have sufficient health information to protect themselves due to the possible threat and impact of the pandemic (Wang et al., 2020).

For the coping-appraisal process, a person would look for health information to better understand the pandemic and take precautions to avoid becoming infected (Velde & Pligt, 1991). According to the information buffer theory, health information can act as a buffer against physical symptom threats, reducing anxiety and stress (Wang et al., 2020).

Conversely, an excess of health information, particularly inaccurate and misleading information, may harm mental health. Based on infectious diseases (Amanzio et al., 2020), a study provided a theoretical framework to explain the relationship between health information, the psychological impact of a pandemic, physical symptoms, and mental health outcomes (Amanzio et al. 2020).

During the COVID-19 pandemic, conflicting and inaccurate health information, such as contradictory advice on face mask use, could lead to negative thinking and expectation, resulting in the nocebo effect (Amanzio et al.,2020) and, ultimately too, adverse mental health outcomes (Wells & Kaptchuk, 2012). In conclusion, physical symptoms resembling COVID- 19 infection would trigger a search for health information, affecting the pandemic's perceived impact and, eventually, adverse mental health outcomes such as anxiety and stress (Wang et al., 2020).